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**WEST BANK AND GAZA AVIAN AND HUMAN INFLUENZA PREVENTION
AND CONTROL PROJECT**

**ENVIRONMENTAL ASSESSMENT
AND ENVIRONMENTAL MANAGEMENT PLAN**

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Abbreviations

AI	Avian Influenza
AICEP	National Avian Influenza Control and Eradication plan
NCAIC	National Committee on Avian Influenza Control
CP	Contingency Plans
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EQA	Environment Quality Authority
FAO	Food and Agriculture Organization
FIDIC	International Federation of Consulting Engineers
GPAI	Global Program on Avian influenza
HEPA	High efficiency particulate air
HPAI	Highly Pathogenic Avian Influenza
H5N 1	Avian Influenza A-type virus
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
MOA	Ministry of Agriculture
MOH	Ministry of Health
OIE	World Organization for Animal Health / International Office of Epizootics
PA	Palestinian Authority
PARC	Palestinian Agricultural Relief Committees
PIU	Project Implementation Unit
PPE	Personnel Protective Equipment
RRCT	Rapid Response and Culling Team
TFAI	Task Force on Avian Influenza
UV	Ultraviolet light
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
UNTF	Avian Influenza Prevention and Control Project financed under the Avian and Human Influenza Facility Trust Fund Grant and implemented through the UN System
WB	The World Bank
WBG	West Bank and Gaza
WHO	World Health Organization

1. Summary

In response to the Avian Influenza threat to humans and poultry the World Bank has launched a global Program for Avian Influenza and Human Pandemic Preparedness and Response. The World Bank is supporting the Palestinian Authority to address challenges posed by the current Avian Influenza (AI) outbreak and the possibility of a human flu pandemic. A requirement of the World Bank is to conduct an environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable.

An environmental management plan studies each project activity, consider the impact of these activities on the environment, and then outlines what mitigation measures should be taken to prevent the negative environmental impact of each activity. Afterwards, the plan indicates which institution will implement mitigation measures and which institution will monitor the implementation. In addition, the plan identifies the cost of mitigation and monitoring measures. The plans purpose it not to prepare procedures or manuals, however identifies the necessary procedures and manuals and that need to be developed to prevent and/or minimize the environmental hazards.

Activities that will be conducted under Human Health and Animal Health components of the project are not expected to generate significant negative environmental impacts. Most of these activities are focused on improving the readiness of the public sector to deal with domestic poultry and potential human pandemic. The main areas of environmental risks from the project activities are the inadvertent spread of the AI virus during culling, transport, and disposal of carcasses, animal waste, liter, and used protective gear, contamination of surface and groundwater fro use of disinfectants and laboratory biosafety and waste management. In addition, minor environmental disturbances may occur during renovation of laboratories. Most of these impacts could be avoided or minimized as described in the mitigation measures.

The main recommendation presented in the EMP report include:

A- General recommendation to develop the legal setting (for details check section 3.3.15.):

- 1) To develop regulation on animal carcasses disposal that have died or were killed following a pathogenic infection.
- 2) To develop the regulations and bylaws on the bio-security for farms and hatcheries by MOA.
- 3) To finalize and submit the hazardous waste regulations and the medical waste regulations.
- 4) Clarify roles of EQA and MOH regarding hazardous waste management.
- 5) To identify a mechanism for ministries to be able to supervise and monitor other ministries' activities that affect their line of work
- 6) To work on approving the Quarantine bylaw drafted by the Ministry of Agriculture

- 7) To draft a bylaw on animal diseases by MOA.

B- Main recommendations to develop the Institutional Setting and Reporting mechanism

- 1) To translate the two plans of the Ministry of Agriculture and the Ministry of Health into one operational plan that include both ministries as well as the Environment Quality Authority, and that the operational plans include standard operating procedures for each step, and identification the role of each ministry / authority in these procedures. It is recommended that these operational plans would include not only positions of responsible persons, but also names of personnel and their contact numbers at all levels, starting from the ministerial level -represented by the NCAIC - and ending with local or governorate level for all stages of operation.
- 2) To include an EQA member in the RRCT to ensure that site selection of burial site and that the disposal method are conducted in an environmentally sound manner and in accordance with the EMP. (this recommendation has already been addressed). Now the RRCT include a member of EQA as agreed upon in written communications between the two institutions during the plan preparation.
- 3) RRCT will monitor all activities related to culling, transport and disposal of carcasses and waste, as well as the use of disinfectants.
- 4) It is recommended to improve the reporting system to include environmental reporting. The following forms are suggested:
 - a. For the health forms, it is recommended to include 1) records about workers and supervisors at the site, 2) their health status, 3) vaccination, 4) past health history, and 5) use of PPE.
 - b. For the environmental forms it is recommended to include 1) the location of the burial pit, 2) the disposal operations, 3) the factors considered in the site selection process, 4) its preferred if the site is also identified by GPS to add on a map, 5) water sensitivity, 6) dimensions of the burial site, and 7) site marking information. A copy of the environmental form should be given to EQA, MOH-Environmental Health department, and the Ministry of Local Government and the Water Authority.
- 5) The Environmental Specialist hired by the Project Implementation Unit will monitor waste management at the MOA and MOH laboratories and report on compliance with the Mitigation measures indicated in the EMP. The environmental specialist should give a copy of his/her observations and recommendations to EQA and MOH / Environmental Health Department.

**C- Main recommendations on Mitigation Measures on Animal Health Component:
Culling and disposal:**

- 1) To upgrade the current guidelines for culling, transport and operation to include the recommendations presented for each step in these guidelines. (See page X for details)
- 1) To develop the Standard Operating Procedures for culling, transport and disposal as soon as possible.
- 2) To Train the RRCT on these procedures.

Strengthening the surveillance capacity

- 1) To develop biosafety manual for MOA laboratories.
- 2) To develop waste management manual for MOA laboratories.
- 3) To train laboratory technicians on biosafety.
- 4) To provide the necessary equipment to improve the biosafety of the laboratory, including an autoclave, an incinerator or a disposal method for carcass from laboratories, and other equipment required to reach the safety biosafety levels 2 and 3, such HEPA filter, ultraviolet lamps....etc.

Chemicals use:

- 1) Use of chemicals according to code of conduct and procedures.
- 2) Selection of chemicals in coordination with EQA to prevent the use of environmentally persistent chemicals.
- 3) To include a list of chemicals that will be used in the contingency plan.

D - Main recommendations on Mitigation Measures on Human Health Component

- 1) To prepare operational manual for waste management produced from the MOH laboratory
- 2) to equip the laboratory with any required equipment to reach the biosafety level 3
- 3) To equip the laboratory with any required equipment to be able to implement acceptable waste management practices.

The EA Report has reviewed a number of entity laws, including the Basic Palestinian law, the Public Health law, the Agricultural Law, the Environmental Law, the Water Law, the Poultry Farms bylaw, the Poultry Hatcheries bylaw, the bylaw for licensing poultry and animal farms, Regulations on Animal disease, and Oslo Agreement II. The EA report further proposes monitoring activities and responsible institutions for monitoring of each mitigation measure.

A possible outbreak of AI in West Bank and Gaza would require an organized and systematic response. This means that a number of different sectors would need to work in coordination, and that the flow of information and action plans would need to be developed together. One of the most important steps that have been taken is the establishment of the National Committee on Avian Influenza Control (NCAIC). This committee facilitated proper planning and coordination of work among the most important stakeholders, such as the Ministry of health, the Ministry of Agriculture, and the Environment Quality Authority among others.

2. Project Description

The emergence of highly pathogenic avian influenza epidemic (HPAI) has placed the West Bank and Gaza at high risk due to the large number of migratory birds, with increased risk to spread the infection among domestic poultry. The proximity of outbreaks in Israel, Egypt and Jordan increases this risk if it is not handled in an efficient and rapid mechanism. On April 20, 2006, AI H5N1 presence was confirmed in 8 locations in Gaza according to the Food and Agriculture Organization of the United Nations (FAO) and World Health Organization (WHO) reports. In 2006, preventive culling in Gaza took place of about 400,000 in 45 farms and no human out break was

reported. There were also nine outbreaks in poultry coops in Israel between 16th and 31st of March 2006¹. Five of the outbreak cases were at the border of Gaza Strip, one close to the Egyptian border, one nearby Jerusalem, and one in the northern Jordan Valley near the Israeli Jordanian borders¹. The number of culled birds during these outbreaks was about 1.2 million¹.

The World Bank (WB) has launched a global Program for Avian Influenza (GPAI) and Human Pandemic Preparedness and Response². Under this framework, the World Bank supports client countries to address challenges posed by the current AI outbreak and the possibility of a human flu pandemic³. The United Nations Development Program (UNDP/PAPP) with funds from the World Bank and technical assistance from FAO is assisting the Palestinian people in preparing an emergency operation in response to Avian Influenza (AI) threat in West Bank and Gaza (WBG).

Consistent with the GPAI, the project development objective is to minimize the threat posed to humans and domestic poultry by HPAI infection, as well as to prepare for control and respond to influenza pandemic, including minimization of the loss of income through compensation.

Project region: The project operation will take place throughout the West Bank and Gaza Strip, as it is possible that the threat will affect all the country.

The following components are covered in this project:

1. Component 1: Animal Health and Veterinary Services
2. Component 2: Human Health Component
3. Component 3: Public Awareness and Environmental Management

Component 1: Animal Health and Veterinary Services

This component is composed of three sub components: (1) surveillance and diagnostic capacity; (2) culling and disposal; and (3) compensation for income loss. The following activities are to be conducted within the framework of each sub-component.

Sub-component 1.1: Surveillance and Diagnostic Capacity

Activities include (a) training of field staff on surveillance and monitoring; (b) provision of personal protective equipment (PPE) for field technicians directly exposed to the risk of contamination during surveillance; (c) vaccines; (d) equipping of a veterinary laboratory in Gaza including supply of reagents and laboratory disposables, as well as the upgrading of the capacity of the existing laboratory in the West Bank; (e) training for lab technicians; (f) and some activities in community awareness and social mobilization (mainly targeted at persons along the poultry production line). Potential activities may

¹ Leventhal, A., Ramlawi, A., Belbiesi, A., Balicer, R. D (2006). Regional collaboration in the Middle East to deal with H5N1 avian flu. *BMJ* 333: 856-858.

² <http://www.imf.org/external/pubs/ft/afp/2006/eng/022806.htm>

³ Global Program for Avian Influenza Control and human pandemic preparedness and response. Interim Guidelines for Managing potential Environmental and Social safeguard issues in Bank-Assisted Avian Influenza Control Projects (April 2006). Page 6

also include the provision of appropriate quarantine measures and the development of a routine collection and update of epidemiological data.

Sub-component 1.2: Culling and Disposal

This sub-component will support culling and disinfection of disposal sites and poultry farms, as well as the provision of technical assistance to PA counterparts on culling procedures and data collection.

Sub-component 1.3: Compensation for Income Loss

This component will provide technical support for the compensation committee and a proportion of the compensation funding. All the necessary legal, operational and institutional arrangements for carrying out this sub-component will be developed in the first few months of implementation through the AITF grant to UN agencies (UNTF Grant).

Component 2: Human Health Component

This component will support activities aimed at preventing the spread of the AI virus to humans and will cover the following three sub components: 1) prevention and human safety; 2) strengthening public health surveillance systems; 3) strengthening health system response capacity.

The following activities are to be conducted for each subcomponent

Sub-component 2.1: Prevention & Human Safety

This component will support (a) the protection of medical and field staff and other highly exposed groups involved in identification/surveillance of the disease. Adequate resources will be allocated for PPE, Prophylaxis treatment, disinfection materials, and vaccination against seasonal human influenza; and (b) social mobilization and raising public awareness in the community.

Sub-component 2.2: Strengthening Public Health Surveillance Systems

To assess risks to public health and to guide preventive interventions, information is needed on the extent of influenza infection in animals and humans, on circulating viruses, and on other priority infectious diseases. To this end, the project would support strengthening the capacity of existing laboratories. This will include the provision of equipment necessary for specimen collection, transportation, and testing. It will also support upgrading of the diagnostic capacity of existing laboratories.

Sub-component 2.3: Health System Response

While precise figures are difficult to estimate, the burden on the health system is likely to be considerable. With the present situation, the potential of the HPAI virus to become transmissible among humans is of serious concern. Thus, building an effective national public health response would be part of an integrated national plan to bring proven interventions quickly up to a nationwide scale. Activities under this sub-component will include: 1) **Vaccinations:** In the event of an avian influenza pandemic (when vaccines become available), funding will be made available for implementing a detailed logistical

(procurement and distribution) plan for the vaccination of targeted priority groups. 2) **Drug Therapy:** The use of anti-viral drugs will be part of the approach to contain an avian influenza pandemic and to reduce morbidity and mortality. Therefore, support will be provided for the purchase of Tami flu (antiviral drug). Priority would be given to population groups most exposed to immediate risk. The project would support the use of the anti-viral drugs for: (a) post exposure; and (b) extended prophylaxis. 3) **Medical services:** Based on the needs assessment which will be conducted under the UNTF Grant, assistance will be provided to the health care system for preparedness to provide optimal medical care and maintain essential community services. Strengthened clinical care capacity could be achieved through establishing specialized units in selected hospitals.

Component 3: Public Awareness and Environmental Management

Current assessments indicate there are at least two areas of activity where contingency funds will need to meet evolving needs: (a) further activities on public awareness and information which may have not been addressed under components 1 & 2; and (b) implementation of an environmental management plan (EMP).

Sub-component 3.1 Public Awareness and Information

A coordinated awareness and information campaign is needed to target the general public, especially the rural population and areas of common backyard poultry breeding (high-risk areas). Some public awareness activities will be carried out under Component 2 with oversight from the Ministry of Health (MOH). The Ministry of Agriculture (MOA) also plans to print out and distribute leaflets and brochures (under Component 1) targeting poultry producers. Additional activities not accounted for under Components 1 and 2 will be financed under Component 3. The Project Implementation Unit (PIU) will retain a communications specialist/agency to prepare a public awareness strategy in consultation with key UN agencies and NGOs (UNICEF, PARC, etc).

Sub-component 3.2 Implementation of Environmental Management Plan

This sub-component will implement measures as described in this EMP after its approval. This plan is developed as part of the activities under the UNTF. The EMP is developed following the “Interim Guidelines for Managing Potential Environmental and Social Safeguard Issues in Bank-Assisted Avian Influenza Control Projects”, Quality Assurance and Compliance Unit, April 2006.

3. Overview of Applicable International and National Agreements, Policies and Laws

3.1 World Bank Safeguards Policy

The World Bank requires environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making. EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project’s potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or

compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. The Bank favors preventive measures over mitigatory or compensatory measures, whenever feasible.

The World Bank classifies the proposed projects 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 West Bank and Gaza Avian and Human Influenza Prevention and Control Project has been assigned environmental category B, since it involves moderate environmental impacts that can be managed during implementation of the project. The EA process for the AI project is addressed through this EMP. This EMP addresses the moderate adverse environmental effects of the Animal Health and Human Health Project Components.

For the Animal Health component, the EMP addresses zoonotic disease containment and waste management as pertain to special waste, emissions and materials at laboratories, and training for veterinary services workers, to include procedures for safe handling of AI materials; safe culling of infected and at-risk poultry and disposal of carcasses. For the Human Health component, the EMP focuses on equipment, refurbishing and training for laboratories and medical facilities to include key environmental issues in zoonotic disease containment and special waste management. The EMP provides a mitigation and monitoring plan to ensure appropriate attention to environmental issues, and tracking progress or problems in their management.

3.2 International agreements

3.2.1) OSLO II - The Israeli-Palestinian Interim Agreement on the West Bank and Gaza Strip⁴

This agreement identifies the coordination mechanism between Palestinian ministries and Israeli side regarding health, environment, and agriculture. In addition, the agreement bids both sides to commit to issuing standards that is compatible with those that are internationally recognized. These standards should be equivalent and compatible between the two sides in the sectors of health, veterinary service and environmental aspects.

⁴ September 28, 1995. Washington, D.C, USA.

A) ANNEX III - Protocol Concerning Civil Affairs - Article 17 -Health

Israel and the Palestinian side shall exchange information regarding epidemics and contagious diseases, shall cooperate in combating them and shall develop methods for exchange of medical files and documents. In addition, a committee shall facilitate coordination and cooperation on health and medical issues between the Palestinian side and Israel. Vaccination should be conducted according to internationally accepted standards while taking into account WHO recommendations.

B) ANNEX V- Protocol on Economic Relations - Article 8 – Agriculture

The relations between the official veterinary services of both sides will be based on mutuality in accordance with the following principles, which will be applied in all the areas under their respective jurisdiction:

- a. Israel and the Palestinian Authority will do their utmost to preserve and improve the veterinary standards.
- b. Israel and the Palestinian Authority will take all measures to reach equivalent and compatible standards regarding animal disease control, including mass vaccination of animals and avians, quarantines, "stamping out" measures and residue control standards.
- c. The official veterinary services of Israel and the Palestinian Authority will coordinate and regularly exchange information regarding animal diseases, and will establish a mechanism for immediate notification of the outbreak of such diseases.

The two sides will establish sub-committees of their respective official veterinary, which will update the information and review issues, policies and procedures in these fields. Any changes in the provisions of this Article will be agreed upon by both sides.

C) ANNEX III - Protocol Concerning Civil Affairs - Article 12 - Environmental Protection

Both sides shall respectively adopt, apply and ensure compliance with internationally recognized standards concerning the following: levels of pollutants discharged through emissions and effluents; acceptable levels of treatment of solid and liquid wastes, and agreed ways and means for disposal of such wastes; the use, handling and transportation (in accordance with the provisions of Article 38 (Transportation)) and storage of hazardous substances and wastes (including pesticides, insecticides and herbicides); and standards for the prevention and abatement of noise, odor, pests and other nuisances, which may affect the other side.

3.3 Palestinian Legislation

The following legislations are in effect in the Occupied Palestinian Territory that are related to the AI:

- 1) Basic Palestinian Law⁵:
- 2) Public Health Law⁶: No. 20 for the year 2004.
- 3) Agricultural law⁷: No. 2 for the year 2003, modified in Law No. 11 for the year 2005⁸.

⁵ Official gazette – Palestinian Facts – special issue, July 2002. page 5-48

⁶ Official gazette – Palestinian Facts – April 2005, Page 14-34

- 4) Environmental Law⁹: Law No. 7 for the year 1999 regarding the Environment
- 5) Water Law No. 3 for the year 2002¹⁰.
- 6) Presidential decree to establish National Committee on Avian Influenza Control¹¹ No. 17 for the year 2006.
- 7) Poultry Farms bylaw¹²: Ministerial Cabinet decree No. 12 for the year 2006 regarding poultry farms.
- 8) Poultry Hatcheries bylaw¹³: Ministerial Cabinet decree No. 380 for the year 2005 regarding Poultry Hatcheries.
- 9) Bylaw for licensing poultry and animal farms for the year 2005. (Gaza only)
- 10) a) Regulation on Animal disease No. 39 for the year 1954 (applicable if it does not contradict with other laws in the West Bank)
b) Regulation on Animal disease No. 43 for the year 1945 (applicable if it does not contradict with other laws (Gaza and West Bank).
Both regulations 10 a 10 b are identical from a technical point of view.
- 11) Regulation on animal quarantine (1931) (Gaza Only)
- 12) Regulation on animal diseases: import of poultry. (Gaza only 1931)
- 13) Regulation on animal disease: epizootic diseases (Gaza only). (1928)
- 14) The Palestinian Environmental Impact Assessment Policy (2000)¹⁴.

In addition, a bylaw regarding veterinary quarantine was drafted, although not presented to the Ministerial cabinet yet. This law will be able to replace the laws on animal quarantine and import of poultry 1931 (Gaza) and to fill the gap of lack of such laws in the West Bank. This law will unify the system in Gaza and the West Bank upon approval in that regard. A second by law regarding animal drug use was drafted by MOA, although not presented for approval by the ministerial cabinet yet. This bylaw when approved will control the drug use and their import to the country, including the vaccination of poultry.

There are two bylaws that have been drafted by EQA, a bylaw on solid waste and a bylaw on hazardous waste. However, these bylaws were not submitted to the ministerial cabinet yet for approval. In addition, work is undergoing to finalize a draft bylaw on medical waste.

3.3.1) Basic Palestinian Law¹⁵:

The basic law states (Article 33) that “The enjoyment of a balanced and clean environment is a human right. The preservation and protection of the Palestinian environment from pollution for the sake of present and future generations is a national duty”. Defining clean and safe environment as a human right in the basic law is essential

⁷ Official gazette – Palestinian Facts – October 2003, Page 23-71

⁸ Official gazette – Palestinian Facts – September 2005, Page 8-9.

⁹ Official gazette – Palestinian Facts – February, 2000. page 38-70.

¹⁰ Official gazette – Palestinian Facts , September 2002. page 5-28

¹¹ Official gazette – Palestinian Facts – June 2006, Page 30-32.

¹² Official gazette – Palestinian Facts – June 2006, Page 529-533.

¹³ Official gazette – Palestinian Facts – June 2006, Page 428-432.

¹⁴ Ministerial Council approval in resolution No: 27-23/4/2000.

¹⁵ Official gazette – Palestinian Facts – special issue, July 2002. page 5-48

for the further laws issued on the environment, and for the protection of the environmental systems. Also this article indicates the importance of sustainable development, as the environment has to be preserved and protected for the sake of not only present but also future generations.

In addition, the principle of the rule of law shall be the basis of government in Palestine. All authorities, powers, agencies, institutions and individuals shall be subject to law. This article indicates that all institutions including governmental ministries should abide by laws (Article 6).

3.3.2) Public Health Law¹⁶: No. 20 for the year 2004.

The public Health law assigns the responsibility of combating infectious diseases and epidemics by all means possible to the MOH. In addition, the law gives the ministry the authority to take all necessary and precautionary measures to stop the spread of disease through: 1) imposing vaccinations and needed medications; 2) confiscating and destroying all material contaminated with the disease, or that could be a source of spread of the disease, in coordination with competent bodies; and 3) to bury the dead in the manner the ministry deem fit (Article 10).

The law identifies procedures taken in case of identification of a human case with infectious disease, including isolation, reporting, and free treatment. Also it can impose quarantine measures to prevent the spread of disease. In addition, the ministry could in coordination with the competent bodies do the following 1) medical inspection, 2) isolate and monitor animal, and 3) determination of health conditions that should be available in the exported and imported goods.

Article 42 of the law states that the Ministry shall coordinate with the relevant bodies to determine conditions for:

- A. transfer, storage, treatment or disposal of hazardous items
 - B. usage and exchange of pesticides for agricultural and public health purposes
 - C. collection, recycling or reuse of wastewater and rain water
2. No one is allowed to perform the tasks defined in A, B, and C above unless this person is obeying the rules and conditions determined as indicated in this article.

3.3.3) Agricultural law¹⁷: No. 2 for the year 2003

This law provides the general framework for agricultural practices. It identifies (Article 59) that MOA will draft bylaws to control and organize farms. These bylaws should be approved by the ministerial cabinet to be effective. Based on this law the poultry farms and hatcheries bylaws were issued. The Agricultural law also provides general framework for animal diseases control (Chapter 4).

Based on this law (Article 63) any owner of animals should isolate animals suspected with disease, and immediately report to the closest veterinary department. The law also does not allow the trade of diseased animals and those that are suspected to be infected with

¹⁶ Official gazette – Palestinian Facts – April 2005, Page 14-34

¹⁷ Official gazette – Palestinian Facts – October 2003, Page 23-71

epizootic diseases. Article 65 of the law, forbids discarding dead animals in the open, or in public places, and should be disposed off based on the regulations that will be set by MOA, and in coordination with respective ministries and authorities away from water resources. However, these regulations were not issued yet. The law gives the authority to the minister to issue regulations targeting the following (Article 65):

- 1) Provide a list of infectious animal diseases and epizootic diseases, and methods to prevent occurrences of such diseases, and procedures to prevent spread of these diseases
- 2) Procedures required to control sick animals, their treatment or culling.
- 3) Owners of farm are obligated to register and vaccinate their animals at locations assigned by the Ministry.
- 4) Vaccination of animals and disinfection of farms periodically:
- 5) The minister can announce an area contaminated with a certain disease and take appropriate measures.
- 6) Organize and control the isolation and quarantine of sick animals
- 7) Provide a list of diseases that are common to both human and animals, and methods to control these diseases in coordination with appropriate institutions.

3.3.4) Environmental Law¹⁸: Law No. 7 for the year 1999 regarding the Environment

This law identifies waste, hazardous materials, and hazardous waste. It is also based on the polluter pays principle. Although the law does not indicate that culled animals due to an infectious disease and their waste as hazardous waste directly, it however implies that these waste are considered hazardous. The definition of hazardous waste based on this law is: any waste generated by the various activities and operation or the ash thereof which preserve the characteristics of hazardous substance, where hazardous substance is defined as any substance or combination of substances, which because of its hazardous characteristics poses a danger on the environment as toxic, radioactive, biologically infectious, explosive or flammable substances. Culled animals due to an infectious disease and their waste are biologically infectious material, therefore are regulated under the environmental law, and the disposal method of this waste should be approved by EQA. Also, this law identifies (Article 12) that handling hazardous waste, should be in accordance to terms, regulations, instructions and norms specified by EQA in coordination with specialized agencies. Therefore, transport, storage, use, treatment and disposal of culled animals and their waste, should be according to these norms and regulations. However, these norms and regulations are not issued yet, therefore, it is subjective to the opinion of the EQA employees.

3.3.5) Water Law No. 3 for the year 2002¹⁹.

The law gives the Water Authority the right to consider any area as a conservation area if this area poses a threat on the groundwater resources (Article 31). In addition, the Water Authority has the right to inspect any site that is suspected to cause water pollution. The law is based on polluter pays principle (Article 32).

¹⁸ Official gazette – Palestinian Facts – February, 2000. page 38-70.

¹⁹ Official gazette – Palestinian Facts , September 2002. page 5-28

3.3.6) Presidential decree to establish National Committee on Avian Influenza Control (NCAIC)

On 24 March 2006, the Palestinian authority via a presidential decree (No. 17)²⁰ established the NCAIC. The committee is formed of the following members:

- 1) Minister of Health (Chair)
- 2) Deputy Minister of Agriculture (Deputy – Chair)
- 3) Deputy Minister of Finance
- 4) Deputy Minister of National Economics
- 5) Deputy Minister of Civil Affairs
- 6) Coordinator of the Governorates' Affairs
- 7) Representative of the Environment Quality Authority (EQA)
- 8) Representative of the Association of Poultry Growers
- 9) Representative of the Palestinian Agricultural relief committees (PARC)

The main responsibilities of the NCAIC are:

- 1) Take preventive measures to minimize the spread of the disease between birds according to international standards.
- 2) Take preventive measures to prevent the cross transfer of disease from animal to human according to international standards
- 3) Take necessary quarantine and treatment measures in the areas with pandemic in the case of transfer of the disease to humans.
- 4) Management of the awareness programs regarding AI.
- 5) Take necessary measures to control the movement of people and products related to the AI.
- 6) Take necessary measures regarding the import and export of products related to the AI.
- 7) To deal with the economic consequences of the spread of disease between birds and its transfer to humans.
- 8) Provide necessary funds and set up a plan for compensation.
- 9) Follow up the implementation of decisions taken by the committee in coordination with technical and security institutions.
- 10) Coordinate with neighboring countries as well as international bodies the technical and financial assistance.

3.3.7) Poultry Farms bylaw

This bylaw identifies that the definition of a farm is any farm in which poultry production is practiced according to certain technical standards, whether it has natural ventilation (open), or forced aeration and that the size of the farm is more than 300 meters square. Therefore, this bylaw does not take into consideration the small scale farms. This by law identifies that each farm to be licensed requires that the farm is following bio-security regulations issued by the ministry of Agriculture. However these bio-security regulations not issued yet, in addition farms has very low bio-security measures in the farms.

²⁰ Official gazette – Palestinian Facts – June 2006, Page 30-32

The bylaw identifies that in case a disease has been identified in a farm, the Veterinary services and Animal health department has to be immediately informed, so they can take samples and follow appropriate procedures according to results of the laboratory tests.

3.3.8) Poultry Hatcheries bylaw

This bylaw states that each hatchery should be licensed, and the requirement for obtaining this license is to follow the bio-security regulations issued by the Ministry of Agriculture. However these bio-security regulations are not issued yet. Also the by law identifies that in case a disease has been identified in a farm, the veterinarian services to be immediately informed, so they can take samples and follow appropriate procedures according to results of the laboratory tests.

3.3.9) Bylaw for licensing poultry and animal farms for the year 2005 (Gaza)

This bylaw defines additional regulations regarding the location of farms in Gaza. This law complements the agricultural law, as it clearly indicates that any licensing of a farm should be according to procedures and regulations issued by the MOA. So it is a complementary bylaw to define areas in which farms are permitted in Gaza. This bylaw is applicable only to Gaza Strip.

3.3.10 A and 10 B) Regulation on Animal diseases

There is no actual difference between these two regulations; they are identical in terms of their articles with the difference of the authorities, between the Jordanian and British Mandate Authority. Otherwise from technical point of view the laws regulate the actions during animal epizootic. Law No. 43 (1945) issued by the British mandate is valid in both Gaza and the West Bank as long as it does not contradict with other laws. However Law No. 39 for the year 1954 issued by the Jordanians and valid only in the West Bank as long as it does not contradict with other laws. Considering that it has not issued any bylaws to define the procedures for animal disease in Palestine, the procedures in these laws are still valid, with regards to how to deal with an epizootic disease, starting from reporting, quarantine within the farm, disinfection, culling and disposal. These two by laws identify how to deal with a potential animal epizootic. Also it identifies the link with the Ministry of Health in case diseases are transferable to humans at the district level.

In case of an epizootic the owner should inform the official governmental veterinarian, who will in his/her turn inform the veterinary service department at MOA. This official governmental veterinarian might take isolation measures for the animals and siege the area. Then this official governmental veterinarian has to report this to the veterinarian department at the ministry, which in turn if convinced to be true, would report to the minister. When animals die due to disease, the official governmental veterinarian can issue instructions to dispose the carcasses, as well as the bedding, manure, feed...etc.

The official governmental veterinarian is allowed to take samples for laboratory analysis, also has the authority to treat the infected animals. The official governmental veterinarian has the authority to order disinfection of the farm. He/she has the authority to prevent trade of animals to prevent the spread of the disease. Also the official

governmental veterinarian has the authority to enter any facility that has animals, including any transportation means.

If necessary, culling and disposal of carcasses, bed, manure and contaminated feed should be conducted. The disposal can be conducted by the farmer on own land, or public land that does not have a fence. Also disinfection of the disposal area should take place. If culling is seem necessary then the law identified compensation mechanism.

In case of identification of a farm with zoonotic disease a written document that identifies the quarantine area is issued by the veterinary services and the following rules are in effect:

- 1) Animal movement is not allowed without a special permit from the veterinarian services.
- 2) All animals have to be away from the public roads.
- 3) Veterinarian service can ask the owner of the farm to isolate animals.
- 4) No person shall leave the area, unless has already followed all instructions regarding prevention of disease spread that might be issued by the official governmental veterinarian.
- 5) If an animal dies due to a disease, then either it can burned immediately, or buried at a depth of at least 2 meters.
- 6) Nothing that has been used by the dead animal can be transported outside the area, unless special permit is given by the veterinary department.
- 7) If the disease is transferred to humans, the veterinary services have to immediately report to the nearest official health department.

3.3.11) Regulation on animal quarantine 1931.

This regulation controls the movement of animals and the procedures required for import and export of animals, including testing, health certificate, quarantine until proven to be safe to import...etc.

3.3.12) Regulation on animal diseases: import of poultry. (Gaza only 1931)

This regulation adds only minor details to the animal quarantine, however specific to the poultry import. It also indicates the disposal of manure bedding and feed that has been in contact with poultry at the transportation. It also indicates that if a disease is inspected in the imported poultry it should be either burned or buried.

3.3.13) Regulation on animal disease: epizootic diseases among poultry (Gaza only 1928).

The law forbids trade in poultry that are infected with zoonotic disease. Also its transport of these poultry is not allowed.

- 1) Every infected or suspected to be infected bird has to be culled and disposed by either burning or burying.
- 2) Every bird that has been in contact with a suspected bird will be culled or isolated, depending on the official governmental veterinarian opinion that the birds can be isolated.

- 3) For two months, no birds can be placed in the infected farm area.
- 4) All areas, in which the bird was in contact, has to be disinfected, including all utensils, feed, saw dust. The disinfection cost should be paid by the farm owner.
- 5) All manure as well as any feed or bedding that has been in contact with the bird will be immediately disposed off by either: 1) burning, or 2) burying in ground with quicklime.

In addition, procedures for cleaning and disinfection are clearly identified in this bylaw; these include the way of cleaning, and disinfection materials to be used. The disposal of culled and dead animals should be conducted by village council either by burning or burying at a depth of one meter or burn it at the expenses of the farm owner. This bylaw prevents the movement of birds to and from the contaminated farm, including making sure those birds do not leave the premises and that they are properly fenced.

3.3.14) The Palestinian Environmental Impact Assessment Policy

This policy defines the activities subject to an Environmental Impact Assessment (EIA), basic principles underling the policy, responsibility for implementation, the reviewing committee for EIA, stakeholder consultation...etc.

3.3.15 Recommendations for improving the regulatory setting with regards to Avian Influenza²¹

1) Regulation on animal carcasses that have died or were killed following a pathogenic infection, need to be established. It is suggested that the regulation if developed should have more than one method of disposal, as some of animal diseases are not decontaminated by burial and would require burning or some form incineration. Several methods for safe disposal of these carcasses are known internationally and can be adapted to the local conditions. The regulation should include a specification of land reuse of the disposal site if done by burial, and marking and labeling of the site. The perception of some officials of the MOA is that the land would be safe for reuse for agriculture or other developments after a short period of time. However, other countries have issued regulations that do not allow the reuse of land for 10 years. In a country like Palestine where land is limited there should be a time frame identified that is both safe and practical for the reuse of land. For project implementation, the procedures for culling and disposal that will be developed as part of the UNTF project can substitute the lack of these regulations with regards to Avian Influenza. The culling and disposal procedures can also form the basis for drafting the recommended by law. Expected date of completion of these procedures is April 2008.

2) Develop the regulations and bylaws on the bio-security for farms and hatcheries by MOA. Until these regulations are developed, the MOA is recommended to use the OIE biosecurity regulations. It is recommended that MOA develop these bylaws as soon as possible. If this cannot be achieved due to lack of resources, Veterinary Service and Animal Health department at MOA should adapt OIE biosecurity guidelines for farms as part of the licensing and inspection procedure.

²¹ It is very difficult to estimate a time period for these recommendations given the current instability of the country.

- 3) Finalize and submit the hazardous waste regulations and the medical waste regulations. Both regulations will give handling procedures for laboratory waste disposal for both the Ministry of Agriculture, and the Ministry of Health. Currently, work is undergoing to draft the Medical waste regulations or by laws as part of the Medical Waste Project at UNDP. Considering that the process of drafting and approving bylaws from ministerial cabinet is a lengthy process, waste management manuals will be developed for MOH and MOA laboratories to ensure that waste management practices would comply with international standards until local standards and bylaws are issued. These manuals should be developed as early as possible in the project.
- 4) There is a need to have an agreement on the ministerial level or within the Ministerial cabinet on the roles of EQA and MOH regarding waste management, including hazardous, and medical. As the law on environment gives this responsibility to EQA, while the Public Health law gives it to the Ministry of Health. This has created un-clarity and conflict in the role of these institutions regarding the hazardous waste management. Currently meetings are taking place between the two institutions to agree on a work plan regarding hazardous waste management and to clarify the roles of the two institutions on the issue. A legal advisor that is hired by Medical Waste Project at UNDP/PAPP is working on this issue with the two institutions. Expected date for finalizing of the work of the legal advisor December 2007 that will include the final draft of the medical waste bylaw. Until an agreement is reached, the environmental specialist that will be hired by the project implementation unit will ensure that all mitigation measures are implemented according to this EMP and will report to both institutions²².
- 5) There is a need to identify a mechanism for ministries to be able to supervise and monitor other ministries' activities that affect their line of work. Currently, there is a common understanding that no ministry monitors other ministries' facilities; and any monitoring is done by a committee from within the ministry itself. Being a governmental facility, should not waive the authority of other ministries or authorities to monitor these facilities with regards to their work. As indicated in the basic law, each institution should abide to the law, the question remains, why do not relevant ministries monitor the implementation of laws in the governmental sector. This is a recommendation on the national level, and should be considered by the legislative council and is beyond the scope of this project. The existence of the NCAIC will ensure that coordination and cooperation between the different institutions is taking place, including MOH, MOA and EQA. In addition, the only task that would require monitoring from one ministry or governmental agency to another is related to hazardous waste management, and this will be addressed as indicated in recommendation no. 5 above.
- 6) Work on approving the Quarantine bylaw drafted by the Ministry of Agriculture.
- 7) Drafting a bylaw on animal diseases that can replace the laws issued in 1945 and 1954 as the specifications indicated in these laws are outdated. The current guidelines and plan regarding AI issued by the MOA addresses issues covered in the animal diseases by laws with regards to Avian Influenza. This plan is presented in section 4.

²² The two institutions believe that hazardous waste management is within their responsibility, which means that the monitoring will be conducted twice rather than not being done at all.

3.4 WHO and FAO/OIE Guidelines

FAO and OIE in collaboration with WHO had a strategy to minimize the global threat and risk of HPAI in both humans and poultry, through progressive control and eradication of HPAI, particularly caused by H5N1 virus. The strategy would be implemented on three phases; immediate short term (1-3 years), short to medium term (4-6 years); and medium to long term (7-10 years). The spread of H5N1 will have progressively controlled in domestic poultry of infected countries, and prevented from affecting countries that are not affected, however at high risk. The strategy originally prepared to control HPAI in Asia is being revised by FAO and OIE to take into account the current spread on the disease outside Asia. The strategy will be complemented by more detailed country specific HPAI control plans. FAO/OIE have also issued specific recommendations for avian influenza and OIE has recently issued recommendations for each region, in addition to its standards and guidelines provided for the prevention and control of HPAI in animals. The summary of the strategy of FAO/OIE is presented in Annex 1.

The Recommended Strategic Action plan prepared by WHO for Responding to the Avian Influenza Pandemic Threat lays out activities for individual countries, the international community, and WHO to prepare for a pandemic and mitigate its impact. The objectives of the plan correspond to the opportunities and capacities to intervene and are structured in three phases: (i) pre-pandemic – supporting the FAO/OIE’s control strategy; increasing collaboration between animal and health services; strengthening Strengthen the early warning system, (ii) emergence of a pandemic – containing or delaying spread at the source - and (iii) pandemic declared and spreading internationally – reducing morbidity, mortality and social disruption; conducting research to guide response measures. WHO has also prepared a global plan and guidelines for pandemic preparedness and is in the process of developing a model country plan that will allow countries to assess their state of preparedness and identify priority needs. The summary of WHO guidelines is presented in Annex 2. In addition to the WHO guidelines, the International Health Regulations are being adapted by the Ministry of Health. A brief of these regulations is presented in Annex 3.

4. Institutional setting

As described in the laws above there are three major governmental bodies that have responsibilities related to the Avian and Human Influenza Prevention and Control Project; Ministry of Health, Ministry of Agriculture, and the Environment Quality Authority. Ministry of Health is the main health care provider in Palestine. MOH has the regulatory responsibility of the Health system. The Ministry of Agriculture is the regulatory body for veterinarian services and animal health; it also provides veterinary services at the governorate levels. The EQA is the regulatory authority for environmental issues. It also holds the responsibility of implementing the environmental law in cooperation with other agencies to ensure that the environment is protected for current and future generations. The EQA requires that major agricultural projects should undergo an environmental impact assessment. Also the EQA has the authority to enter and inspect any facility that is suspected to pose negative threat to the environment.

Cooperation between these three governmental entities is essential to respond to a possible outbreak in AI. The establishment of the NCAIC was critical to improve coordination and flow of information among these institutions at the central level. On the governorate level, a committee that is chaired by the governor was established. The members of this committee are the MOH, MOA, EQA, Ministry of Public Works, and Ministry of Local Government. The role of this committee is to facilitate the work of the Rapid Response and Culling teams that will be supervising the actual culling and disposal. Box 1 describes the Rapid Response and Culling teams members and responsibilities. There are 12 RRCT in the West Bank, in Gaza strip these teams are not yet established, but it is expected to have 5 teams. There are four coordinators in the West Bank for these teams. In addition to this level, there is Task Force on Avian Influenza at MOA that mobilizes the teams. The members and tasks of this task force are shown in Box 2. There are two task forces at the Ministry of Agriculture, one in Gaza Strip, and the other in the West Bank. Annex 4 shows the current institutional setting and the mechanism of response of the MOA to the AI outbreak. The mechanism to respond to AI as documented in Annex 4 include the type of information and forms that need to be filled and reported. It is **recommended** that additional forms to be filled for the health and environmental issues. For the health forms, it is recommended to include 1) records about workers and supervisors at the site, 2) their health status, 3) vaccination, 4) past health history, and 5) use of PPE. As for the environmental forms it is recommended to include 1) the location of the burial pit, 2) the disposal operations, 3) the factors considered in the site selection process, 4) its preferred if the site is also identified by GPS to add on a map, 5) water sensitivity, 6) dimensions of the burial site, and 7) site marking information. A copy of the environmental form should be given to EQA, MOH-Environmental Health department, the Ministry of Local Government, and the Water Authority.

Box 1: Rapid Response and Culling Teams (RRCT) – MOA

Members:

- 1) Director Veterinary Department – Chairman
- 2) Head of poultry Section within the District of Agricultural Department
- 3) Any other local staff (one or more) would be nominated by the Director of Veterinary Service and Animal Health
- 4) In addition to the representatives of the relevant stakeholders at the governorate level (Recommendations to include EQA employees to help in site selection and monitor disposal process in a sound environmental manner was suggested during the consultation about this plan, and already agreed upon by the Ministry of Agriculture and EQA for the West Bank). The previous experience in Gaza indicates that the culling teams (although were not named as such) included EQA.

Roles and responsibilities:

- 1) identifying the infected farms and disposal sites;
- 2) setting out a date and pre-informing farmers
- 3) undertaking culling according to the international standards
- 4) Signing and approving the culling forms
- 5) Keeping one copy of culling at the Veterinary Service and Animal Health Department

- 6) Following up all the instructions given by the AIHNCC
- 7) Coordinating the culling process with team members
- 8) Any other needed activities

Box 2: Task Force on Avian Influenza at MOA

Roles and responsibility: it is located within the Ministry of Agriculture, General Directorate Services and Animal Health, and is responsible of:

- 1) Directing the operational component
- 2) Monitoring the spread of the disease and
- 3) Coordinating with Israeli counterpart.

Members: officers within the Ministry of Agriculture, General Directorate of Veterinary Services and Animal Health.

During the previous outbreak in Gaza, the culling teams' concept was not established. Nevertheless, the cooperation and division of tasks between the different institutions was very successful, and it is recommended that this task distribution is followed in the future (Box 3).

Box 3: previous experience in Gaza Governorate, the responsibilities of different stakeholders in the culling and disposal²³:

- 1) The governorate of Gaza with the EQA will choose the burial site and supervise its lining, the burial and disposal of carcasses based on environmental standards. The governorate will provide the logistical support.
- 2) The Ministry of Agriculture will supervise the culling process and its transfer to the disposal site safely, and provision of the plastic and lime and the formalin²⁴ to disinfect the site of work.
- 3) The Ministry of Health provides Tamiflu vaccine and supervises the safety of workers and farmers and surrounding communities.

If a possible outbreak of AI in West Bank and Gaza occurs, it would require an organized and systematic response. This will require that different sectors should work together in a coordinated manner. Therefore, the establishment of the NCAIC has helped in linking MOH, MOA, EQA, and other stakeholders to work together. Although, one committee includes all stakeholders, two plans were issued one by the MOH, and the other by the MOA to respond to the risk of Avian Influenza. The Ministry of Health has issued the Palestinian National Plan for Pandemic Influenza in 2005. For details of the plan see Annex 4. In addition, MOA issued a National Avian Influenza Control and Eradication Plan (AICEP) to support the initiative of the MOH. It is **recommended** that these plans should be translated into one operational plan that include both ministries as well as the EQA, and that the operational plans include standard operating procedures for each step, and identification of the role of each ministry / authority in these procedures. It is recommended that these operational plans would include not only positions of

²³ Technical report of the AI Contingency sub-committee in Gaza Governorate. April 2006.

²⁴ Formalin is a mixture of formaldehyde (40% by volume, 37% by weight), other agent most commonly methanol (6-13%) and the rest is water.

responsible persons, but also names of personnel and their contact numbers at all levels, starting from the ministerial level represented by the NCAIC, and ending with local or governorate level for all stages of operation.

5. Potential Environmental Impacts and Proposed Mitigation Measures

Activities under this project are not expected to generate significant adverse environmental effects as they are focused largely on public sector capacity building and improved readiness for dealing with outbreaks of AI in domestic poultry and potential human pandemic. These prevention focused activities are expected to have a positive environmental impact as the project's investment in facilities, equipment, laboratories, and training for border inspection points and for veterinary and public health services and laboratories will improve the effectiveness and safety over existing AI handling and testing procedures by meeting international standards established. This would be reinforced by mainstreaming of environmental safeguards into protocols and procedures for the culling and disposal animals during AI outbreaks, decontamination of facilities, and laboratory biosafety. In addition, waste management manuals for laboratories will be developed as part of the implementation of this plan according to international good practice guidelines, and training on these manuals will take place to facilitate the management of waste accordingly.

The main areas of environmental risks from the project activities are the inadvertent spread of the AI virus during culling, transport, and disposal of carcasses, animal waste, litter, and used protective gear, contamination of surface and groundwater from use of disinfectants and laboratory biosafety and waste management. In addition, minor environmental disturbances may occur during renovation of laboratories. Most of the key potential impacts could be avoided or minimized as described below by integrating environmental and public health safety aspects in the preparation/design and implementation of project activities.

The following are the Project activities and components that may give rise to potential adverse environmental effects:

(a) *Animal Health Component:*

(i) *Strengthening of veterinary services.* Training of field staff and surveillance and monitoring, equipping of a veterinary laboratory in Gaza as well as upgrading the capacity of the existing laboratory in WB; training for field technicians. The key environmental issues that raise from these activities are those related to zoonotic disease containment, laboratory waste management practices; and investments in improved bio-security;

(ii) *culling and disposal:* This include stamping out by imposing a quarantine area, slaughter of infected and potentially exposed birds, and decontamination of poultry houses, sheds and contaminated areas, and disposal of carcasses and wastes. Improper culling, transport and disposal of contaminated birds, bird products or waste (eggs, manure and feathers) and equipment (for example in open containers) may pose environmental and public health risks.

Human Health Component: Strengthening the capacity of the existing laboratories, and support the upgrading of diagnostic capacity of existing laboratories. The key environmental issues from these activities are related to zoonotic disease prevention and laboratory waste management.

Public Awareness and Environmental Management: No environmental issues, but an important component for design and delivery of communications tools for good hygiene, safe culling and disposal of animal carcasses and animal waste management.

The primary potential risks can be grouped into three categories:

- (a) Inadvertent human exposure and spread of the virus due to: improper culling and disposal of dead birds (wild birds, sick and dead birds from backyard and commercial poultries); lack of, or improper use of personal protection equipment (PPE); improper disposal of farm waste (i.e., bedding, manure, washings, etc. during and/or after an outbreak); and inadequate lab biosafety protocols.
- (b) Inadvertent release of chemicals in the environment from unsatisfactory decontamination procedures (for personnel, poultry sheds, and transport vehicles, etc.).
- (c) Release of chemicals and infectious agents into the environment from inadequate laboratory and medical facility waste management.

Social Safeguards

There are no social safeguards triggered by the project, development of compensation policies to affected poultry owners will contribute to mitigate the effects of losses suffered from HPAI pandemic. The compensation manual has already been developed under the UNTF project and adapted by the PA. This manual was formulated in accordance with the recommendation of the World Bank Task Team Leader. Furthermore the manual was developed according to the guidelines of FAO, OIE, World Bank, and the International Food Policy Research Institute²⁵. The manual and its procedures were customized to accommodate the existing financial system in Palestine, in order to establish its implementation and sustainability. In addition, the compensation manual addresses all poultry growers in the WBG regardless of their size, type, or legal status (licensed or not).

There will be no land acquisition (voluntary or involuntary) under the project, and carcasses of culled birds will only be disposed on public land. Therefore, social safeguard OP/BP 4.12 on involuntary resettlement is not triggered. For backyard poultry operations, the local committee witnessing the culling and the local official governmental veterinarian sign a document stating the carcass deposit area for is public property and free of encroachers/ informal settlements. In case of semi-commercial poultry farms, the zonal veterinarian and an official from the local administration will sign a document stating that the carcass deposit area is public land and free of encroachers/informal settlements.

²⁵ The International Bank for Reconstruction and Development / The World Bank (2006). *Enhancing Control of Highly Pathogenic Avian Influenza in Developing Countries through Compensation: Issues and Good Practice*. Washington, DC

5.1 Mitigation Measures for Animal Health Component

5.1.1. Culling, Transport and Disposal activities shall be carried out in accordance with the procedures defined by the FAO/OIE and the Ministry of Agriculture. Guidelines of the MOA are shown below with recommendations for each step, these guidelines are compatible with OIE guidelines. OIE guidelines for disposal are presented in Annex 6. The main disposal method chosen by all stakeholders is the burial pit, that will be constructed according to standards and specifications set by the Ministry of Agriculture. The second disposal option was cremation, this option will be used for manure and other wastes if burial would be impractical due to space limitations. Incineration, mobile and fixed was seen too expensive to purchase and operate. In addition, incinerators if not properly operated will cause severe air pollution, therefore incineration was not seen as an option. Composting is not seen as a viable option even for manure because of lack of biosecurity measures at the farms. All farms visited were accessible to wild birds; some of them were accessible to rodents. Considering that these farms cannot be secured, the composting option was discarded. These methods are generally presented with regards to their environmental impact and include specifications on environmental safeguarding in Annex 6. Box 4 displays the options for disposal with priorities.

Box 4: Disposal options prioritized

- 1) A) Disposal of animal carcass on farm if the location within the farm area is acceptable (conditions for siting the disposal location that are shown in Annex 6 should be met).
B) Disposal of other contaminated waste in the same burial pit with the animal carcass.
C) Cremation of waste other than animal carcass on farm if space is limited to include other wastes with the animal carcass in the burial pit. Cremation should be performed according to the specification in Annex 6.
- 2) A) Disposal of animal carcass in a burial pit outside the farm.
B) Transport of animal carcass to an offsite location if the farm area does not allow for disposal. This site should be located within the 3 kilometers zone in which culling will take place. No transfer of poultry will take place outside the infected zone.
C) Cremation of waste other than animal carcass on farm if transport of these wastes is not feasible. Cremation should be performed according to the specification in Annex 6.
- 3) If options 1 and 2 are not feasible, then cremation onsite of all animal carcass and waste should take place. Cremation should be performed according to the specification in Annex 6.

The Rapid Response and Culling Teams will decide upon the siting the burial pit. The EQA will prepare plans in coordination with competent bodies²⁶ for water sensitivity, and soil permeability that will help the environmentalist participant in the RRCT to make a

²⁶ These include, Ministry of Planning and Palestinian Water Authority.

decision on a location. The environmentalist will take into consideration the following issues before giving an approval on the site; 1) sensitivity to water resources, 2) soil permeability, 3) distance to human settlements, 4) accessibility to digging equipment, 5) slope of the land, and 6) availability of space for temporary storage of soil.

The persons involved in culling, transport and disposal operations need to have Personal Protection Equipment, be vaccinated by the Ministry of Health, and to have undergone specific, required training for such activities. Transport vehicles also need to be approved prior to use, while transport personnel needs to meet all the requirements set forth for personnel dealing with culling and disposal.

The Standard Operating Procedures for culling, transport and disposal are not issued yet, therefore it is recommended to start this activity as soon as possible. In addition, training on these procedures is recommended. Both of these activities are covered under the UNTF project activities. Although the operating procedures are not in place, there is a common acceptance among the stakeholders that OIE standards will be followed. The following guidelines are agreed upon by Ministry of Agriculture for culling, transport and disposal until the standard operating procedures manual will be prepared. The Standard operating procedures for culling, transport and disposal will be ready by April 2008. Recommendations for improvement are embedded in the guidelines is in italic.

Guidelines for culling, transport and operation²⁷:

- 1) Divide the country in geographical units, and prevent animal transfer from one area to another. (Requires a ministerial decree).
- 2) All poultry within 3 km radius will be culled. According to the number of outbreaks and poultry population density, the department of Veterinarian Services and Animal health will decide whether to cull or vaccinate poultry between three and 10 kilometers of the outbreak. Active monitoring and surveillance will take place for the zone 3 to 10 kilometers.
- 3) Animal slaughter is not allowed unless at designated locations (requires a ministerial decree)
- 4) Birds that require culling should be placed in plastic bags;

Recommendations: *There should be a clear specification of how to collect the live birds in plastic bags without releasing too much aerosols in the atmosphere²⁸. Whatever the method for collecting the birds and placing them in bags chosen, it should be clarified. Any safety procedure, or PPE use should be clearly identified and the RRCT should be properly trained to supervise bird collection and culling. The RRCT are going to be supervising workers and ensuring that all operations are conducted according to procedures. The actual work is expected to be conducted by a contractor. Training of potential contractor workers should take place one day before commencing the procedures, and the training should be*

²⁷ Note: Some of these guidelines were in the National AI Control and Eradication Plan, the rest was agreed upon by the Veterinary Services and Animal Health Department during the preparation of the EMP.

²⁸ (In 2006 in Gaza, these birds were poisoned, which made the collection of the birds with minimal aerosols production).

- included in the contract. If these birds to be cremated, the plastic bags should not be burned as this will lead to dioxin production.*
- 5) After birds are collected in these bags they are placed in culling chambers using carbon dioxide²⁹. Other methods can be used if Carbon Dioxide chambers are not available, however should be according to OIE guidelines for culling. The current requirements issued by MOA are:
- a. Prior to introduction of carbon dioxide, the chamber must be appropriately sealed to allow control over the carbon dioxide concentration
 - b. The culling chamber should be gradually filled with carbon dioxide so that all birds are exposed to a concentration above 40% until the birds are dead.
- Recommendations:** *In addition to the above recommendations on the use of the chambers, Standard operating procedures for this step should include; 1) how many birds can be placed in the chamber at a time, 2) how to place the birds in the chamber, 3) retention time, 4) how to empty the birds from the chambers, 5) where to place the birds when emptying the chambers, 6) how to disinfect these chambers after the culling process.*
- 6) All Culled birds to be buried as follow:
- Recommendations:** *the environmental considerations should be specified clearly on ground water protection of the site. Considerations of the water sensitivity, proximity to springs and wells, and soil permeability should be considered. The EQA officials indicated that they will prepare appropriate maps with the support of other Agencies, such as Water Authority and the Ministry of Planning detailing issues of importance to help in the selection of the burial sites.*
- a. Favorable location of burial is onsite, however if that is not possible, then transportation to an offsite location should take³⁰. In this case, all procedures followed should that takes into considerations safe environmental and biosafety standards.
- Recommendations:** *Because biosafety standards are not issues yet, it is important to make sure that these procedures include transportation in closed containers, use of PPE, and disinfection of vehicles.*
- b. Excavate the burial pit with the following dimensions: 4 meters depth, 2 meters width, the length of the burial pit depends on the amount of the waste and carcasses that need to be buried.
 - c. This hole should be lined with quicklime.
- Recommendations:** *it suggested issuing specification for the quicklime; including the approximate thickness, or the amount of quicklime required per square meter. In addition, a clear differentiation between quicklime*

²⁹ Note: When communicating with the Ministry of agriculture, it was indicated that the bags would be open, although not mentioned in the plan, and that the six mobile chambers were build, each can hold about 800 birds.

³⁰ The ministry of agriculture, indicated that probably only about 40% of the farms will be able to have onsite burial in case of an epidemic; the rest (about 60%) will probably has to be transported to a different site, considering the current geographical and demographical conditions.

and slaked lime should be indicated, as many might use slaked lime instead of quicklime.

- d. All sides of the specific hole should be covered by HDPE plastic above the quicklime. Thickness of 0.15mm. This plastic is widely available in the country as it is used in agricultural practices, and usually is delivered in less than a day. In addition, this plastic has low permeability and can be ordered in any size required, so it can be ordered according to the size of the burial pit.

Recommendations: *need specification of type, grade, thickness, and permeability.*³¹

- e. The hole should be sanitized by anti viral reagents. A list of disinfectants and concentrations will be issued by MOA, and the RRCT will guide the proper and safe use of these chemicals. Only chemical accepted internationally will be used.

- f. The carcasses are then placed in the burial pit.

- g. Add 40 cm of excavated soil.

- h. Add an unbroken layer of slaked lime.

- i. Cover with plastic

Recommendations: *The type of plastic, grade, and thickness should be identified.*

- j. Cover with soil (at least 2 meters of soil is required in total).

- k. The location of the burial site is then disinfected with anti viral drugs.

- l. The team leader should ensure that health and safety measures of the personnel and biosecurity measures were implemented properly to prevent transmission of the AI to humans and to other locations.

- m. Team leader should provide a descriptive report a the conclusion of the culling procedures, and report on the progress and on any problems

- n. **Recommendations:** *It is recommended to add a step for marking the site, and its identification on the map.*

- o. **Recommendation:** *It is recommended that a report regarding the site use and location to be given to the local governmental unit if available and to the Ministry of Local Government, as they are authorized body to give licenses for construction.*

- 7) **Recommendation:** *It is recommended that the Ministry of Health at the governorate level would keep records of all workers, farmers and supervisors at the culling and disposal sites, and to follow up their health status afterwards. Currently the ministry of Health is in charge of vaccinating these workers and supervisors.*

- 8) All manure and effluents should be burned, and then sanitization to the premises and all area around it should be done.

- 9) Disposal and or disinfection of the PPE standard procedures should be in place.

- 10) **Recommendation** *It is recommended that standard operating procedures for vehicles disinfection should be established.*

³¹ In Gaza, they used Grade 2 as they could not afford paying for grade 1. Grade 2 would have some production problems, and might have holes and leak.

- 11) **Recommendation** *It is recommended: that standard operating procedures for disinfection of the farm should be established, it should include 1) the frequency of disinfecting the site, 2) the time required between two disinfection events after an AI outbreak, and 3) the time when the farm can resume operations.*

Strengthening the laboratory capacity The project will address laboratory waste management through specific training based on guidelines such as the International Best Practice in Safety of Research Laboratories (Annex 7), or the Guidance on the Biosafety Level for Laboratories (Annex 8). It is important to note that this segment will focus on existing structures and will not entail large-scale construction. Because biosafety Level II and Level III is required for laboratories handling HPAI, these laboratories would have to meet certain criteria, which include 1) containment of pathogenic agents, 2) access control, 3) release solely of disinfected and harmless agents, 4) the development of currently non-existent biosafety and waste management laboratory manuals, and 5) conduct training on these manuals for laboratory technicians. The project activities include these mitigation measures except for developing the manuals for biosafety, and developing the manuals for waste management. **The EA recommends biosafety manual as well as waste management manual to be developed.** This activity will require a budget that was not included in the animal component and should be utilized from the implementation of the environmental management plan component. **The EA also recommends training of laboratory technicians on biosafety,** however this activity will be conducted by the support of FAO as agreed upon with the MOA.

The Ministry of Agriculture referral laboratories, the current laboratory practice is below biosafety and biosecurity standards. There is a need to have an autoclave that is big enough to disinfect all contaminated waste with pathogenic AI. Currently, the hoods are not installed, and safety cabinets are not installed as well, all air is released without any filters posing a threat of release of the virus to the atmosphere. Wastewater produced from the laboratory is not treated, and even it is not decontaminate. The project under UTNF grant includes construction of the referral laboratory in Birzeit. This laboratory will be constructed according to international biosecurity and biosafety standards and will accommodate sections with biosecurity levels 2 and 3. Meanwhile, the purchase of the autoclave is a necessity to disinfect liquid and solid waste produced, as the size of the autoclave in the laboratory is too small and located at another floor.

The referral laboratory is currently conducts pathology of animals. In the newly established laboratory, a separate section will be for pathology. Although it is better to obtain samples for AI at the farm, and chicken should not be transported outside the farm, in case of suspicion in AI. However, when farmers bring animal to the laboratory for pathology test, therefore the laboratory have to dispose the carcasses properly. Currently all carcasses is placed in an autoclave bag, closed and placed in the municipal solid waste container, that is open and accessible for public and wild animals.

It is recommended to equip the agricultural laboratories with incinerators for carcasses disposal that arrives to the laboratory, particularly those that are infected with zoonotic disease or cannot be disposed otherwise. However, these incinerators should be

provided with air purifying units to minimize air pollution, and all plastic is prohibited to enter to the incinerator as its burning leads to dioxin and furan production, well known to be carcinogenic materials. The operators for these incinerators should be properly trained, and manual of operations should be included with the project. The disadvantage of the incinerators, is its high cost, however it is characterized by a very high efficiency in decontamination. The ashes produced should be handled as special hazardous waste and disposed off accordingly. Monitoring of operation of these incinerators should take place by both MOH and EQA. If incinerators cannot be purchased by the project, then an alternative sanitary method for the disposal of carcasses produced from the laboratory on daily basis should be determined and utilized.

The EA recommends that necessary equipment to improve the biosafety of the laboratory to be provided from the project activities, including an autoclave, an incinerator or a disposal method for carcass from laboratories, and other equipment required to reach the safety biosafety levels 2 and 3, such HEPA filter, ultraviolet lamps...etc.

Chemical use needs to be limited to the chemicals listed in the official list to be included within the updated contingency plan and strategic documents. The list of chemicals needs to be discussed with EQA to ensure that these chemicals are not resistant for biodegradation and will not cause harm to the environment. Chemicals, such as disinfectants need to be carefully used according to the defined procedures, in order to prevent excessive chemical inflow into the natural environment, and to prevent possible poisoning.

5.2 Mitigation Measures for Human Health Component

The only project activity under the human health component that can pose a moderate negative impact is strengthening the capacity of existing laboratories, including the provision of equipment necessary for specimen collection, transportation, and testing. It will also support upgrading of the diagnostic capacity of existing laboratories. The key environmental issue for this component is related to zoonotic disease prevention and special waste management.

The Ministry of Health has a referral laboratory for samples from humans such as blood, urine, swaps for diseases, as well as testing water, food, and drugs. The laboratory has the ability to conduct both chemical and bacteriological tests. The current laboratory has a room with biosafety level 2. However the HEPA filters have not been maintained or changed since installation, all ultraviolet lamps were not maintained. In addition, spare ultraviolet lamps are not available. There are no emergency eye wash facilities in the laboratories, and all liquid waste is disposed off in the sink without any treatment. The only treatment of waste in the laboratory is for infectious materials. Other hazardous chemicals are disposed without any control. A problem that has been facing the Laboratory is disposal of hazardous waste, in the past an Israeli company used to take the waste to an Israeli facility. However for the past 6 years this company did not come due to political reasons. In addition, there is no Palestinian hazardous waste storage or treatment facility in the West Bank. Therefore, there is a need to find a temporary

storage facility until a final solution is found at the national level. In Gaza city there is a cell for storage of hazardous waste that can be used for hazardous disinfected wastes from laboratory facilities after the introduction of a proper management plan is introduced.

Therefore, the EA recommends preparing operational manual for waste management produced from the laboratory and equipping the laboratory with any required equipment to reach the biosafety levels 3 and acceptable waste management practices. Necessary equipment includes emergency eye wash devices, maintenance of the HEPA filters, and ultraviolet lamps. After developing the hazardous waste management plan, additional equipment might be necessary, and at that stage should be included in the project. In order to improve the biosafety levels, the Laboratory biosafety Manual issued by WHO can be used in these laboratories³².

The major identified environmental impacts are presented in the Environmental Management Plan, along with the proposed mitigation measures and monitoring requirements are presented in Table 1.

³² WHO (2004). Laboratory biosafety manual (Third Edition) Geneva. Can be found online on the following website:
http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/

Table 1: Environmental Management Plan

Activities	Potential Major Impacts/ issues	Mitigation Measures	Monitoring Requirements	Budget	Responsibility for Mitigation	Responsibility for Monitoring and Supervision
I. Animal Health Component: B. Strengthening Disease Surveillance, Diagnostic Capacity and Virus Research						
Strengthening of Veterinary Services including construction and/or refurbishing of existing diagnostic laboratories)	Construction related impacts from limited civil works financed as part of upgrading priority infrastructure.	These impacts are to be mitigated by following standard good construction practices/FIDIC standards.	Regular supervision of construction activities will include monitoring the implementation of FIDIC standards.	minor costs	The FIDIC standards and good practices in construction should be clearly specified in the construction contract, while the site supervisor and authority responsible for supervising construction progress should also monitor environmental parameters and point out practices and measures that may help prevent degradation caused by construction.	
Strengthening Animal Disease Surveillance and Diagnostic Capacity	Cross-contamination or infections caused by viral agents.	Follow appropriate Biosafety Level Standards by supporting upgrading of labs and training of staff.	Inspection of premises, staff training and introduction of safety procedures at all diagnostic labs, prior to installation of equipment and at six month intervals thereafter.	Staff training on biosafety is covered from FAO project on biosafety	MOA	Internal supervision from MOA, Report on Waste management practices to be submitted to EQA and MOH.
	Poor management of lab waste, air or water borne releases of viral agents and pathogens	Follow internationally accepted lab waste management practices. Has to be adapted into laboratory manuals.		Cost of waste management manual for MOA laboratories not included in the project: 15,000		Accreditation of laboratory for Biosafety standard
		To develop biosafety manual for MOA laboratories		Cost of biosafety manual for MOA laboratories not included in the project: 10,000	Consultant	MOA
		To provide the necessary equipment		Cost of equipment is included in the animal health component of the project	PIU	MOA

Activities	Potential Major Impacts/ issues	Mitigation Measures	Monitoring Requirements	Budget	Responsibility for Mitigation	Responsibility for Monitoring and Supervision
1. Animal Health Component: C. Strengthening HPAI Control Programs and Outbreak Containment Plans.						
C1: Targeting virus elimination at the source- work plans for culling, transport and disposal of carcasses						
Collection and disposal of wild birds	Poses risks of spreading the virus and of exposure of personnel.	Policy and operating procedures, manual for collecting dead wild birds, use of personnel protective equipment (PPE), decontamination equipment and procedures in place.	During regular supervision, verify availability and use of PPE and certification of personnel; and monitor health status/record of personnel involved in collection/ transport/ disposal.	Policy and manual included in UNTF project. Decontamination equipment included in current project. PPE included in Both projects	Consultant	MOA and EQA
Culling of birds	Poses risks of spreading the virus and of exposure of personnel. Risks of intoxication when using chemicals for culling.	Follow FAO/OIE guidelines on culling Use PPE. Code of conduct on distribution, handling and use of chemicals.	Verify guidelines in operations manual Procurement documents Training manuals Monitor health status/record of personnel involved in culling.	Training of RRCT by FAO. Vaccination included in the project. PPE included in the Project. Training of workers of the contractor will be compulsory and part of the binding contract.	MOA MOH preventive medicine MOA Contractor	RRCT

Activities	Potential Major Impacts/ issues	Mitigation Measures	Monitoring Requirements	Budget	Responsibility for Mitigation	Responsibility for Monitoring and Supervision
Disposal of culled birds	<p>Poor choice of disposal options and disposal sites may pose risk of spreading the virus</p> <p>Dust generated during excavation</p> <p>Transfer of virus to humans through unauthorized entry on site</p> <p>Loss of soil quality in excavation</p>	<p>See Annex 6 on comparison of different disposal options for choosing a disposal option and disposal site most suitable for local conditions. (options 1 and 2)</p> <p>Suppress dust with water Close off site with fence</p> <p>Clearly mark site of the pit.</p> <p>Use excavated soil in cover</p> <p>Disinfect the burial area</p>	<p>During regular supervision, confirm whether environmental and safety considerations are met; verify certification of personnel; availability and use of PPE</p>	<p>Cost of excavating 4 USD per cubic meters with transportation.</p> <p>Cost of excavating without transportation 2 USD per cubic meters.</p> <p>Cost of fencing 15 USD per square meters</p> <p>Cost quicklime 150-160 USD per tonne.</p> <p>Cost of Plastic 4.5-5 USD per kilogram.</p> <p>Marking the site about 200 USD per site.</p> <p>Cost of labor 25USD per day</p> <p>Disinfectants included in Project budget</p>	Contractor	RRCT

Activities	Potential Major Impacts/ issues	Mitigation Measures	Monitoring Requirements	Budget	Responsibility for Mitigation	Responsibility for Monitoring and Supervision
Disposal of farm waste (manure, eggs, feathers, contaminated equipment etc.).	Risk of dissemination of the virus during movement and transport of manure. Risk of dissemination of virus when handling contaminated eggs and hatchery waste and/or equipment. Risk of groundwater pollution.	Composting, burning or burial on site (not accessible to other animals) when feasible. Use of PPE and limit aerosols. Site selection (away from residences, lakes, ponds, streams and water tables).	Use of PPE. Proper site selection. Isolation from residences and other birds. Proper transport equipment.	Cost of excavating 4 USD per cubic meters with transportation. Cost of excavating without transportation 2 USD per cubic meters. Cost of fencing 15 USD per square meters Cost quicklime 150-160 USD per tonne. Cost of Plastic 4.5-5 USD per kilogram. Marking the site about 200 USD per site. Cost of labor 25USD per day Disinfectants included in Project budget	contractor	RRCT
Decontamination	Risk of virus dissemination.	Use recommended detergents.	Procurement of disinfectants and detergents	cost included in the project	contractor	RRCT
	Risk of groundwater pollution.	Thoroughly disinfect materials that come in contact with bird droppings.	Verify procedures and training manuals.			
	Risk of intoxication when using chemicals.	Clear decontamination procedures.				

Activities	Potential Major Impacts/ issues	Mitigation Measures	Monitoring Requirements	Budget	Responsibility for Mitigation	Responsibility for Monitoring and Supervision
II. Human Health Component: B. Strengthening of National Public Health Surveillance Systems						
Improvements of Laboratory Networks	Cross-contamination or infections caused by viral agents.	Follow appropriate Biosafety Level Standards ⁶ by supporting upgrading of labs and training of staff.	Inspection of premises, staff training and introduction of safety procedures at all diagnostic labs, prior to installation of equipment and at six month intervals thereafter.	Training provided by other projects on biosafety	MOH	Law identifies EQA and MOH responsible for Hazardous Waste Management
	Poor management of lab waste.	Follow internationally accepted lab waste management practices.		Lab equipment included in the project. Development of manuals for biosafety and waste management cost: 25,000USD for both manuals		
II. Human Health Component: C. Strengthening Health System Response Capacity						
Medical Services (includes support to rehabilitate and equip selected health facilities for the delivery of critical medical services)	Cross-contamination or infections caused by viral agents due to poor management of: infectious health care wastes; and laboratory wastes;	Develop hospital/health clinic specific comprehensive laboratory waste management and health care waste management plans.	Inspection of premises, staff training and introduction of safety procedures at all diagnostic labs, prior to installation of equipment and at six month intervals thereafter.	Project includes PPE, equipment and training	Local health care facilities and providers	MOH
For all components						
Hire an environmental specialist in the project implementation unit to follow up the implementation of the plan				24,000 USD per year, 48,000 USD for project duration.		

6. Monitoring and Supervision

The monitoring activities are closely linked to the reporting procedure outlined in Section 12 and the Institutional and Implementation Arrangements in Sections 10 and 11. During outbreak among poultry, RRCT will conduct all necessary measures for containment and control of the outbreak, including mitigation measures prescribed within this EMP, and will report to TFAI, which in turn will report to the veterinarian services and animal health department. This in turn reports to NCAIC as described in the plan of measures in case of an outbreak of AI in Occupied Palestinian Territory. Because environmental mitigation measure implementation cannot be separated from the activities defined within the national plans and guidelines, it is suggested that the RRCT will monitor all activities related to culling, transport and disposal of carcasses and waste, as well as the use of disinfectants. The team will report all activities, additional reporting on environmental and health issues to be reported, will allow the monitoring process. The environmental reporting will be done by the EQA member of the RRCT, i.e. an environmentalist; therefore it is crucial that logistical support is provided to EQA staff to join the RRCT. These reports can be discussed afterwards within the NCAIC to make sure that culling, transport, and disposal were conducted according to environmental mitigation measures. As for laboratories waste management, the law gives this authority to both EQA and MOH. It is recommended that each governmental laboratory reports about its waste management practices to both EQA and MOH / Environmental Health Department, and that a copy of this report is given to the NCAIC to make sure that implementation is conducted according to mitigation measures suggested.

7. Legal Agreements

In keeping with good practice, all legal agreements dealing with the Project implementation, made between the World Bank, the Palestinian Authority and Implementing Units will reflect the major findings and issues pointed out in this Environmental Assessment and shall be consistent with the project implementation plan or operations manual.

8. Bidding Contracts

Requirements of the EMP can be broadly grouped into four different categories and activities that can be conducted by subcontractors, for which specific requirements need to be made. These groups of activities are as follows:

- a. Minor construction works during rehabilitation of laboratory structures and healthcare facilities
- b. Inadvertent virus spread from outbreak sites, laboratories and diseased animal management
- c. Exposure or releases of chemicals used during disinfection
- d. Transport of culled animals

The construction works and contractors would need to follow the FIDIC – International Federation of Consulting Engineers (www.fidic.org) along with some of the general clauses for good construction and engineering practice listed in Annex 9.

Laboratory Containment – during construction and rehabilitation of the laboratory, the laboratory experts will closely participate in the rehabilitation process and will provide input on the Biosafety requirements, including decisions on the material to be used, containment of the laboratory, ventilation, filters, wastewater collection and disinfection, UV light disinfection of air and surfaces, hazardous solid and liquid waste management requirements.

Culling, Transport and Disposal activities shall be carried out in accordance with the procedures defined by the FAO/OIE and the Ministry of Agriculture. The persons involved in these operations need to have Personal Protection Equipment, be vaccinated by the Ministry of Health, and to have undergone specific, required training for such activities. Transport vehicles also need to be approved prior to use, while transport personnel needs to meet all the requirements set forth for personnel dealing with culling and disposal.

Chemical use needs to be limited to the chemicals listed in the official list to be included within the future Contingency Plan and strategic documents. Chemicals, such as disinfectants need to be carefully used according to the defined procedures, in order to prevent excessive chemical inflow into the natural environment, and to prevent possible poisoning.

9. Implementation Schedules

Mitigation measure	Frequency	Duration	Monitoring
Following FIDIC and good construction practices during construction activities	Continuous - during construction activities	Implementation of this measure will last as long as construction is on-going, including measures during pre construction and earth-works phase	Site visits, monitoring to be conducted by site supervisor, while the contractor would need to appoint a staff member that would be responsible for following the guidelines.
Provide adequate training for veterinary, medical and laboratory staff and provide adequate equipment, including PPE, disinfection materials and equipment	<ul style="list-style-type: none"> • Both, training and equipment are foreseen to be direct results of the Project implementation. • Many of the equipment and training will be provided under the UNTF grant, and some will be during this current project according to the needs. • The equipment and training has to be conducted as early as possible in the project. • Regular inventory and updating is required. 	Training cycles to be determined under the UNTF project.	MOH and MOA need to keep track of staffs that have attended training and delegate responsibilities and activities accordingly. In addition, they need to monitor and conduct inventory of the available supplies and regularly update equipment available.
Increase of laboratory biosafety level and inspection of laboratory / improvement of waste management practices (for MOA an MOH).	<ul style="list-style-type: none"> • Prepare biosafety and waste management laboratory manuals, should include the needs of the laboratories for equipment to achieve these levels • Purchase the required equipment • Training on the biosafety and waste management laboratory manuals. • The new lab for the MOA needs to be 	The preliminary inspection will be carried out as soon as the laboratory meets all the standards and criteria, by an external body. .Recertification or renewal of accreditation has to be according to the	An external body will be responsible the certification, as there is not any available in the country. MOA indicated that FAO might be able to provide technical assistance to accredit the laboratories.

	constructed urgently, and its biosafety level needs to be certified or inspected as soon as the laboratory is complete. (under UNTF grant)	certification body.	
Excavation of pits, fencing and marking	<p>These pits can be allocated following the potential outbreaks. These pits will be allocated in coordination between the EQA, MOA and MOH during the visits of the Rapid response and culling teams. To allow quick, however well planned decision making on the site, maps will be prepared by EQA for water sensitivity in each district that contains a culling team. Coordination should take place with Israelis if the location of the disposal is located in Area C according to OSLO II agreement to obtain approval for proper disposal. This coordination should be initiated as soon as a suspected case is observed in any location to start security arrangements regarding the disposal at the Site in Area C if found to be suitable.</p> <p>EQA should coordinate with Water Authority about the potential disposal site as soon as a suspect case is been identified to ensure that no harm for the water resources will occur.</p>	The duration of this activity depends on the extent of the outbreak	The activities will be implemented by a local contractor and monitored by the RRCT.

10 Implementation arrangements

EQA and MOH overlapping/conflicting responsibilities particularly in relation to disposal of waste, its monitoring, whether it be from laboratories or at the farms. This is because of the overlapping in responsibilities as assigned by the laws. There is an urgent need to solve this issue legally. Although this overlapping responsibility and arrangement for implementation of this project, the problem was solved at the district level as the RRCT will monitor and supervise the implementation of the arrangements. Also the existence of committees on the governorate level in which both are members facilitate cooperation for implementation. MOA and MOH has clear cut different responsibilities with no overlap or conflict with regards to the AI activities.

11 Institutional arrangements

The establishment of the NCAIC was critical to improve coordination and flow of information among member institutions at the central level. Members of this committee include all important stakeholders, such as the MOH (chair), MOA (Deputy –Chair), MoF, EQA, Ministry of National Economics, Association of poultry growers, Ministry of Civil affairs, Palestinian Agricultural Relief Committees, and coordinator of the governmental affairs.. On the governorate level, committee was established that is chaired by the governor, in which members from the Ministry of Health, the Ministry of Agriculture, EQA, Ministry of Public Works, and Ministry of Local Government. The role of this committee is to facilitate the work of the Rapid Response and Culling teams that will be supervising the actual culling and disposal. In addition, RRCC were established to supervise and monitor culling, transport, disposal and disinfection during an outbreak in poultry.

12 Reporting

Reporting of AI control and containment activities was discussed in the institutional setting section. The reporting will follow the different stages of activities as described in the plan of action in case of an AI suspected among poultry (see section 4.2). Also reporting between sectors is at three levels, the governorate level, an intermediate level (West Bank /Gaza Strip), the national level, as well as at the regional level. The most important that there is two way major communications between the MOA and the MOH to report any suspect cases immediately to the NCAIC, and to inform each other at other levels. After all reports are finalized, it is suggested that they will be summarized and disseminate the reports to the project implementation unit and other agencies included in the project.

13 Visits to Industrial and Backyard Poultry Farmers

Five farms and one hatchery were visited. The distribution of the farms among governorates, rural/urban, and type is shown in Table 2.

Table 2: Type of Farms Visited

Type	Governorate	Rural/Urban	Number of birds
Hatchery	Hebron	Urban	
Broiler	Hebron	Rural (first floor of the residence)	10,000
Layers	Bethlehem	City Boarder Backyard	10,000 available – Maximum capacity 20,000
Mixed birds	Ramallah and El Bireh	Urban Household	Less than 50
Mixed birds	Ramallah and El Bireh	Rural Household	Less than 20
Broilers	Ramallah and El Bireh	Rural Commercial	10,000

The farm in Hebron was a rural area farm, composed of 10,000 broilers. The farm was seen to be on the first floor, while the owner lives on the upper floor with his family. The farm did not have any biosecurity procedures, it was open to the atmosphere, and kids were around the place. The farmer indicated that there was a great economic loss last year, when the AI hit Gaza Strip, and he could not sell his broilers which were ready to sell just couple days after the disease was found in Gaza. The farmer use open burning to dispose any dead birds if few, when many, the farmer takes the deceased animals to an open area further away from his residence and dispose it off or burn it.

The farm visited in Beit Jala was a layers farm, and it also had about 10,000 chickens, the farm capacity is about 20,000. The farmer had problems with rodents entering to the area of the chicken, also some chicken were seen outside the barracks area. Birds were observed within the farm premises; the net covering the farm is not tight and has several holes. This farm was in the backyard of the farmer. The owner indicated that the price of eggs went down dramatically when AI cases were identified in Gaza, as many people stopped eating poultry products. The hatchery visited in Hebron had moderate biosecurity procedures, the vehicles entering the farm was disinfected, then disinfectant for shoes was at the door, and the area is cleaned and disinfectant regularly. The waste from the hatchery is disposed off with municipal waste, on the day that waste is collected, the hatchery manager call the municipality to collect the waste. A loading duck is available for the waste hauling.

The commercial farm visited in Ramallah rural area (Ein Samia) had no biosecurity procedures, wild bird shared the feed with poultry. The farm itself was in a building that was used strictly for the farm. There was a barrel outside the farm in which carcass is disposed off by burning. Many of the farms in Palestine are taking the form of backyard (i.e. in the backyard, or downstairs), however at a commercial level, with 10,000 chicken per circle.

Two backyard farms in an urban and rural area were visited in Ramallah governorate, these farms, and raise animals for household consumption only. The birds were separated from other animals in most cases. Nets were available to prevent the entrance of wild birds.

In general it was noticed that biosecurity levels are very low at all farms, and would require an investment to improve these levels, to prevent entrance of rodents and wild birds to the farms. It was noted that disinfection procedures for employees when entering or existing farms were not in place in these farms; therefore, posing these farms to higher risks. The current poultry practices are under developed in the biosecurity field, which increase the risk of spreading the zoonotic disease rapidly. Special attention should be given to those farms that are built in the backyard or inside the household. If any of the backyard farms, particularly those inside the houses is infected, the risk to transmission to human increases significantly.

14 Consultation with stakeholders

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15. Public Briefing:

Briefing held:	August 15 th 2007, Rocky Hotel – Ramallah
Announcement Made	In Al-Quds and al-Ayyam Newspapers for two consecutive days on August 10 th and 11 th 2007. The announcement included the website where the EMP can be obtained, time and location.
Invitations sent:	Individual invitations sent to all relevant ministries, institutions, international organizations and NGOs.
EMP availability:	The EMP was available online at the following site: http://www.undp.ps/en/aboutundp/forms.html The EMP was drafted in English, although all communications, consultations took place in local language. The EMP will be translated into Local language after its final approval from the World Bank.
Major points made:	The EA/EMP Report was presented in Arabic, accompanied with a PowerPoint presentation in English. Discussion took place in local language. Major points presented were the requirements of the World Bank, already defined project components, legal setting, institutional setting, individual environmental impacts, monitoring and reporting, local legislation, and responsibility scheme.
Participants	The Minister of Health and the deputy of the Minister of Agriculture opened the meeting. 35 participants attended the briefing; list of participants within the public briefing and consultations is given in Annex 10.
Minutes of the Meeting	
1. what is an environmental management plan	Some audience thought that the aim of the environmental management plan is to prepare standard operating procedures for culling, transport and disposal and to prepare laboratory manuals. It was explained that these will be developed during the project implementation, and not part of the environmental management plan, however the plan recommends their preparation as soon as possible. Therefore, it was recommended to add a paragraph in the beginning of the document explaining what is an EMP. This comment has been integrated in the document.
2. EQA and MOH roles	Both EQA and MOH announced that hazardous waste management is their responsibility. Both laws the public Health law and the Environmental Law gives the authority for both of them to conduct their task. Although conflict regarding the issue is not an attempt to avoid doing the work, on the contrary, both institutions wanted to do the work. Therefore, lack of coordination is seen to be the conflict between the two. The lack of coordination should not affect

	<p>project implementation negatively, because the National Committee on Avian Influenza Control will be the ultimate responsible for implementing the project. In addition, an environmental specialist will be recruited for the project duration that will ensure implementation of mitigation measures according to the EMP. The National Committee on Avian Influenza is recommended to have its final say regarding the implementation of the hazardous waste issues until an agreement is reached between EQA and MOH.</p>
3. Law section	<p>Some indicated that the law section is big, and not necessary to include. It was explained that these laws will govern the environmental, agricultural and health practices, therefore they should be included to avoid any conflict between the project activities and laws. In addition, this section is important because it addresses the gaps in the regulations that might hinder project implementation according to appropriate environmental practices, as well it identifies roles and responsibilities of different stakeholders to implement and monitor the mitigation measures identified in this plan.</p>
4. Public Control Commission	<p>When discussing that there is a need to establish a mechanism to monitoring the work of ministries to abide to the Palestinian laws, the Minister of Health indicated that the Public Control Commission does this role, administratively, financially, and technically. However, the law No 17 for the year 1995 regarding the Public Control commission³³, the law indicated that this commission conducts only financial and administrative control over all Palestinian ministerial and non ministerial governmental institutions. Therefore, recommendation no. 5 in section 3.3.15 in the EMP report is still valid.</p>
5. Role of NGOs in surveillance of AI in wild Birds	<p>A non Governmental organization asked if it is possible to have a role for NGOs in surveillance of wild birds for AI. It was agreed that the Ministry of Agriculture is the official organization to conduct this task, however if an environmental organization would like to share responsibility, it should coordinate this task with the Ministry of Agriculture and follow all their precaution practices and procedures for obtaining samples, wear of PPE...etc.</p>
6. Identifying of disposal locations	<p>The main question asked whether the plan has identified centralized locations for disposal of carcass and waste. The scatter of farms in Palestinian makes it impossible to allocate limited centralized locations for disposal of wastes and carcasses. Nevertheless, in Gaza Strip, they identified that location of burial if needed to be offsite, can be in the same</p>

³³ Official gazette – Palestinian Facts –Issue 11, February 1995. page 7-21

	location of burial used in the 2006 outbreak. It is still preferable to have the first option of disposal on farm, and only if the site is not suitable the location will be off site, however within the 3 kilometers already announced to be infected area. However, indication of necessary coordination with the Israeli would be necessary if Area C is concerned. This comment has been integrated in the body of the EMP.
7. Bio security measures at farms	It was discussed that licensing of new farms should include preventive measure for disease control, and impose biosecurity measures. However these biosecurity measures are not yet established and the licensing only is for commercial size farms. Therefore, approaching farms can be conducted via public awareness campaigns for the poultry growers. The EMP already recommends establishing of these bio security measures.
8. Draft By law on animal drugs	One of the ministry of Agriculture employees indicated that a draft law on animal drugs has already been drafted and should be included in the EMP. The EMP integrated this comment in the text.
9. The word veterinarian should be replaced by a governmental or official veterinarian.	This comment was taken care of in the EMP.
10. Human Vaccination	The Ministry of Health indicated that Vaccination is not part of the project and was excluded. World Bank Employees who attended the meeting indicated that vaccination for the public in general is not in the project; however vaccination for high risk group is part of the project. The project document also include vaccination as part of the project
11. Summary of the international Health Regulations regarding	The EMP has addressed the strategy of the WHO regarding AI. The Ministry of Health wanted to have a summary of the IHR (2005). A small brief of the regulations and where can they be obtained is attached in Annex 3.
12 OIE guidelines for disposal of dead animal	Ministry of agriculture wanted to have OIE Guideline for disposal as an annex in this document. The OIE guidelines can be found on the following website appendix 3.6.6. of Terrestrial Animal Health Code (2007). Also the guidelines were attached as an annex in the EMP.

Consultation held:	August 22nd 2007, Video conference with Gaza – WHO office in Gaza and Ministry of Health - Ramallah
Announcement Made	Coordination with relevant stakeholders via email, phone calls
Invitations sent:	Individual invitations sent to all relevant ministries, institutions, international organizations and NGOs.
EMP availability:	The EMP was available online at the following site: http://www.undp.ps/en/aboutundp/forms.html The EMP was drafted in English, although all communications, consultations took place in local language. The EMP will be translated into Local language after its final approval from the World Bank.
Major points made:	The EA/EMP Report was presented in Arabic, accompanied with a PowerPoint presentation in English. Discussion took place in local language. Major points presented were the requirements of the World Bank, already defined project components, legal setting, institutional setting, individual environmental impacts, monitoring and reporting, local legislation, and responsibility scheme.
Participants	Dr. Omar Hussaini (MOH) Eng. Muhanad Adel Milad (MOH) Dr. Basem Ayesh (MoH) Dr. Majdi Dhaeir (MOH) Dr. Muhammad Abu Shamaleh (EQA) Said Syam (MOA) Mueen Keriri (MOH) Issa Nahal (MOH) Dr. Husain Abu Alqumsan (MOA) Mahmood Daher (WHO)
Minutes of the Meeting	
1. Environmental Impact Assessment Policy	Request to add to the laws section the Environmental Assessment Policy. (Integrated in the EMP text).
2. Roles of EQA and MoH	Unlike the roles conflict in the West Bank between EQA and MOH, it is seen that these roles do not overlap, however there is some lack of coordination, and requested to change the document from overlap to lack of coordination.
3. Role of EQA as part of RRCT	The inclusion of the Environmental specialist from EQA in the RRCT was seen as a very positive and important role. It is important to mention, that this recommendation was suggested for stakeholders during the preparation of the report, and immediate action took place to achieve this recommendation. EQA requested to include the provision of necessary communication

	<p>units, and training for all team members in both Gaza Strip and the West Bank. Also provision of necessary logistics such as transportation during an outbreak is essential and should be considered in the plan. Therefore communication devices for 12 members in the West Bank and 5 in Gaza should be considered as part of the project, the transportation will take place with MOA team to minimize the amount of vehicles entering the site, the training that will be conducted by FAO, should include the additional members of EQA. These comments are included in the EMP.</p>
4. Site selection	<p>EQA emphasized the importance of taking into consideration indicated in Annex 4. EQA emphasized on the importance of drafting animal carcass disposal bylaws as soon as possible. Also indicated that it might be a good idea to study potential centralized locations at least one in each governorate. Also preparation of maps that indicate potential locations would be important, and recommended that a national plan where these sites can be identified and addition of these locations on the maps using GPS and GIS to study their sensitivity for water resources, agriculture and proximity to human settlements. The EQA recommended establishing a committee to conduct the study of the following institutions: EQA, MOA, Ministry of Housing, Ministry of Local government and municipalities within each governorate, and PWA. The committee at the governorate level can start identifying these potential sites if resources are available.</p>
5) Disinfectant lists	<p>EQA indicated that all chemicals imported to the country should have an environmental approval by EQA. Therefore, the EQA requested that when discussing the disinfectant list to be reviewed from an environmental perspective with them.</p>
6) Disposal of Human Bodies in case of infection with AI	<p>An employee of the ministry of Health asked about the environmental impact of disposal of human bodies that has been diagnosed with the virus. It was noted that this aspect will be covered in the case management, in addition, any other method for handling human bodies than the current religious method would require approval by the highest religious leaders in Christian, Muslim, and Jewish religions.</p>
7) WHO guidelines for laboratory biosafety	<p>An employee of the MOH wanted to have the WHO guidelines for laboratory biosafety mentioned in the report. This comment was integrated in the document.</p>

Annex 1: Summary of the FAO and the OIE Global Strategy for the Progressive Control of Highly Pathogenic Avian Influenza (HPAI)

Vision and goal. The long-term vision of the strategy is to minimize the global threat and risk of HPAI in humans and domestic poultry, through progressive control and eradication of HPAI, particularly that caused by H5B1 virus, from terrestrial domestic poultry in Asia. Achieving this goal will diminish the global threat of a pandemic, stabilize poultry production, enhance a robust regional and international trade in poultry and poultry products, increase human and food safety, and improve the livelihoods of the rural poor.

A phased approach. The global strategy will be implemented over three time frames: immediate to short (1-3 years), short to medium (4-6 years) and medium to long term (7-10 years). During this period the spread of HPAI, mainly of the H5N1 strain, will have been progressively controlled in domestic poultry of all infected countries of Asia, and prevented from affecting those Asian countries not currently infected, but at high risk.

The immediate to short-term objective is to reduce the risk to humans by preventing further spread of HPAI in those countries that are currently infected by H5N1.

Over the medium to long-term (7-10 years), a more focused approach to HPAI will be mounted to progressively eradicate the disease from the remaining compartments of infected domestic terrestrial poultry in the region. The medium-to-long term strategy will consider all control measures, including vaccination, zoning and compartmentalization as defined in the OIE Terrestrial Animal Health Code. For the long-term success of this strategy, restructuring of the poultry sectors in the region will need to be seriously considered.

To prevent the threat of HPAI from spreading to avian influenza-free countries, the long-term strategy supports the development of active surveillance programs and emergency preparedness plans for non-infected, at risk countries. The application of OIE standards relating to the international trade of poultry and poultry products will further assist in preventing the spread of HPAI virus across continents.

Capacity building. Inadequate capacity in many countries is the principal limiting factor for effectively and quickly stamping out and controlling infectious diseases. Thus, the strategy suggests building a strong and sustainable human and physical resource capacity in the countries, to respond in a more effective and timely manner in stamping out not only HPAI outbreaks, but also other newly-emerging infectious zoonotic and trans-boundary animal diseases. Capacity building will be wide ranging and include all aspects of disease control as well as policy development and socioeconomic impact analysis.

Strategic research. The global strategy recognizes that the dynamics of the current rapid spread and persistence of HPAI remain unclear. Therefore, the strategy will facilitate strategic research to investigate the epidemiology of avian influenza, evaluate the efficacy of vaccines in domestic ducks to reduce the virus shedding in domestic duck

reservoirs, and work in close collaboration with regional and international advanced research institutions to promote the development of improved vaccines and rapid diagnostic tests. Risk analysis of various poultry production systems and along marketing chains will be carried out to better target effective disease control.

Implementation. Implementation will be at the national, regional and international levels. At the national level, well-defined country specific projects will be formulated, which will be underpinned by the formation of sub-regional HPAI support units. Through these units, sub-regional disease diagnosis and surveillance and socio-economic and policy analysis networks will be established. These subregional networks will provide the lead in the development of harmonized technical standards and regional policies related to the management of live animal movement, compensation plans, capacity building, disease reporting requirements and long term planning to restructure poultry sectors.

At the international level, coordination of the national programs and sub-regional networks will be under the umbrella of GF-TADs (global framework for the control of trans-boundary animal diseases), a joint FAO/OIE initiative. The international coordination will provide technical backstopping to the subregional networks and national programs, promote international cooperation, and mobilize and coordinate resources for HPAI control.

Partners. The main partners in implementation of the strategy will be infected and non-infected at-risk countries, and regional organizations, all of which are committed to controlling trans-boundary animal and zoonotic diseases. Given the zoonotic nature of the HPAI, and the complex interface between farming systems, livestock trade, food safety and public health, a strong international partnership among FAO, OIE and WHO will be continued. A number of other partners will be involved, important among these would be the private sector, NGOs, and regional national agriculture extensions systems (NARES).

Resources. The implementation of the strategy will require funding to support the national, regional and international HPAI control programs as outlined above.

Framework for Implementation

A Framework for Implementation has been developed by FAO/OIE, promoting national, regional, and international initiatives. It includes the following:

National initiatives:

- Development of a National Strategy for each country specific to its own conditions. It would address farming systems, presence/absence of ducks, presence of human cases or not, trade orientation, implementation capacity, and wildlife migration patterns;
- Preparation of contingency and emergency preparedness plans;
- Development of economic impact and policy frameworks;
- Prevention of avian influenza to non-infected at-risk countries through awareness, reporting, and early detection; and
- Improvement in epidemiological information on source of infection and transmission dynamics in farming system and marketplaces.

Regional initiatives:

- Standardization of diagnosis and reporting techniques among countries;
- Sharing of disease information between countries;
- Development of a regulatory framework for management of animal movements; and
- Promotion of adherence to OIE guidelines to facilitate regional trade.

Global initiatives:

- Strengthening of partnerships (FAO, OIE, WHO, UNDP, donors);
- Support for global networks (OIE Global Service Center supported by WB/DGF and donors);
- Support for sub-regional networks --OIE/FAO epidemiology collaborating centers and Avian Influenza Network (OFFLU);
- Further development of control strategies for trans-boundary animal diseases (utilizing the GF-TADs mechanism);
- Development of a Global Early Warning System (FOA/OIE/WHO);
- Coordination of research on improved tools for avian influenza control;
- Provision of global vision for avian influenza control; and
- Mobilization of resources through donor liaison and advocacy.

Annex 2: Summary of the World Health Organization (WHO) Strategy

The strategic plan lays out activities for individual countries, the international community and WHO to prepare for a pandemic and mitigate its impact. The objectives of the plan correspond to the opportunities to intervene and are structure in the following three phases:

Phase 1 -Pre-Pandemic:

(i) *Reduce opportunities for human infection.* An immediate priority is to halt spread in poultry to reduce human exposure to the virus. More intensive collaboration is needed between the animal and health sectors. Communication activities targeting stakeholders, particularly rural poultry holders, should be strengthened. Workers carrying out the culling of poultry must be protected against infection by clothing and equipment.

(ii) *Strengthen the early warning system.* To assess risks to public health and guide protective measures, information is needed on the extent of influenza infection in animals and humans and on circulating viruses. National surveillance systems must be improved urgently in potentially affected countries. When outbreaks in animals occur, active human case detection should be pursued by a coordinated animal-human health team.

Phase 2- Emergence of a Pandemic:

(iii) *Contain or delay spread at the source.* Aggressive containment measures such as isolation and prophylactic use of antiviral drugs may slow pandemic spread and allow time for response measures. An international stockpile of antiviral drugs for an emergency response should be established, starting with a stockpile for targeted early use.

Phase 3– Pandemic Declared and Spreading Internationally:

(iv) *Reduce morbidity, mortality, and social disruption.* Although mass vaccination is the preferred intervention, serious issues related to the time lag between emergence of the virus and vaccine production as well as production capacity constraints must be addressed. Anti-viral supply and production capacity are also limited. Therefore, the main responses in the immediate term should be classic “social distancing measures” such as quarantine, bans on mass gatherings, and travel restrictions, backed up by a well-designed communication strategy. For the longer term, options with industry to improve antiviral and vaccine capacity need to be explored.

(v) *Conduct research during pandemic.* Research is needed for policy development and adjustments for current and future epidemics. The main elements include: assessing the epidemiologic characteristics; monitoring the effectiveness of the interventions; and evaluating the medical and economic consequences.

Recommended Strategic Actions

In view of the immediacy of the avian influenza threat, WHO recommends that all countries undertake urgent action to prepare for a pandemic. Advice on doing so is contained in the recently revised *WHO global influenza preparedness plan (2005)* and a new *WHO checklist for influenza pandemic preparedness planning (2005)*.

Table 1 describes the phases of increasing public health risk associated with the emergence of a new influenza virus subtype that may pose a pandemic threat, and the overarching public health goals under each phase.

Table 1: Phases of Increasing Public Health Risk Associated with the Emergency of a New Influenza Virus Subtype that May Pose a Pandemic Threat

Interpandemic period	
Phase 1. No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low.	Strengthen influenza pandemic preparedness at the global, regional, national and subnational levels.
Phase 2. No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.	Minimize the risk of transmission to humans; Detect and report such transmission rapidly if it occurs.
Pandemic alert period	
Phase 3. Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.	Ensure rapid characterization of the new virus subtype and early detection, notification and response to additional cases.
Phase 4. Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.	Contain the new virus within limited foci or delay spread to gain time to implement preparedness measures, including vaccine development.
Phase 5. Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).	Maximize efforts to contain or delay spread, to possibly avert a pandemic, and to gain time to implement pandemic response measures.
Pandemic period	
Phase 6. Pandemic: increased and sustained transmission in general population	Minimize the impact of the pandemic

Note:

- a) The distinction between phase 1 and phase 2 is based on the risk of human infection or disease resulting from circulating strains in animals. The distinction is based on various factors and their relative importance according to current scientific knowledge. Factors may include pathogenicity in animals and humans, occurrence in domesticated animals and livestock or only in wildlife, whether the virus is enzootic or epizootic, geographically localized or widespread, and/or other scientific parameters.
- b) The distinction between phase 3, phase 4 and phase 5 is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geographical location and spread, severity of illness, presence of genes from human strain (if derived from an animal strain), and/or other scientific parameters. (Source: WHO 2005)

In order to accomplish the public health goals described for each phase, WHO recommends strategic actions that can be undertaken to capitalize on each opportunity to intervene. Given the many uncertainties about the evolution of the pandemic threat, including the amount of time left to prepare, a wise approach involves a mix of measures that immediately address critical problems with longer-term measures that sustainably improve the world's capacity to protect itself against the recurring pandemic threat.

The strategic actions are:

Reduce opportunities for human infection, including:

- Support to the FAO/OIE control strategy;
- Intensify collaboration between the animal and public health sectors;
- Strengthen risk communication to rural residents; and
- Improve approaches to environmental detection of the virus

Strengthen the early warning systems, including:

- Improve the detection of human cases;
- Combine detection of new outbreaks in animals with active searches for human cases;
- Support epidemiological investigation;
- Coordinate clinical research;
- Strengthen risk assessment;
- Strengthen existing national influenza centers throughout the risk-prone regions; and
- Give risk-prone countries an incentive to collaborate internationally.

Contain or delay spread at the source, including:

- Establish an international stockpile of anti-viral drugs;
- Develop mass delivery mechanisms for anti-viral drugs; and
- Conduct surveillance of antiviral susceptibility.

Reduce morbidity, mortality and social disruption, including:

- Monitor the pandemic in real time;
- Introduce non-pharmaceutical interventions;
- Use of antiviral drugs to protect priority groups;
- Augment vaccine supplies;
- Ensure equitable access to vaccines; and
- Communicate risks to the public.

Conduct research to guide response measures, including:

- Assess the epidemiological characteristics of an emerging pandemic;
- Monitor the effectiveness of human interventions; and
- Evaluate the medical and economic consequences.

Annex 3: International Health Regulations 2005³⁴

The International Health Regulations (IHR) itself can be found in both Arabic and English on the following website

http://www.who.int/gb/ebwha/pdf_files/WHA58/WHA58_3-ar.pdf

http://www.who.int/gb/ebwha/pdf_files/WHA58/WHA58_3-en.pdf

The full text for the *International Health Regulations (2005): Areas of work for implementation* can be found at this website:

http://www.who.int/csr/ihr/IHR_Areas_of_work.pdf

The areas of work for implantation indicate seven areas of work four of these (2,3,4and 5 in Table 1 are key.

	AREA OF WORK	GOAL
GLOBAL PARTNERSHIP		
1.	Foster global partnerships	WHO, all countries and all relevant sectors (e.g. health, agriculture, travel, trade, education, defense) are aware of the new rules and collaborate to provide the best available technical support and, where needed, mobilize the necessary resources for effective implementation of IHR (2005).
STRENGTHEN NATIONAL CAPACITY		
2.	Strengthen national disease surveillance, prevention, control and response systems	Each country assesses its national resources in disease surveillance and response and develops national action plans to implement and meet IHR (2005) requirements, thus permitting rapid detection and response to the risk of international disease spread
3.	Strengthen public health security in travel and transport	The risk of international spread of disease is minimized through effective permanent public health measures and response capacity at designated airports, ports and ground crossings in all countries.
PREVENT AND RESPOND TO INTERNATIONAL PUBLIC HEALTH		

³⁴ Source: WHO (2007) International Health Regulations (2005): Areas of work for implementation June 2007. WHO/CDS/EPR/IHR/2007.1

EMERGENCIES		
4.	Strengthen WHO global alert and response systems	Timely and effective coordinated response to international public health risks and public health emergencies of international concern.
5.	Strengthen the management of specific risks	Systematic international and national management of the risks known to threaten international health security, such as influenza, meningitis, yellow fever, SARS, poliomyelitis, food contamination, chemical and radioactive substances.
LEGAL ISSUES AND MONITORING		
	6. Sustain rights, obligations and procedures	New legal mechanisms as set out in the Regulations are fully developed, and upheld; all professionals involved in implementing IHR (2005) have a clear understanding of, and sustain, the new rights, obligations and procedures laid out in the Regulations.
	7. Conduct studies and monitor progress	Indicators are identified and collected regularly to monitor and evaluate IHR (2005) implementation at national and international level. WHO Secretariat reports on progress to the World Health Assembly. Specific studies are proposed to facilitate and improve implementation of the Regulations.
Source: WHO (2007) International Health Regulations (2005): Areas of work for implementation June 2007.		

The obligations under the IHR (2005) can be grouped as follows:

- those related to the core capacity requirements for countries to "detect, assess, notify and report events in accordance with the regulations" and to "respond promptly and effectively to public health risks" (e.g. Art. 5, 13, 19-22, Annex I).
- those related to the obligation, permission or prohibition of certain public health actions in respect of international travellers, goods, cargo and conveyances and the ports, airports and border crossings that they utilize (e.g. Art. 19-41).
- those related to the administration of IHR such as the nomination in each country of a National IHR Focal point and, for WHO, the nomination of WHO IHR Contact Points (e.g. Art. 4, 47-66).
- those related to the management of information and public health response for events which may constitute a "public health emergency of international concern" (e.g. Art. 5-18, Annex II), and
- those related to the full respect of human rights (e.g. Art. 3, 30, 31, 32) and the guidance provided by the Charter of the United Nations and the Constitution of the World Health Organization (e.g. Art. 3)

Annex 4: The institutional setting to respond to AI

The Ministry of Agriculture has developed the following mechanism to respond to an avian influenza outbreak³⁵.

Stage 1: A suspect case is reported to the District Veterinary Department

Stage 2: District Veterinary Department reports the suspect case to the General directorate of Veterinary Services and Animal health

Stage 3: The general directorate of Veterinary services and Animal health notifies the suspicion of an HPAI case to the NCAIC. **Comment:** *Considering that the committee is chaired by the Ministry of Health, and has a representative of the EQA, therefore these governmental institutions are immediately informed to take necessary measures.*

Stage 4: If the tests resulted in positive to H5N1, the NCAIC declares emergency and authorizes the general directorate of Veterinary services and Animal health - MOA to start Culling and take all appropriate steps needed to contain the disease (Quarantine measures, vaccination, and others).

Stage 5: The Task Force on Avian Influenza (TFAI)-MOA mobilizes the Rapid Response and Culling Teams (RRCT) and communicates the culling arrangements

Stage 6: The RRCT commence Culling

Stage 7: RRCT compile the necessary forms and handle them to the District Veterinary Department. The district Veterinary Department enters the culling data into a database and sends the culling forms to the General Directorate of Veterinary Services and Animal Health. These forms include the compensation paper work, including the number, type, owner of the farm.

Stage 8: The General Directorate of Veterinary Services and Animal Health sends the culling forms with the covering letter to the Department of Planning and cross-checks the information of the district database with the information of the:

- a) Two forms are available for culling and disposal of birds:
 - i. The first one, is the form that list the plan of action of the culling team, this form include, date, time, hours, location, number, weight and type of birds, culling method, requirements for culling, method of disposal, materials used in disposal, materials used in disinfection, names of team, other institutions that might contribute to the culling and disposals procedure.
 - ii. The second form, lists the details of the procedures as happened, including any obstacles faced the team, comments and recommendations by the team leader.
- b) Documentation of the procedure should take place – according to a form.

³⁵ Operational Manual for Compensation – Occupied Palestinian Territory. By Ane Riviere-Cinnamond. April 2006. Final Version.

The Ministry of Health has issued a Palestinian National Plan for Pandemic Influenza (2005) that takes into consideration procedures for case definitions of Avian Influenza A/H5 has been identified as follows:

- 1) Step one: patient under investigation
- 2) Possible Influenza A/H5 case
- 3) Probable Influenza A/H5 case
- 4) Confirmed Influenza A/H5 case

In addition, the plan determined the reporting system by defining the information need to be collected using forms targeting the following issues:

- 1) Avian Influenza Investigation form
- 2) History of admission to hospital
- 3) Laboratory investigation result
- 4) Procedure for collection and transport of Human specimens for laboratory diagnosis of Avian Influenza (H5N1) infection
- 5) Treatment Procedure
- 6) Sample receiving Division – Influenza Viruses Request form

Annex 5: Terrestrial Animal Health Code (2007)³⁶

APPENDIX 3.6.6.

GENERAL GUIDELINES FOR THE DISPOSAL OF DEAD ANIMALS

Article 3.6.6.1.

Introduction

The mass disposal of dead animals associated with an animal *disease outbreak* is often subject to intense public and media scrutiny thereby obligating the *Veterinary Authority* of a Member Country to not only conduct disposal operations within acceptable scientific principles to destroy the causative pathogen but also to address public and environmental concerns.

The guidelines in this Appendix are general in nature. The choice of one or more of the recommended methods should be in compliance with relevant local and national legislation and be attainable with the resources available. The guidelines should also be applied in conjunction with the procedures described for the killing of animals in Appendix 3.7.6.

Strategies for the disposal of dead animals (entire animals or parts thereof) should be prepared well in advance of any emergency. Major issues related to the disposal of dead animals include the number of animals involved, biosecurity concerns over the movement of infected or exposed animals, people and equipment, environmental concerns, and the psychological distress experienced by farmers and *animal handlers*.

Article 3.6.6.2.

Regulations and jurisdiction

The legislation regulating animal health and the organisation of the *Veterinary Authority* should give the *Veterinary Services* the authority and the legal powers to carry out the activities necessary for the efficient and effective disposal of dead animals. Cooperation between the *Veterinary Service* and other relevant government bodies is necessary to developing a coherent set of legal measures for the disposal of dead animals in advance of any emergency. In this context the following aspects should be regulated:

³⁶ http://www.oie.int/eng/normes/mcode/en_chapitre_3.6.6.htm

1. Powers of Veterinary Services (inspectors, veterinary officers, etc.) to effect controls and direct persons as well as the right of entry to an establishment for the Veterinary Services and associated personnel;
2. movement controls and the authority to make exemptions under certain biosecurity conditions, for example for transport of dead animals to another location for disposal;
3. the obligation on the involved farmer and animal handlers to cooperate with the Veterinary Services;
4. any need to transfer the ownership of animals to the competent authority;
5. the determining of the method and location of disposal, and the necessary equipment and facilities, by the Veterinary Services, in consultation with other involved authorities including national and local governmental organisations competent for the protection of human health and of the environment.

Should the chosen option for the disposal of dead animals be applied near the border of a neighbouring country, the competent authorities of that country should be consulted.

Article 3.6.6.3.

Preparedness

The mass killing and disposal of animals in the event of a disease outbreak or disposal of animals in the event of natural disasters such as floods, usually must proceed with the minimum delay. The success is determined by the structures, policies and infrastructure established in advance:

1. Relationship with industry

A relationship with industry organisations, such as farmer associations, commodity representatives, animal welfare organisations, security services, media and consumer representatives is essential to obtain compliance with animal health policies.

2. Standard operating procedures

Standard operating procedures should be developed (including documented decision-making processes, training of staff).

3. Financial preparedness

Financial preparedness means a compensation or insurance mechanism, an access to emergency funding and an access to personnel through agreements with private veterinarians.

4. Communication plan

Information sharing with officials involved in the *outbreak*, affected farmers, professional organizations, politicians and the media is essential. A well informed spokesperson should be available at all times to answer enquiries.

5. Resources

The management of resources should address such items as personnel, transport, storage facilities, equipment (such as mobile handling facilities for animals, disinfection equipment), fuel, protective and disposable material and logistical support.

6. Special equipment

Special equipment such as trucks, tractors, bulldozers, and front-end loaders should be available.

Article 3.6.6.4.

Critical elements

Critical elements which need to be considered in planning and implementation include:

1. Timeliness

Early detection of new infections, immediate killing of infected animals and rapid removal of the dead animals with inactivation of the pathogen are important. Spread of the pathogen from the dead animals and their surroundings should be blocked as soon and as effectively as possible.

2. Occupational health and safety

Disposal should be organised in such a way that the workers are safeguarded against the risks of handling decomposing dead animals. Special attention should be given to zoonotic aspects. Workers should receive appropriate training and be sufficiently protected against infection with protective clothing, gloves, face masks, effective respirators, goggles, vaccination, and effective anti viral medicines. Workers should also receive regular health checks.

3. Pathogen inactivation

The disposal procedure should be selected to result in inactivation of the pathogen.

4. Environmental concerns

Different methods of the disposal of dead animals have different effects on the environment. For instance, pyre burning will produce smoke and smells; burial might lead to gas and leachate production resulting in potential contamination of air, soil, surface and sub surface water.

5. Availability of capacity

An assessment of capacities of different methods of disposal should be made prior to any emergency. Temporary storage of dead animals in cold stores may relieve a lack of processing capacity.

6. Adequate funding

Adequacy of funding for the options chosen must be ascertained and committed at the earliest possible stage.

7. Staff resources

Availability of sufficient and well trained staff resources in particular for extended and /or large operations should be ensured. This is particularly important for technical and inspection personnel who are usually in short supply.

8. Societal acceptance

Societal acceptance is an important point in choosing a disposal method.

9. Acceptance by farmers

Farmers will be sensitive to the safety measures taken to prevent spread of the disease by disposal method selected and the transport of the dead animals to the disposal site. Adequate compensation of owners for the loss of animals or for burial or burning sites will improve acceptability.

10. Equipment

Equipment used in the disposal of dead animals can transfer infection to other premises. The cleaning and disinfection of the outside surfaces of equipment such as cranes, containers and trucks, and the departure of *vehicles* from the farm should receive special attention. Trucks transporting dead animals should be leak proof.

11. Scavengers and vectors

When disposing of dead animals, full attention should be given to preventing scavengers and vectors gaining access to dead animals, which might cause spread of disease.

12. Economic impact (short and long term including recovery)

The method of disposal used has a significant bearing on economic impact.

Article 3.6.6.5.

Practical considerations

1. Selection of disposal site

Sufficient top soil to cover the site; soil type; water drainage; prevailing wind conditions; easy access to transport; availability of meteorological data; separation from sensitive public sites, and the effect on future use.

2. Contractors

Contractors — availability of manpower, materials and equipment including transport *vehicles*; can they supply in all the needs; exclusive use of *vehicles* or would they also be used for other purposes (risk of disease transmission); access to available roads; suitable for the purpose to be used.

3. Logistical preparedness for the appropriate technology

Availability of fuel; sufficient manual labour available; sites and availability of disinfection tents for personnel; storage and disposal of protective clothing; housing for personnel to minimise the spread of infection; facilities for entry and exit control; availability of electricity for night operations; personal facilities for personnel such as toilets, drinking water; availability of communication – mobile phone reception; protection (e.g. vaccination) of personnel; rendering capacity at rendering plants; arms and ammunition, additional cold storage and holding facilities at rendering plants and abattoirs.

4. Procedures and policies for disposal of other possibly contaminated products

Animal products such as litter, manure, wool, eggs and milk; animal feed; non-animal products such as protective clothing.

5. Wildlife

Need to minimise the risks posed by wildlife, including by excluding or repelling them from the disposal site.

Article 3.6.6.6.

Recommended methods for the disposal of dead animals

The method(s) chosen should be based on local conditions and the required capacity and speed of outcome and on the conditions required for the inactivation of the causative agent.

Some of the methods below may require on-farm pre-processing prior to transportation of dead animals to central facilities for rendering or incineration. Preprocessing could include the grinding of dead animals which can then be transported in sealed containers, or be subjected to fermentation, composting or freezing.

1. Rendering

This is a closed system for mechanical and thermal treatment of animal tissues leading to stable, sterilized products, e.g. animal fat and dried animal protein. The technology exists in dedicated facilities. It produces an effective inactivation of all pathogens with the exception of prions where infectivity is reduced. The availability of the capacity should be determined in advance.

2. Incineration in a dedicated facility

In such a facility, whole dead animals or parts of animals can be completely burned and reduced to ash, often in conjunction with other substances (such as municipal waste, hazardous waste or hospital waste). Effective inactivation of pathogens, including spores, occurs. Fixed facility incineration is wholly contained and has some advantages from the environmental viewpoint as the exhausts may be fitted with afterburner chambers to completely burn hydrocarbon gases and particulate matter from the main combustion chamber.

3. Rendering and incineration

These may be combined for improved security and to provide additional fuel for furnaces in facilities used for other purposes such as in cement kilns and electricity generation plants.

4. Air curtain incineration

This process fan-forces a mass of air through a manifold, thereby creating a turbulent environment in which incineration is accelerated up to six

times for example in a burn-pit. The equipment can be mobile and, because it can be used on site, there is no requirement for transportation of the animal material. It also produces effective inactivation of pathogens.

5. Pyre burning

This open system of burning dead animals is a well established procedure that can be conducted on site with no requirement for transportation of animal material. However, it takes an extended period of time and has no way of verifying pathogen inactivation, and there may be particulate dissemination from incomplete combustion. Further, because the process is open to view, there may be a lack of acceptance by the public.

6. Composting

Composting is a natural biological decomposition process that takes place in the presence of oxygen. In the first phase, the temperature of the compost pile increases, organic materials break down into relatively small compounds, soft tissue decomposes, and bones soften partially. In the second phase, the remaining materials, mainly bones, break down fully to a dark brown or black humus containing primarily non-pathogenic bacteria and plant nutrients. However, some viruses and spore forming bacteria, such as *Bacillus anthracis*, and other pathogens such as *Mycobacterium tuberculosis* may survive.

7. Burial

In this method, whole dead animals are buried and covered by soil. Burial is an established procedure which may be conducted on site. It may not inactivate all pathogens. In some circumstances, dead animals may be disposed of by mounding whereby they are covered by a layer of soil above ground.

8. Biogas production

This is a closed system of anaerobic fermentation which would require for the disposal of dead animals or their parts prior mechanical and thermal treatment of the input material (such as the liquid product of rendering plants). This process may not inactivate all pathogens.

9. Alkaline hydrolysis

This method uses sodium hydroxide or potassium hydroxide to catalyse the hydrolysis of biological material into a sterile aqueous solution consisting of small peptides, amino acids, sugars, and soaps. Heat is applied (150°C) to accelerate the process. The only solid byproducts are

the mineral constituents of bones and teeth. This residue (2% of the original weight of the animal) is sterile and easily crushed into a powder. The temperature and alkali conditions of the process destroy the protein coats of viruses and the peptide bonds of prions. Both lipids and nucleic acids are degraded. The process is carried out in an insulated steam-jacketed, stainless steel pressure vessel.

10. Bio-refining

This is a high pressure, high temperature hydrolytic process, conducted in a sealed pressurised vessel. The waste material is treated at 180°C at 12 bar pressure for 40 minutes, heated by the indirect application of steam kj, other compostable material, paper and comparable materials, and cereal straws either alone or in combination. The process inactivates all microbiological agents.

11. Dead animal disposal at sea

International Conventions define the conditions to be met for the disposal of dead animals at sea.

Article 3.6.6.7.

Guidelines for decision-making for the disposal of dead animals

The disposal of large numbers of dead animals will be expensive. As well, fixed and variable costs will vary with the choice of the disposal method. Each method used will result in indirect costs on the environment, local economies, producers, and the livestock industry. In addition to biosecurity considerations, decision makers need to understand the economic, social, environmental protection and aesthetic impact of various disposal technologies.

A disposal option hierarchy may be incapable of fully capturing and systematizing the relevant dimensions at stake, and decision makers may be forced to consider the least preferred means. It therefore requires a comprehensive understanding of any array of dead animal disposal technologies and must reflect a balance between the scientific, economic, and social issues at stake. Timely slaughter, maintenance of security and prevention of further spread of disease, are the essential considerations in terms of disease control.

The following is an example of a possible process for aiding decision-making by comparing the suitability of various disposal options against factors that are considered important for the specific disposal event in question:

1. Step 1 - Define the factors to be considered. Include all relevant factors and allow enough flexibility to permit modifications for different

situations and locations. Examples of possible factors include operator safety, community concerns, international acceptance, transport availability, industry standards, cost effectiveness and speed of resolution. These factors can be modified or changed, as is shown in the following example, to best fit the situation of event involved.

2. Step 2 - Assess the relative importance of the factors by weighting each on their considered importance to addressing the event in question. The sum of all the weightings, regardless of the number of factors, must total 100.
3. Step 3 - Identify and list all disposal options under consideration. Rate each disposal option against each factor and assign a Utility Rating of between 1 to 10 to each comparison. The Utility Rating (U) is a number between 1 and 10 which is allocated according to how well the option achieves the ideal with respect to each factor (eg 1 = the worst possible fit, and 10 = the best fit).
4. Step 4 - For each factor and each disposal option, multiply the Factor Weight (F) x Utility Rating (U) to yield a numeric Balanced Value (V), (eg $V = F \times U$).
5. Step 5 - By adding the Balanced Values to a sum for each disposal option, it is possible to compare the suitability of disposal options by numerically ranking the sums of the Balanced Values for each disposal option. The largest sum would suggest that disposal option is the best balanced choice.

ANNEX 6 COMPARISON OF DISPOSAL METHODS FOR ANIMAL WASTES GENERATED FROM AVIAN INFLUENZA OUTBREAKS

DESCRIPTION	ENVIRONMENTAL CONSIDERATIONS	SAFETY CONSIDERATIONS	ADVANTAGES/ DISADVANTAGES
OPTION 1: BURIAL IN A PIT			
<p>Decomposition of dead birds/ carcasses and other wastes through biological degradation in a pit and involves:</p> <ul style="list-style-type: none"> Excavation of a burial pit. Placing carcasses in a deep burial pit. Covering carcasses and other wastes with soil (about 40 cm) to: (a) prevent carcasses from rising out of the pit; (b) prevent scavengers digging up carcasses; (c) help filter out odors; and (d) absorb the fluids of decomposition. Adding an unbroken layer of slaked lime [Ca(OH)₂] to protect carcasses from being uncovered by carnivores and earthworms after pit closure (lime should not be placed directly on carcasses because in wet conditions it slows, and may prevent, decomposition). Closing the pit to ground level with soil (at least 2 meters of soil is required in total). 	<p><u>Site Selection Considerations:</u></p> <ul style="list-style-type: none"> Distance to watercourses, bores, and dug wells. Height of water table (the base of the pit must be well above the water table). Slope of the land at the burial site to the nearest watercourse (drainage to and from the pit). Soil permeability. Distance to human settlements and public lands (including roads). Prevailing wind direction (for odor emission). Availability of space for temporary storage of excavated soil. Accessibility of the burial site by digging equipment (e.g., excavator). <p><u>Burial Site Inspection:</u></p> <p>Three (3) months after closure, inspection of the burial site to identify any potential problems (e.g., seepage) and take corrective measures.</p> <p><u>Transportation-Related Waste/ Wastewater Treatment:</u></p> <ul style="list-style-type: none"> Any wastewater generated from cleaning/disinfection of vehicles/ containers should be disinfected before discharge. Any waste generated during loading and unloading of vehicles as well as cleaning/disinfection of vehicles/containers should be safely disposed. 	<ul style="list-style-type: none"> Use of personal protection equipment (PPE) to ensure hygiene and safety of personnel working at the site. Availability of emergency response measures and equipment for safety breaches (e.g., availability of first aid and rescue equipment if the personnel fall into the pit). Established and documented cleaning/disinfection procedures. Availability of cleaning/ disinfection supplies/equipment. Personnel training on personnel hygiene and safety measures. <p><u>Transportation of Carcasses/Wastes to an Environmentally Suitable Site:</u></p> <p>If carcasses and other contaminated materials need to be transported off-site for disposal, then:</p> <ul style="list-style-type: none"> The vehicles must be leak-proof and covered. The vehicles and external surfaces of containers should not leave the culling area without first being thoroughly cleaned/ disinfected. The vehicles and internal, external surfaces of containers should be cleaned/ disinfected after unloading carcasses and other wastes at the environmentally suitable site. 	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> Safe disposal if environmental conditions are met. Risk of disseminating the virus to other sites can be avoided if burial can be done on site. Low cost. <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> Likely to be affected by surface water, groundwater, soil or topographical conditions. If transportation to an environmentally suitable site is required, then: (a) increases the risk of disseminating the virus to other sites, and (b) higher costs for transportation and associated mitigation measures. Risk of groundwater contamination if site selection is not appropriate.
OPTION 2: OPEN AIR BURNING (CREMATION)			
<p>This method is based on destruction of infective pathogens, animal carcasses and other wastes through thermal destruction in open air. It involves:</p> <ul style="list-style-type: none"> Digging trenches, which act as air 	<p><u>Site Selection Considerations:</u></p> <ul style="list-style-type: none"> Potential adverse impacts of heat, smoke or odor on nearby people, infrastructure (structures, underground and aerial utilities, roads, etc.) and environment (e.g., trees). 	<ul style="list-style-type: none"> Maintaining adequate fire break around the pyre (consult local fire brigades or residents for advice). Use of PPE to ensure hygiene of personnel working at the site. 	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> Crementation is not affected by surface water, groundwater, soil, and topographical conditions. Low cost, compared to incinerator

DESCRIPTION	ENVIRONMENTAL CONSIDERATIONS	SAFETY CONSIDERATIONS	ADVANTAGES/ DISADVANTAGES
<p>vents.</p> <ul style="list-style-type: none"> Placing pyre (wood) on top of trenches (upwind, at right angle to the prevailing wind direction). Placing carcasses and other wastes at the opposite side. Pouring fuel (e.g., kerosene) onto carcasses, other wastes and pyre and starting fire (adequate supply of fuel must be at the site to ensure complete cremation). 	<ul style="list-style-type: none"> Accessibility of equipment to construct and maintain the fire and for delivery of fuel and carcasses The ashes should be buried and the site should be restored. <p><u>Waste Pretreatment/Containment:</u></p> <ul style="list-style-type: none"> To avoid emission of dioxins or furans during cremation, carcasses should not be pretreated with a chlorine-bearing disinfectant or should not be contained in PVC bags. For the same reason, no other material destined for cremation should contain chlorine-bearing chemicals. 	<ul style="list-style-type: none"> Availability of emergency response measures and equipment for safety breaches (e.g., availability of first aid equipment and availability of fire fighting equipment and personnel if fire spreads around). Established and documented cleaning/disinfection procedures. Availability of cleaning/ disinfection supplies/equipment. Personnel training on personnel hygiene and safety measures. 	<p>option.</p> <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> Infective pathogens may not be effectively destroyed if combustion of carcasses and wastes is incomplete, especially under adverse atmospheric conditions (wind, precipitation). It is not possible to easily verify that all infective pathogens are destroyed in the incomplete combustion process. Air emissions from open air burning (PM, CO₂). Disposal of ash from cremation requires consideration for surface water, groundwater, soil and topographical conditions. More expensive than option 1 (burial).
OPTION 3: COMPOSTING			
<p>This method is based on thermal deactivation of the virus and decomposition of carcasses, litter and other contaminated organic wastes through aerobic biological degradation. Success of composting depends on: (a) proper nutrient mix; (b) moisture; (c) temperature; and (d) pH. Details can be found in technical documentation and websites listed.</p>	<p><u>Site Selection Considerations:</u></p> <ul style="list-style-type: none"> Must be done at the affected farm in a secure area not accessible by other animals (such as birds, rodents, cats, or dogs). Proximity to residential areas and water sources (must be away). 	<ul style="list-style-type: none"> Use of PPE to ensure hygiene of personnel working at the site. Availability of emergency response measures and equipment for safety breaches. Established and documented cleaning/disinfection procedures. Availability of cleaning/ disinfection supplies/equipment. Personnel training on personnel hygiene and safety measures. 	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> Effective for manure and litter waste. Can be undertaken within sheds or otherwise on site to avoid the risks of disseminating the virus through transport. No transportation cost. <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> Maintaining optimum temperatures for many days in cold climate areas/seasons may not be possible (or may be costly). Infective pathogens may not be effectively destroyed if ideal conditions are not achieved. Risk of disseminating the virus if the composting area is not effectively secured/ isolated. It may not be possible to easily verify that all infective pathogens are destroyed.

DESCRIPTION	ENVIRONMENTAL CONSIDERATIONS	SAFETY CONSIDERATIONS	ADVANTAGES/ DISADVANTAGES
OPTION 4: INCINERATION (FIXED)			
<p>This method is based on thermal destruction of infective pathogens carcasses and other wastes in an incinerator. It involves:</p> <ul style="list-style-type: none"> • Transporting carcasses and other wastes to the incineration site. • Cleaning containers and vehicles transporting carcasses and wastes, with treatment of the resulting wastewaters. • Incinerating carcasses and other wastes (using fuel and air) at a high temperature. • Transporting incineration residues (bottom ash/slag and fly ash) to the disposal site and disposal at the sanitary landfill. 	<p><u>Site Selection Considerations:</u></p> <ul style="list-style-type: none"> • Should not be in a floodplain. • Distance to human settlements. • Human settlements upwind of the prevailing wind direction (for odors before incineration and emissions from incineration). <p><u>Technology Requirements:</u></p> <ul style="list-style-type: none"> • Incinerator at a minimum temperature of 850°C and with a minimum residence time of 2 seconds. Temperature must be measured and recorded. • Incinerator equipped with an auxiliary burner that can be switched on when the temperature falls below 850°C. • Incinerator automatic feed system connected to temperature measurement. • Site security and inaccessibility by animals (such as birds, rodents, insects and other vermin). • Storage areas for animal carcasses and other wastes as well as incineration residues must be covered. These areas must be labeled and designed and operated to prevent accidental releases of polluting substances to the environment. Storage capacity provided to collect contaminated storm water and wastewater from spillage or firefighting. • Transportation of bottom ash/slag and fly ash in closed containers to prevent environmental releases. • Disposal of bottom ash/slag and fly ash in a sanitary landfill. <p><u>Waste Pretreatment/Containment:</u> To avoid emission of dioxins or furans during incineration, carcasses should not be pretreated with a chlorine-bearing disinfectant or should not be contained in PVC bags. For the same reason, no other material destined for incineration should contain chlorinebearing chemicals.</p>	<ul style="list-style-type: none"> • Use of PPE to ensure hygiene of personnel working at the site (incinerator operators must change their PPE before handling animal carcasses and other wastes). • Established and documented cleaning/disinfection procedures. • Established and documented emergency response procedures. • Availability of cleaning/ disinfection supplies/equipment. • Availability of emergency response equipment (e.g., first aid, fire fighting) • Personnel training on personnel hygiene/cleaning, safety and emergency response measures. • Regular inspections of the environment and equipment, with documented inspection schedules and results. <p><u>Transportation of Carcasses/Wastes to the Incineration Site:</u> When carcasses and other contaminated materials are transported to the fixed incineration site, then:</p> <ul style="list-style-type: none"> • The vehicles must be leak-proof and covered; • The vehicles and the external surfaces of containers should not leave the culling area without first being thoroughly cleaned/disinfected; and • The vehicles and internal/external surfaces of containers should be cleaned/ disinfected after unloading carcasses and other wastes at the incineration site. <p><u>Transportation of Incineration Residues to the disposal site:</u></p> <ul style="list-style-type: none"> • The vehicles must be covered. • The vehicles and containers should not leave 	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> • Complete destruction of infective pathogens. • Over 95% waste reduction. <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> • Complex technology which may be imported to the country. • High investment cost. • High operating cost (especially fuel cost). • Some spare parts may need to be imported (cost and downtime of incinerator in case of AI outbreak). • High level of operator training. • Scrutinized administrative requirements (recordkeeping, etc.). • The incineration facility may be too far from the location with the AI outbreak, requiring extensive transportation of carcasses and other wastes with infective pathogens, resulting in: (a) increased risks of disseminating the virus to other sites; and (b) higher costs for transportation and associated mitigation measures. • Air emissions from the incinerator (PM, SO₂, CO₂).

DESCRIPTION	ENVIRONMENTAL CONSIDERATIONS	SAFETY CONSIDERATIONS	ADVANTAGES/ DISADVANTAGES
		the incineration area without first being thoroughly disinfected.	
OPTION 5: INCINERATION (MOBILE)			
<p>This method is based on thermal destruction of infective pathogens, animal carcasses and other wastes in an incinerator. It involves:</p> <ul style="list-style-type: none"> • Transporting the mobile incinerator to the culling site. • Incinerating carcasses and other wastes (using fuel and air) at a high temperature. • Transporting incineration residues (bottom ash/slag and fly ash) to the disposal site and disposal at the sanitary landfill. 	<p><u>Technology Requirements:</u></p> <ul style="list-style-type: none"> • Incinerator at a minimum temperature of 850°C and with a minimum residence time of 2 seconds. • Temperature must be measured and recorded. • Incinerator equipped with an auxiliary burner that can be switched on when the temperature falls below 850°C. • Incinerator automatic feed system connected to temperature measurement. • Storage areas for animal carcasses and other wastes as well as incineration residues must be covered. These areas must be ventilated, labeled, and designed and operated to prevent accidental releases of polluting substances to the environment. • Transportation of bottom ash/slag and fly ash in closed containers to prevent environmental releases. • Disposal of bottom ash/slag and fly ash in a sanitary landfill. <p><u>Waste Pretreatment/Containment:</u> To avoid emission of dioxins or furans during incineration, carcasses should not be pretreated with a chlorine-bearing disinfectant or should not be contained in PVC bags. For the same reason, no other material destined for incineration should contain chlorine bearing chemicals.</p>	<ul style="list-style-type: none"> • Use of PPE to ensure hygiene of personnel working at the site (incinerator operators must change their PPE before handling animal carcasses and other wastes). • Established and documented cleaning/disinfection procedures. • Established and documented emergency response procedures. • Availability of cleaning/ disinfection supplies/ equipment. • Availability of emergency response equipment (e.g., first aid, fire fighting) • Personnel training on personnel hygiene/cleaning, safety and emergency response measures. 	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> • Complete destruction of infective pathogens. • Over 95% waste reduction. • Avoids the need to transport the infective pathogens, carcasses, and other wastes to the incinerator (i.e., reduced risk of disseminating the virus to other sites compared to the fixed incineration case). <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> • Complex technology which may be imported to the country. • High investment cost. • High operating cost. • Some spare parts may need to be imported (cost and downtime of incinerator in case of AI outbreak). • High level of operator training. • Scrutinized administrative requirements (recordkeeping, etc.). • Transportation of the mobile incinerator to the culling site is associated with: (a) the risk of exposing the incinerator (i.e., the investment) to damage/total loss in case of an accident (contributed by poor road conditions, severe weather, etc.); and (b) high cost of transporting incinerator to the culling site. • Accessibility of the culling site by the mobile incinerator. • Air emissions from the incinerator (PM, SO₂, CO₂).

Annex 7: International Best Practice in Safety of Research Laboratories

Source: US National Institutes of Health

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
- 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
 - 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 bio-hazardous 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 contact discarded items

Annex 8: Guidance on the Biosafety Level for Laboratories

REQUIREMENTS OF THE LABORATORY	Bio-Safety Level		
	BSL2	BSL3	BSL 4
A) Laboratory siting and structure			
1. Not next to known fire hazard	Yes	Yes	Yes
2. Workplace separated from other activities	Yes	Yes	Yes
3. Personnel access limited	Yes	Yes	Yes
4. Protected against entry/exit of rodents and insects	Yes	Yes	Yes
5. Liquid effluent must be sterilized		Yes and monitored	Yes and monitored
6. Isolated by airlock. Continuous internal airflow		Yes	Yes
7. Input and extract air to be filtered using HEPA or equivalent		Single on extract	Single for input, double for extract
8. Mechanical air supply system with fail-safe system		Yes	Yes
9. Laboratory sealable to permit fumigation		Yes	Yes
10. Incinerator for disposal of carcasses and waste	Available	Yes	Yes on site
B) Laboratory facilities			
11. Class 1/2/3 exhaust protective cabinet available	Yes	Yes	Yes
12. Direct access to autoclave	Yes	Yes with double doors	Yes with double doors
13. Specified pathogens stored in laboratory	Yes	Yes	Yes
14. Double ended dunk tank required		Preferable	Yes
15. Protective clothing not worn outside laboratory	Yes	Yes	Yes
16. Showering required before exiting laboratory			Yes
17. Safety Officer responsible for containment	Yes	Yes	Yes
18. Staff receive special training in the requirements needed	Yes	Yes	Yes
C) Laboratory discipline			
19. Warning notices for containment area	Yes	Yes	Yes
20. Laboratory must be lockable	Yes	Yes	Yes
21. Authorized entry of personnel	Yes	Yes	Yes
22. On entering all clothing removed and clean clothes put on		Yes	Yes
23. On exiting all laboratory clothes removed, individual must wash and transfer to clean side		Yes	
24. Individual must shower prior to transfer to clean side			Yes
25. All accidents reported	Yes	Yes	Yes
D) Handling of specimens			
26. Packaging requirements to be advised prior to submission	Yes	Yes	Yes
27. Incoming packages opened by trained staff	Yes	Yes	Yes
28. Movement of pathogens from an approved laboratory to another requires a license	Yes	Yes	Yes
29. Standard Operating Procedures covering all areas must be available	Yes	Yes	Yes

(source: OIE)

Annex 9: Environmental Management Guidelines for Civil Works Contracts

All contractors are required to use environmentally acceptable technical standards and procedures during the implementation of construction of works. All construction contracts will contain the following requirements:

- Take necessary precautions against negative impacts on the environment, any environmental damage or loss through prevention or suppression measures (where it is possible), instead of liquidation or mitigation of negative consequences.
- Observe all national and local laws and rules on environmental protection.
- Identify officers responsible for the implementation of activities on environmental protection conforming to instructions and directions received from the construction and design or environmental protection agencies.
- Minimize dust, smoke and particulate emissions to avoid or minimize negative impacts on air quality.
- Provide pedestrian crosswalks and roads to ensure access to public places.
- Prevent or minimize vibrations and noise from the operation of vehicles and machinery during construction activities.
- Minimize damage to natural setting and vegetative cover and assure vegetation recovery.
- Protect surface and underground water from pollution sources. Assure adequate water collection and distribution.

Annex 10: Attendance sheet for the public briefing meeting





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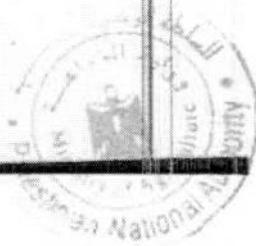
Project Implementation Unit

Attendance sheet
 Consultation meeting for the West Bank and Gaza Avian Influenza
 Prevention and Control Project Environmental Management Plan

Date: 15th Aug, 2007

Location: Rocky Hotel/ Ramallah

No.	Name Of Participants	Job Title	Name of Organization	Contact information	Signature
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1-9-2007

Ref : 2340

To: His Excellency Dr. Fathi Abu Mugli
Minister Of health
Head of national Committee for AI Control (NCAIC)

Ref: Avian Influenza Prevention and Control Project (AIPCP)
Grant Number: TF 057369

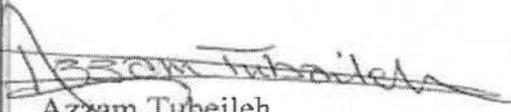
Subject: Environmental Management Plan (EMP)

Dear Dr. Fathi

Kindly find the final approved version of the EMP which was done by a UNDP Expert with complete cooperation, coordination and consultation of Ministry of Health experts, Ministry of Agriculture experts and Environmental Quality Authority experts.

You are kindly requested to send a letter addressed to the UNDP and the World Bank, to indorse the Environmental management Plan as a legal document to be used as a guide in case of AI outbreaks.

Best Regards


Azzam Tubeileh
Deputy Minister.

