

ACTION PLAN OF ANIMAL HUSBANDRY

FOR

PREPAREDNESS, CONTROL AND
CONTAINMENT
OF AVIAN INFLUENZA



सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
DEPARTMENT OF ANIMAL HUSBANDRY,
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List of abbreviations used in the Action Plan

Sl. No.	Abbreviation	
1.	ASCAD	Assistance to States for Control of Animal Disease
2.	CDDL	Central Disease Diagnostic Laboratory
3.	CVO	Chief Veterinary Officer
4.	DADF	Department of Animal Husbandry, Dairying & Fisheries
5.	DAHO	District Animal Husbandry Officer
6.	DC	Deputy Commissioner/ District Collector
7.	DIO	Disease Investigation Officer
8.	FAO	Food & Agriculture Organization
9.	FMD-CP	Foot & Mouth Disease Control Programme
10.	GOI	Government of India
11.	HPAI	Highly Pathogenic Avian Influenza
12.	HSADL	High Security Animal Disease Laboratory
13.	NAI	Notifiable Avian Influenza
14.	OIE	Office International des Epizootics (World Organization of Animal Health)
15.	POP	Post-Operation Protocol
16.	POSP	Post Operation Surveillance Plan
17.	PPE	Personal Protective Equipment
18.	RDDL	Regional Disease Diagnostic Laboratory
19.	RRT	Rapid Response Team
20.	VO	Veterinary Officer
21.	WHO	World Health Organization

Action Plan

Introduction

India remained free from Avian Influenza till mid-February 2006. Avian Influenza has been circulating for centuries with four known outbreaks recorded in the last century itself. The present wave of Avian Influenza commenced in Hongkong in 1997. The first outbreak in India occurred in 2006 and was notified on 18th February 2006. In view of the global threat of outbreak of Avian Influenza and apprehensions of a human pandemic sounded by international organizations like World Health Organisation (WHO), World Organisation of Animal Health (OIE), and Food and Agricultural Organisation (FAO) etc. it was necessary to take steps to ensure preparedness in case of an outbreak. As part of this preparedness the Department of Animal Husbandry, Dairying & Fisheries, Government of India (DADF) had prepared an Action Plan. The Draft Plan was discussed in a meeting held with the State Secretaries of Animal Husbandry under the chairpersonship of Secretary DADF in New Delhi on 26th October 2005 and thereafter circulated to the States by letter dated 16th November 2005. This document proved to be very useful in conducting the Avian Influenza control operations in the States of Maharashtra, Gujarat and Madhya Pradesh.

It was considered necessary to make amendments in the Action Plan. The experience of containing the outbreak in India indicated gaps in the existing Plan in certain areas such as handling backyard poultry etc. which were required to be covered to facilitate control operations. Further the existing provisions required elaboration and amendment based on the outbreak handling experience. The Government of India has been issuing guidelines from time to time and especially after outbreak of Avian Influenza to the States on various issues. The revision of the Action Plan enabled consolidation of these guidelines. Therefore, the exercise of amending the Action Plan has been undertaken and the revised and updated Plan has now

been prepared by the Government of India for the guidance of the States to handle Avian Influenza in case of outbreak.

It is to be appreciated that several phase-wise opportunities exist to intervene moving from a pre-outbreak phase through suspicion of an outbreak to confirmation of Notifiable Avian Influenza (NAI) outbreak and culminating in other bio-security measures till freedom from disease is established. The Action Plan describes the step-by-step strategic actions that can be undertaken to handle an outbreak of Avian Influenza and to capitalize on each opportunity to intervene. This Action Plan for the State Governments consists of four parts. Part I advises States on pre-outbreak preparedness. Part II indicates the action to be taken in case of any suspicion of occurrence of Avian Influenza at any place. Part III describes the actions in the event of the outbreak of the disease being confirmed by laboratory tests. Part IV provides advice on bio-security measures and to persons who may be required to handle NAI infected poultry, etc.

The strategy of the Government of India is to contain the disease at source i.e. at the level of the animal itself. This is the principal way to reduce opportunities for spread of the disease and for possible human infection. Therefore, disease intelligence, active animal surveillance, strengthening the Early Warning System in the pre-outbreak stage and total culling in prescribed radius resulting in rapid containment in the outbreak phase are critical aspects to reduce such opportunities for spread of infection.

The States/UTs are strongly advised that the spirit of extreme caution in which this has been prepared should be fully appreciated and they must ensure that this does not in any way create any scare particularly among the producers and consumers of poultry. Special care should be taken to see that baseless rumors and suspicion are not allowed to spread and mislead the people.

It is clarified that poultry covers not only chickens, but other domesticated birds like ducks, geese, turkeys, guinea fowls, quails etc.

I. Pre-outbreak preparedness

I.1 Surveillance : - Need to be in a state of alertness and preparedness

I.1.1 Surveillance to include both poultry and migratory birds

Surveillance is the most important part of the strategy to control and contain Avian Influenza. India has a poultry population of nearly 481 million, both commercial and backyard. About 60% of the population is in the commercial sector. It is indicated that the migratory birds play a role in the spread of the virus across countries and continents, though this is not conclusively established. India lies within three major international flyways of migratory birds. The season of arrival of migratory birds normally commences sometime in September each year and these birds are known to stay in India nearly till the end of March. Surveillance will, therefore, have to include both poultry and migratory birds.

I.1.2 Poultry owner is responsible for reporting unusual mortality and sickness in birds

Poultry owner, especially commercial poultry owners including consultants, franchises, service-providers and those related to rearing poultry in one way or the other are individually and collectively responsible to immediately report unusual mortality and sickness in birds to the Government. Failure to do so is gross negligence with serious implications for animal and human health. Social responsibility requires immediate reporting of such mortality to nearest veterinary institution so that process for early disease verification can be initiated.

I.1.3 Routine Surveillance

A system of taking random samples of poultry from different parts of the States for the purpose of surveillance against bird flu has been in vogue for sometime. Surveillance of migratory/ wild birds visiting sanctuaries/ water bodies etc. is also being undertaken. This programme of routine surveillance will continue.

The State Governments are advised to develop routine surveillance plans. These may be prepared by taking a Tehsil / Taluka as a geographical unit of planning and taking into account the following factors:

- a. Population density of poultry birds in each tehsil both in backyard and commercial.
- b. Areas of poultry concentration.
- c. Fly-way of migratory birds.
- d. Existence of wild-life sanctuaries / National Parks etc./ water bodies visited by migratory/ wild birds.
- e. Population of ducks/geese etc.

The Commissioner/ Director, Animal Husbandry shall coordinate with the Wild Life wing of the Forest Department of the State while preparing the routine Surveillance Plan. The Department of Animal Husbandry and the Forest Department of the State will be responsible for coordinated surveillance in accordance with the State Plan. The Chief Secretaries are advised to periodically review the surveillance by the two Departments.

Representative random sampling may be done in case of routine surveillance. Such samples may be cloacal, tracheal swabs and serum. While carrying out surveillance in respect of wild and migratory bird, the fresh droppings may also be collected by field functionaries of the Forest Department and dispatched to laboratories.

I.1.4 Active and targeted surveillance

In addition, a system of active and targeted surveillance has been initiated. It includes immediate response to unusual sickness/mortality and surveillance of migratory / wild bird areas especially those having poultry concentrations around them.

I.1.4.a Immediate response to unusual sickness and mortality in birds

As provided under I.1.2 the poultry owner is responsible for reporting unusual mortality etc. in his flock. In addition, the field veterinary institutions shall ensure detection and reporting of any unusually high mortality and sickness in poultry and wild birds etc. within 24 hours of its occurrence. Regular visits to high density poultry units (backyard and commercial) by veterinary doctors is a must for this purpose. The Chief Veterinary Officer (CVO) of the District/ District Animal Husbandry Officer (DAHO), or by whatever designation he is known, and the entire machinery of the Animal Husbandry/Veterinary Department in every district should remain in a state of full alertness and preparedness. All Veterinary Officers in the district (Government, Semi-Government or private) should report to the CVO/DAHO on phone, fax or e-mail, in case they notice above average mortality or any unusual sickness which cannot be readily diagnosed in poultry as well as wild and migratory birds.

Similarly the Forest Department is required to continue maintaining vigilance regarding any unusual mortality in birds, especially wild and migratory birds, in sanctuaries etc. in the District and report any such suspicion/unusual mortality/sickness in relation to the birds in the sanctuary immediately to the Senior Forest officials and the State Animal Husbandry Department.

As far as possible, public awareness about unusual mortality and sickness in poultry birds should be created so that informal and

supplementary means for getting information about unusual mortality and sickness in avian species can be developed which will assist in carrying out physical and clinical surveillance. This can be done through various means such as IEC campaigns for poultry farmers, holding Gram Sabhas in rural areas etc. Such awareness can also be created through print and electronic media. However, due care should be taken that no situation of panic is created.

I.1.4.b Integration of strategy for surveillance of poultry and wild/migratory birds

An integration of strategy of surveillance of poultry and wild / migratory birds requiring co-ordination between State Departments of Animal Husbandry and Forests is necessary. Such an approach has been suggested to the State Governments by Government of India by letter dated 23rd May, 2006. The Chief Secretaries of all the States need to intervene to coordinate the strategy for surveillance at their level. As a first step, the Forest Department of the State should prepare details of the areas visited by wild/ migratory birds. Simultaneously, the Department of Animal Husbandry should prepare details of areas of poultry concentration. The two Departments would then be required to consolidate the data so obtained and use it further to demarcate and identify the areas visited by wild/ migratory birds with poultry concentration in and around such areas. These are the core and critical areas for carrying out surveillance. It would be desirable to draw up lists of areas mentioned above and indicate them on a State map for further circulation to all concerned. A copy of the lists and maps prepared by the State Governments may also be forwarded to the Government of India. By conducting the above exercise the State will be able to define areas requiring immediate and integrated surveillance. This would also help High Security Animal Disease Laboratory (HSADL), Bhopal to set up priorities for testing. It would also be appropriate to utilize this opportunity to update the census of poultry in the State.

I.1.5 List of species affected by NAI

The list of species affected by Avian Influenza with referenced reports of Highly Pathogenic Avian Influenza (H5N1) in wildlife and domestic birds downloaded from National Wildlife Health Center is at Annexure I.

I.2. Sample Collection, Packing & Transportation

I.2.1 Attention to quantity, quality of samples etc.

Large numbers of samples are received by HSADL, Bhopal from almost all over the country. It has been emphasized repeatedly and particularly in the Video Conferences held with all the State Governments/ UTs in the month of March and April 2006 that the States/ UTs must ensure proper collection, packing and transportation of samples, and give particular attention to the quantity and quality of samples forwarded to the laboratories as contained in succeeding paras.

I.2.2 Guidelines for collection, packing & transportation

States should adhere to the following guidelines in this regard:

i) States/ UTs must distinguish at their level between unusual mortality/ sickness and normal incidence of mortality and sickness in poultry. Samples in all situations of mortality and sickness, usual or unusual, are being sent to Bhopal by the States after outbreak of Avian Influenza. The States should forward samples in case of unusual mortality / sickness raising suspicion of Avian Influenza immediately to HSADL, Bhopal under intimation to Animal Husbandry Commissioner, Joint Secretary (Animal Health), Joint Commissioner (Livestock Health), Government of India. But the samples in case of normal incidence of mortality/ sickness can be referred to regional/

state laboratories. If required, the concerned regional/ state laboratory can further forward them to HSADL, Bhopal.

ii) Representative/ random sampling may be done from an area especially in case of routine surveillance. Four (4) to five (5) samples in all which could be cloacal, tracheal and serum from a particular farm should be sufficient in most situations. Some States have forwarded 30 to 90 and in a few cases above 100 samples from the same farm. Bhopal received 4600 samples in one week ending 12th April, 2006 resulting in heavy pendency of samples at HSADL bringing it under stifling load. The samples should ensure representative sampling of the area and of the type of poultry (commercial/ backyard) in that area.

iii) It is absolutely necessary to ensure the quality of the samples being sent to Bhopal Laboratory. Several samples being received at Bhopal are either contaminated or putrefied. In some cases the dead birds and morbid materials were maggoted. This can result in contamination of the laboratory and foul smell and even force the management to shut down the laboratory for some time for decontamination thereby delaying further testing in the laboratory.

iv) The samples should be packed in isotonic phosphate buffered saline (PBS), pH 7.0-7.4 containing antibiotics or tissue culture medium and dispatched on ice.

v) The samples should be packed area-wise. For example, samples from one village should be packed together so that, if required, testing of samples is facilitated by pooling. Empty boxes were received by the laboratory on a few occasions. Inevitably the efficiency and effectiveness of testing will be affected in such a situation.

(vi) It is imperative that the cold chain is maintained while

dispatching the samples. More than 2000 samples had to be discarded in the recent past because of non-maintenance of cold chain. This affects proper diagnosis of samples in the laboratory and adds to the secretarial work at the laboratory.

vii) The samples should be accompanied by the proforma prescribed by this Department for referring clinical material to HSADL, Bhopal for diagnosis of Avian Influenza forwarded with letter dated 17th March, 2006 and placed at Annexure II (also available on departmental website <http://dahd.nic.in>). Samples being sent to Bhopal should carry details of area, place etc. so that it is possible to identify the place from where the same originated especially in case any of the samples test positive. It was found in some instances that the details in the covering letter sent with the samples do not match the samples found in the boxes.

HSADL, Bhopal has been advised not to accept/ put to test samples, which are deficient in above aspects.

I.2.3 States to contact Government of India for information

It is strongly advised that State Governments should not attempt to obtain results directly from HSADL, Bhopal and should forward their queries regarding the test results of samples to DADF. Periodic information of samples (i.e. samples received, tested and pending) is posted on the Departmental website (www.dahd.nic.in), which can be accessed by the States directly. Direct queries by States to HSADL, Bhopal consume time, effort and energy and this is best avoided in the event of an outbreak where the laboratory becomes heavily burdened. As per existing protocol, HSADL is to communicate the results of testing of samples to DADF (Secretary/ Animal Husbandry Commissioner/ Joint Secretary) only since Department of Animal Husbandry, Dairying & Fisheries, Government of India alone is empowered to notify an outbreak of Avian Influenza.

I.3 Role of District Collector/Deputy Commissioner

Control operations require co-ordination of activities of several agencies especially at district level. District Collector/Deputy Commissioner has to play a central and co-ordinating role especially concerning aspects of quarantine, closure of shops, compensation (payment and verification), movement control, ban on sale of poultry related products, administering and developing vaccination plan, clean-up, maintaining supply lines for equipment etc. Therefore, District Collectors/Deputy Commissioner should be thoroughly familiarized with the Action Plan to enable them to assume responsibility of co-ordination of control & containment operations in case of outbreak. Other revenue officials should also be familiarized with all aspects of Action Plan to assist the District Collector/Deputy Commissioner. Staff of Departments like Animal Husbandry, Human Health, Environment & Forest etc. is of course required to be trained intensively in respective sectors.

I.4 States to check availability of legislative framework

The State Governments should check the legislative framework that is available to enforce restrictions during suspicion of Avian Influenza and in case of confirmation of Avian Influenza as contained in succeeding paras.

I.5 Rapid assessment of Preparedness

In order to facilitate immediate action in case the samples test positive and an outbreak is confirmed, the State Government should rapidly assess its preparedness to carry out operations. Such assessment would be most effective if carried out at level of Chief

Secretary with Secretaries and Heads of all concerned Departments. The Check-List for Preparedness, Control & Containment of Avian Influenza at Annexure III and Immediate Points to be Handled if Outbreak is Confirmed at Annexure IV can be made the basis for such assessment. States can add to the Check-List and continually upgrade it as per local requirements.

I.6 Stocking and Sourcing of equipments / instruments / machinery etc. required for conduct of operations.

Several kinds of equipments/machinery such as gunny bags, plastic sheets, plastic bags, slack lime and quick lime, sodium hypochlorite, formalin, sodium Phenobarbital, automatic vaccinators or syringes and needles, spray pumps suitable for crops, spray pumps suitable for spraying at height such as on trees etc, fogging machines, jetting cum suction machines, gum boots, PPE kits, JCB machines, flame guns, LPG cylinders, fire wood, kerosene and coal etc., are required for the conduct of operations. The States are advised to develop reserves of critical equipments such as PPE, Sprayers, foggers etc; determine source of supply especially in case of emergency, ensure ability of suppliers to provide equipment/materials throughout an outbreak as per requirements and finalize procedural/financial formalities well in advance. Vehicles and machinery may have to be hired in situation of outbreak. An illustrative list of instruments/equipments/other materials required in AI operations is at Annexure V.

II. Steps to be taken in case of suspicion of outbreak of Avian Influenza

II.1 CVO/DAHO to visit the site immediately on receipt of preliminary information

In case of suspicion of outbreak of Avian Influenza such as receipt of any preliminary report regarding unusual sickness or above average mortality of poultry as well as wild and migratory birds at a place from any other source whatsoever, the CVO/DAHO/ Disease Investigation Officer (DIO) shall visit that place immediately and not later than 24 hours and personally ascertain the circumstances and facts of the case.

II.2 Veterinary officers to be provided with kits etc.

The Investigation Officer should be equipped with a 'kit' (indicated in Annexure VI) so that he is in a position to conduct preliminary and clinical investigations and, if necessary, collect required samples for dispatch for laboratory analysis. The State Departments of Animal Husbandry should ensure that all the veterinary officers and disease investigation officers of the Department are equipped with the essential kit (Annexure VI). All investigation officers who are required to visit places where birds are kept, should wear the personal protective equipment (PPE) (details given at Annexure VII). It must be ensured that PPE is discarded in the suspected farm prior to departure and disposed off by burning. Two or three fogging/ spraying machines and several sets (at least 10) of essential kit should be carried to all suspected places. The office of every CVO/DAHO should have at least five fogging/ spraying machines and fifty sets of protective clothing as per details at Annexure VII.

II.3 Preliminary and clinical investigations by DIO

II.3.1 Protective gear & equipment for DIO

The DIO must wear his protective gear in a room designated as the changing room for convenience of reference prior to entering the suspected premises, and must leave the following items from the kit in the changing room :

- (i) Leak proof water resistant container;
- (ii) Thermic container (ice box) for carrying samples;
- (iii) Two pairs of latex gloves;
- (iv) Five autoclavable plastic bags;
- (v) Five black rubbish bags;
- (vi) Disinfecting solution.

The remaining components of kit must be carried inside the premises.

II.3.2 Information to be collected

The CVO/DAHO and DIO should collect the following information:

- (i) Preliminary identification of the production unit and subunits including topography of the farm and identification of the specific unit for which the suspicion has been reported;
- (ii) Number of birds and other animals on the farm;
- (iii) Identification of staff as well as vehicles directly involved with that unit;
- (iv) Recent movement of people, equipment, vehicles and animals/ birds;
- (v) Availability of disinfectants and equipment for disinfecting the premises on site;

- (vi) Anamnestic data (data relating to immune response).

II.3.3 Epidemiological Inquiry Report

The DIO should carry out a clinical investigation with the aim to establish the clinical situation on the farm, including ill and suspect birds. The clinical investigation must be performed on all susceptible species present on the farm, and it must begin from the most peripheral units. Particular attention must be paid to any vaccinations performed. All this information must be reported in the epidemiological inquiry report (Annexure VIII). While filling in the epidemiological inquiry form, it is important to ensure inter alia that:

- (i) Animal or poultry movements are recorded up to 20 days prior to the onset of the first clinical signs;
- (ii) Movement of all people (staff, relatives, servicing personnel, veterinarians etc.) who had access to the farm must be recorded;
- (iii) All vehicles, regardless of their contact with animals, which have had access to the farm must be reported.

The epidemiological inquiry report must be sent (faxed or e-mailed) to the Secretary/Director of Animal Husbandry of the State and Government of India. All the birds present PER SPECIES must be identified, and for each species identified, a report containing the date of onset of clinical signs, description of clinical signs and reported percentage mortality must be prepared.

II.3.4 Actions after investigation

If the preliminary and clinical investigations indicate that it is an unusual situation indicating suspicion of Avian Influenza, then the CVO/DAHO has to ensure that steps as indicated in the subsequent paragraphs are taken immediately. If the investigations show that avian influenza is not suspected, adequate local publicity should be

given for the same so as to reassure the poultry farmers and general public.

II.4 Collection of samples and dispatch for laboratory tests

II.4.1 Type of samples to be sent to laboratory

The following pathological samples must be collected to be sent to HSADL, Bhopal (till adequate capabilities in this regard are created in other laboratories like the Central Disease Diagnostic Laboratory (CDDL) and the Regional Disease Diagnostic Laboratories (RDDL's):

- (i) At least 5 diseased birds (either dead or acutely sick birds after killing them) for post mortem examination;
- (ii) Pooled tracheal and lung samples from at least 5 diseased birds;
- (iii) Pooled intestine samples from at least 5 diseased birds;
- (iv) Cloacal and tracheal swabs collected normally from 30 healthy birds and in any case not less than 10 birds. Swabs must be collected ensuring that at least one gram of faecal material is actually on the swab and must be subsequently immersed in virus transport medium (PBS or tissue culture medium);
- (v) At least 10 blood samples (acute sera).

Samples must be packaged appropriately (in leak proof containers, wrapped in at least two plastic bags), to avoid dissemination of the infectious agent, and transported in a cold chain to the laboratory inside a polystyrene box (ice box) containing icepacks. The polystyrene box must be appropriately disinfected before leaving the

premises. The samples must be accompanied by the appropriate form (see Annexure II). Following collection of samples the DIO and his assistants should change their protective gear in the designated changing room and dispose it off within the premises prior to departure as explained above, collect all sterilizable equipment in an autoclavable bag, which is sealed and inserted into a second bag, which is disinfected externally. All single use materials, sheets of paper, disposable gear and shoe-covers are burnt.

II.4.2 Samples should be sent to the laboratory immediately and information provided

These samples must be collected and a special messenger should leave for Bhopal within 24 hours after the CVO/DAHO/Forest officer and DIO reach the spot. Regarding the dispatch of the sample through a special messenger, the CVO/DAHO may inform the State Secretary/ Director of Animal Husbandry on phone. There should not be any need to get any written permission, as it has to be ensured that the samples reach Bhopal as early as possible. To cut short the delay the special messenger should be allowed to go by air, wherever necessary. DADF, Government of India should be informed immediately to enable it to set priority for testing at Bhopal and also to monitor the situation and take further action as per situation. As regards the Department of Animal Husbandry, Dairying & Fisheries, Government of India, the Animal Husbandry Commissioner (AHC) [Dr. S.K. Bandyopadhyay Tel : 011-23384146 (O) 011-26116128 (R)], Joint Secretary (AH), GOI [Mrs. Upma Chawdhry (Tel : 011-23387804 (O), 011-26115375 (R)], or Joint Commissioner (LHS), GOI, [Dr. A.B. Negi Tel: 011-23384190 (O) 011-26183834 (R)] may be contacted. HSADL, Bhopal has been requested to complete all tests at the earliest. In order to enable HSADL, Bhopal to receive the samples for carrying out the tests as soon as the samples reach there and also to arrange temporary stay of the special messenger,

telephonic intimation regarding dispatch of sample should be given to them at the earliest. (Telephone no. of HSADL, Bhopal is 0755 2759204 and fax no. is 0755 2758842).

II.5 Immediate report to Director, Animal Husbandry, District Collector and others

The CVO/DAHO shall immediately report by telephone, fax or e-mail the matter to the State Secretary/Director, Animal Husbandry and District Collector as well as to other officers of the Revenue Department like the Sub Divisional Officer, Tehsildars etc. The District Administration and State Department of Animal Husbandry will then proceed to take action with regard to enforcement of restrictions indicated below.

II.6 Identification of alert zone

An area with 10 km radius from the affected place should be identified as the alert zone. All villages and habitations within that area should be identified. The Panchayat authorities, civil and veterinary officials in those areas should be alerted about the possibility of avian flu and requested to strictly enforce the restrictions mentioned below.

II.7 Restrictions to be enforced at the site and the alert zone pending receipt of test reports

II.7.1 Restriction in alert zone

Pending receipt of the test results, the entire suspected farm or site should be cordoned off and following restrictions should be immediately brought into effect in the alert zone by the District administration with assistance of the Animal Husbandry Department etc:

- (i) No vehicles should be allowed to ply in and out of the affected farm/site. Personal vehicles should be left outside the farm premises.
- (ii) No movement of poultry, eggs, dead carcass, manure, used litter, farm machinery, equipment or any such material should be allowed both within the alert zone and to outside the zone.
- (iii) The farm personnel should wear protective clothing all the time inside the farm, including face-masks and gloves, gumboots (or shoes with disposable covers) etc. While leaving the farm premises, farm personnel should leave the protective clothing etc at the farm and clean themselves thoroughly with suitable disinfectants.
- (iv) Movement of people to and from the suspected farm should be restricted to the barest minimum. No other animals should be allowed in the farm.
- (v) Inter-sectional movements of farm personnel should be banned. They should not visit any other poultry farm, bird sanctuary, zoo etc.
- (vi) Disinfection procedures should be strictly applied at the entrance of the premises.
- (vii) All records of birds present at the farm are to be maintained properly.
- (viii) Before the test results are received, the possibility of closing the markets and shops in the area may be explored by the District Collector/subdivisional officer/revenue authorities in consultation with the State Animal Husbandry Department, particularly if more farms become suspect during this period.

II.7.2 Information to poultry farmers

The poultry farmer (farmers) at the suspected site should be informed of the restrictions and personal security measures and should be requested to comply with the same strictly. While these restrictions should be enforced strictly, it should be ensured that this does not create any scare; for this purpose the help of Revenue, Panchayat, Municipal authorities and also the media should be sought.

II.7.3 Collect information pending receipt of results

Pending receipt of the test results, the DAHO should arrange to record mortality or sickness of birds at the suspected site and the alert zone. During this period, he should also arrange to collect information about the total poultry population (with details of age) and population with individual poultry farmers (both backyard and commercial) separately within a radius of 3 kms and between 3-10 kms from suspected site.

II.7.4 Action if laboratory diagnosis is negative for NAI

The restrictions mentioned above should, of course, be abolished if the laboratory diagnosis proves to be negative for NAI. However, if the above average mortality or disease situation continues, the cause of this should be got established through other necessary tests and appropriate remedial action taken.

II.7.5 Action by Forest Department in bird sanctuaries etc.

In case the suspected site happens to be a bird sanctuary, the actions indicated in paragraphs II.1 to II.7 are to be undertaken by the Forest Department with assistance of the Animal Husbandry Department, where required.

II.8 Naming a Veterinary Officer as the designated officer

Before leaving the place, the CVO/DAHO shall nominate a fairly senior and knowledgeable veterinary officer of the Department serving in the area as the designated officer for co-ordination and other necessary actions. Similar responsibility is to be fixed by the Forest Department in areas under control of Forest Department.

III. Action Plan in case outbreak of NAI is confirmed

III.1 Notification & Information of outbreak

III.1.1 Notification of Outbreak by DADF, Government of India

In case laboratory tests confirm the occurrence of Notifiable Avian Influenza (NAI), HSADL Bhopal will inform the Government of India i.e. DADF which in turn will declare an outbreak of Avian Influenza in the area through a communication addressed to the Chief Secretary of the State. Control and containment operations will be initiated immediately thereafter. The Government of India will dispatch the Central Rapid Response Team (RRT) of Department Animal Husbandry, Dairying & Fisheries, if situation so warrants or if specifically requested for by the State Government. The Central RRT will provide technical assistance and guidance to the State Government in conduct of operations

III.1.2 Reporting of the outbreak

The Chief Secretary/ Secretary Animal Husbandry of the State will obviously have to bring the matter to the notice of the highest authorities of the State Government for their guidance and appropriate intervention. All the concerned agencies including local public and others are to be notified about the outbreak at appropriate levels. It is, however, clarified that the international agencies are to be notified by the Department of Animal Husbandry, Dairying and Fisheries, Government of India only.

III.1.3 Notification to health authorities

In view of the threat of human infection from particular strains of

NAI, public health authorities are to be immediately notified. DADF will inform the Ministry of Health & Family Welfare (MOHFW), Government of India at its level. MOHFW will in turn activate the State Health Departments at its level. The State Animal Husbandry Department should also notify the State Health authorities at its level. This should be done at the level of CVO/DAHO and the Director/Secretary, Animal Husbandry at appropriate levels.

III.2 Implementation of all contingency procedures under co-ordination of District Collector/ Deputy Commissioner

Once the occurrence of NAI in a particular area is notified by the Government of India, all contingency procedures for the containment and eradication of NAI should be implemented at once. Many immediate steps will have to be taken as indicated in the succeeding paragraphs in addition to continuing and intensifying all the restrictions mentioned in para II.7.1. The responsibility for this purpose shall vest with the District administration under the overall control of the District Collector / Deputy Commissioner with the technical assistance of the Departments of Animal Husbandry, Human Health, Forest etc. as per situation. The CVO/DAHO, will of course, act as the supervisory officer for operations on the animal health side. In case the infected area happens to be a sanctuary of birds etc. the steps should be taken by the State Forest Department. There will, however, be no need to provide any compensation as mentioned in paras III.12 in respect of the birds, if any, in the sanctuary to be destroyed.

III.3 Pre-requisites to launch operations

III.3.1 Control Room

The first pre-requisite is to set up a 24 hrs Control Room within

infected area equipped with telephones with STD facility, fax machines, computers with internet access, secretarial assistance etc. Personnel deployed in the Control Room should have the articulation and capacity to disseminate comprehensive information. It is likely that the Control Room may be contacted as source of information by several agencies including the Government. Conduct of operations has shown that the Control Room becomes the nerve centre for the entire operation against the disease.

III.3.2 Other Pre-requisites to launch operations

Other pre-requisites to launch the operation are Rapid Response Teams (RRT), Personnel Protective Equipment (PPE) with antiviral drug (Oseltamivir) and stockpile of vaccines and sanitization materials for dis-infection.

III.3.3 Rapid Response Teams (RRT's)

The Animal Husbandry RRTs will be responsible for operations like culling, disposal, vaccinating, supervising & undertaking clean-up & dis-infection etc. Separate RRT's are set up for human health surveillance by the Health Ministry/ Department. Since manpower requirement to conduct operations can be large especially in case of multiple outbreaks it is advised that all the veterinary and para-veterinary and other related personnel of the State Animal Husbandry Departments are trained in the control and containment of Avian Influenza by the States. Simultaneously capability should be developed for supervisory operations to enable veterinarians to assume leadership in an outbreak.

The States are advised to check following issues as part of preparedness:

- i) Total number of RRT's required to be set up in the State, which is

to be determined on the basis of the poultry population, its size, concentration and type.

- ii) The composition of the RRTs may vary as per the task to be performed. For example, the RRTs for culling and also for vaccination will comprise largely of veterinarians and paravets assisted by Class IV staff etc. RRT's of both cullers and vaccinators will be required, in case vaccination is to be introduced. The RRTs for clean up and disinfection will function under the overall supervision of veterinarians/paravets and comprise of Class IV employees, labour, etc.
- iii) Ideally, the team of cullers or vaccinators must be so decided that the work can be completed in the shortest possible time.
- iv) Manpower has to be mobilized to ensure that control operations are started immediately after notification of Avian Influenza. Therefore, time required to mobilize RRT's to outbreak areas is an important element of planning.
- v) A detailed Plan on actual deployment of RRT's to begin and conduct operations should be developed to ensure that tasks of culling, vaccination, clean-up, dis-infection etc. are conducted in a co-ordinated and organized manner.
- vi) Attention must be paid to availability of infrastructure so that it is possible to organize boarding & lodging for RRT's.
- vii) Man power may also have to be mobilized from other districts in certain situations as per requirement. The Commissioner/ Director of AH will be responsible for such mobilization which should be so coordinated that RRTs do not reach later than the day specified for reporting or too early resulting in wasteful expenditure on their boarding & lodging.

III.3.4 Personal Protective Equipment (PPE)

PPE is very important in conduct of operations as it provides personal safety to the members of the Rapid Response Teams. PPE is to be used by RRT's of the Departments of Animal Husbandry, Public Health and all persons having direct & active exposure to infected poultry. Workers/ labor force will also have to be engaged at some stages of the operation especially for clean-up and dis-infection. They are also to be provided with PPE. It has to be ensured that persons are allowed to take up control and containment only after being provided with PPE & anti virals. Operations should not be allowed to be started without use of PPE & anti virals. Large quantities of PPE's have been used in operations in Maharashtra, Madhya Pradesh and Gujarat in recent outbreaks. The States are required to ensure the following:

- i) Availability of sufficient stock of PPE prior to start of operations and during operations.
- ii) Tie-up for regular supplies during operations
- iii) PPE is a single use-item and has to be changed every time a person moves from one infected premise to another.
- iv) Prior to start of operations, briefing must be given on importance of kit, its use/ disposal etc.
- v) Kit has to be disposed off by burning on exiting a farm premises.

The composition of the kit is at Annexure VII. Two types of kits have been prescribed viz for direct handlers and other than direct handlers. The main difference in the two kits is the type of mask used. The face-mask with filter is necessary for direct handlers i.e. cullers and others having direct exposure to infected poultry.

A sequence is recommended for wearing and removing the PPE. This has been suggested keeping in view the modified PPE kits prescribed by GOI.

The sequence for wearing the PPE is as under:

1. Wear shoe cover
2. Wash hands
3. Wear 'Dangri'
4. Put on the face mask/ mask with hepa filter (N95 standard)
5. Fix protective glasses over eyes (goggles)
6. Fix hood over head
7. Put on gloves

The sequence of removing PPE should be followed as below

1. Remove shoe covers
2. Remove house gloves
3. Wash hands
4. Remove 'Dangri' with attached hood
5. Remove disposable protective glasses (goggles)
6. Remove face masks (for other than direct handlers)/ face mask with hepa filter, N95 standard (for direct handlers)
7. Discard all
8. Wash hands

III.3.5 Safety of Personnel engaged in control operations

To evolve a public health policy in respect of influenza in humans due to involvement of Notifiable Avian Influenza (NAI) virus is beyond the scope of this document and will be done by the Public Health authorities. It is, however, pointed out here that the health of farm hands, attending veterinary officer, and other staff engaged in culling and disinfection of an infected premises should be under strict observation. Serological surveillance of exposed farm workers and veterinarians is encouraged. Manpower requirements to conduct AI operations are very large. Further man-power is required for various stages of control operations viz. culling, vaccination, cleanup, disinfection etc. Persons engaged in control operations have chances of exposure to infection though in varying degrees depending upon the

nature of the task performed by them. It is, therefore, of utmost importance to ensure the safety of such personnel. This can be done through pharmaceutical and non-pharmaceutical interventions and other measures as explained in succeeding paras.

III.3.5.1 Health check up of personnel before start of operations

Health-fitness of members of RRT must be ensured before deploying them. It is therefore, necessary to form the RRTs after a health check up of the employees.

III.3.5.2 Use of antiviral drug (Oseltamivir) : Pharmaceutical Interventions

Antiviral drug (oseltamivir) as a prophylactic is a pre-requisite for the personnel in direct contact with poultry to be taken as prescribed by public health authorities. Operations should not commence without PPE and antiviral drugs (oseltamivir). One tablet is to be taken for 10 days. It can be taken up to 6 weeks in case of continuous exposure. The Government of India, through RRT's of Public Health, supplies antiviral drug (oseltamivir) to all those engaged in operations including labour. All persons exposed to infected chickens or to farms under suspicion should be under close monitoring by local health authorities. Further details can be obtained from the "Contingency Plan for Management of Human Cases of Avian Influenza" also hosted on the website of the Ministry of Health and Family Welfare, (MOHFW), Government of India (www.mohfw.nic.in).

III.3.5.3 Non-Pharmaceutical Interventions

Other than use of PPE, non-pharmaceutical interventions include proper hand hygiene through regular & proper washing of hands etc.

Cullers and transporters should dis-infect their hands after the operation. A 10-day quarantine of all the personnel engaged in operations after last exposure to infection on completion of culling/vaccination/ cleaning operations must be enforced under medical supervision. Arrangements for boarding/lodging of such personnel during this period and payment of wage for the labor should be considered. Self-surveillance thereafter is strongly advised with quick reference to a health institution, governmental or private, in case of any flu-like symptoms or respiratory complaints etc. Environmental cleanup should be carried out in areas of culling using the same protective measures as above.

III.3.6 Imposition of legislative measures

All the existing legislative powers associated with notification of a disease should be exercised by the State Government. This is to be ensured by both the Animal Husbandry Department and Health Department and the State/ District Administrations.

III.4 Demarcation of Surveillance & Infected areas & actions to be taken in these areas

III.4.1 Declaration of Infected and Surveillance areas

An area of 3 kms radius around the infected site which should have been clearly identified as per para II.6 with names of all villages and habitations within that area shall be notified as the Infected Area by the District authorities. Information about declaration of the area with 3 km radius from the infected site as infected with Avian Influenza should be clearly and prominently displayed in the local language preferably through sign-boards. The area between the radius of 3 kms and 10 kms around the infected site should be notified as Surveillance Area. The Surveillance Area should act as a

buffer zone between infected area and disease-free area. In case vaccination is to be adopted, Surveillance Area will have to be targeted. The Government of India may in consultation with the State Government vary the radii of the Infected and the Surveillance zones as the situation warrants, as was done in the case of recent outbreaks in Navapur and Jalgaon.

III.4.2 Immediate tasks to be carried out by the Veterinary Officer on confirmation of outbreak

Access to the premises by the veterinarians must take place with PPE & antiviral drug (oseltamivir) as indicated above. A changing room must be identified, and it should contain large plastic bags, cardboard boxes and a sufficient quantity of disinfecting solution. The immediate tasks to be carried out by the designated Veterinary Officer will be to :

- (i) Quickly assess the state and condition of the farm/premises to determine the nature and scope of operations to be conducted.
- (ii) Identify locations on the farm where vehicles leaving the farm can be properly washed and disinfected.
- (iii) Activate the disinfection procedures at the point of entrance to/exit from the infected premises; identify sites where staff may wash and disinfect; and ensure that on leaving the premises, all staff, wash and disinfect exposed body parts and shoes and agree to wash their clothing as soon as they return home and the disposable gear is disposed off by burning.
- (iv) Ensure that vehicles are washed and disinfected internally and externally, and vehicles should be allowed to leave the infected premises only if it is absolutely necessary.

- (v) Take necessary steps to ensure that contamination of water reservoirs is avoided.

III.4.3 Absolute ban on movement of poultry

Movement of poultry i.e. live birds should be completely banned from and to the infected area by the State Government. Restocking of poultry in that area will commence not before three months after issue of Sanitization Certificate as per Para III.11 and with approval of Government of India. Effective measures and monitoring shall be undertaken to ensure that such restriction on movement of poultry is made effective. Local bodies, and representatives should be involved in enforcing such restrictions and public informed through various means of communication of the necessity of doing so.

III.4.4 Closure of poultry and egg markets and shops

All poultry products and egg markets/shops within the radius of 10 kms from the infected site should be immediately got closed forthwith by the State/ District administration with the assistance of the Revenue and Municipal /Panchayat authorities and shall remain closed till further orders. However, poultry and movement of poultry will be regulated in accordance with Para III.4.2 alone.

III.4.5 Ban on movement of farm personnel

Farm personnel in the 10 km zone should not be allowed to visit any other poultry farm.

III.4.6 Restrict access to wild and stray birds

All possible steps should be taken to ensure that wild and stray birds do not have access to the poultry, poultry sheds and water supplies in the infected area.

III.5 Access to the infected premises : Restriction of movement of persons & vehicles.

The number of vehicles and staff in the infected premises should be reduced to the minimum necessary to handle the outbreak as both human beings & vehicles can be instrumental in further spread of infection.

III.5.1 Restriction on movement of persons & equipment.

The movement of people and equipment from the infected premises should be restricted only to the requirements related to handling the disease. Proper disinfection procedures must be adopted even for this. Any staff that has access to the infected premises may only leave the farm after a complete change in clothing and disinfection and disposal of protective equipment.

III.5.2 Restriction on movement of vehicles.

The vehicles of the veterinarians and others visiting the infected premises must be left outside the premises at a distance of at least 500 meters from the entrance of the farm. If it is necessary for vehicles such as JCB's to enter the farm premises for control and containment operations, such vehicles will be fully dis-infected before leaving the farm/ infected premises. They will be dis-infected by washing them thoroughly and thereafter using dis-infectants.

III.6 Destruction of birds etc.

III.6.1 Eliminate diseased & in-contact birds

The entire stock of diseased and in-contact birds on the infected premises needs to be eliminated and destroyed. The means of

destroying the stock are given in succeeding paras.

III.6.2 Destruction of birds in the infected zone of 3 km radius (or as may have been prescribed) outside the initially infected farm

For effective control of the disease it will be necessary to stamp out all the birds within the infected zone even though the birds outside the initially infected farm may not be currently showing any symptoms of the disease. All such birds should also be destroyed. In case of culling, the actual culling should be started from centre towards peripheri and in case of vaccination, it should be started as ring vaccination from peripheri towards the centre.

III.6.3 Destruction in presence of designated officers

The destruction of birds should take place in the presence of the designated Veterinary Officer and concerned local authorities such as officials of the Revenue Department, Municipality, Panchayat etc. as may be determined. The presence of designated officers or any other appropriate authority for overseeing the culling and disposal of dead birds is necessary from the point of view of determining the compensation to be paid to the affected poultry farmers.

III.6.4 Depopulation

Depopulation of infected flocks may be done by decapitation and dislocation of the neck. The depopulation and disposal of infected birds must be performed bearing in mind that this needs to be done in the quickest time span possible to prevent spread of infection. Furthermore, they need to be performed with the doors of the shed/house closed to prevent access of wild birds and other animals to infected organic material. The means of destruction, whether decapitation or other methods, should be humane.

III.6.5 Equipment for depopulation

The equipment necessary for depopulation and disposal are :

- i) Wooden poles and plastic red-and white-tape to identify the infected premises and the entrance/exit of the farm;
- ii) Disinfectants;
- iii) Gas, drugs or devices to contain, sedate, stun and depopulate flocks;
- iv) Appropriate containers for disposing off infected material.

III.6.6 Drugs for depopulation

Drugs that may be used for depopulation of large flocks of birds are:

- a. Alfa chloralose, mixed to feed in concentration of 2%-6%, causes loss of consciousness, and death can be obtained by suffocating birds in plastic bags.
- b. Sodium Phenobarbital dissolved in drinking water (80 mg in 55 ml), causes loss of consciousness in 4 hours.

III.6.7 Strategy adopted in recent outbreaks in India to kill birds

The birds were killed by decapitation in the recent operations. On some farms before culling, the birds were sedated with sedatives like Sodium -phenobarbital, mixed with water. The medicated water was supplied to the birds in the morning at least 3 to 4 hours prior to culling operations. Birds were thereafter culled by decapitation method. The culled birds were packed in bags, which were later carried out for disposal to identified sites within infected farm premises.

III.6.8 Strategy for backyard poultry

In case of backyard poultry, deployment of a different strategy for culling of birds is advocated based on the observation that typically backyard poultry is let out in the morning for scavenging etc. An alternative strategy was developed in the recent operations. A public announcement was made a day before carrying out culling of birds asking poultry owners not to release the birds in the morning and that veterinarians would collect the birds the next morning against cash payment. Poultry owners were also advised to observe precautions such as cover face, nose etc. when handling the birds. The co-operation of the local bodies is necessary for backyard operations. A common ground was identified for the culling and disposal of the culled birds in consultation with the local bodies. The birds were collected by veterinarian / para-veterinarian in morning & carried to disposal sites. Procedure for disposal as contained in succeeding paragraphs was followed thereafter.

III.7 Disposal

It has to be ensured that the dead birds, eggs and other materials are not moved out of the infected site under any circumstances but are disposed off as explained in succeeding paras.

III.7.1 Disposal of dead birds

The birds killed in operations can be disposed off by burning in pyre or burial. Approximately 5 quintals of wood per 100 kg of dead birds would be required for burning. It should be ensured that carcasses are completely burnt. The other alternative is to dispose off birds by burial. For this, a pit must be prepared as soon as the diagnosis is confirmed. The size of the pit must be at least two meters long, two meters wide and two meters deep, and this enables disposal of about 1800 birds. If it is made one meter deeper the capacity increases to

3000 birds. It must be ensured that the pits are sufficiently deep. JCB machines were deployed in recent operations to dig pits. Burial should be such that the disposed material is kept well below the ground level to ensure that rodents or stray animals cannot access it. The carcasses must be covered with a layer of calcium hydroxide, and then with a layer of earth (at least 40 cm deep) thus alternating one with the other till the pit is covered upto the ground level. The burial ground is to be suitably marked and should not be opened for at least five years. The ground must be watched for settlement, if any and periodically filled with earth and lime if it shows signs of sinking over time. The method of burial was largely adopted in the recent outbreaks. Wherever possible the carcasses may be burnt/incinerated. A certificate of disposal of birds must be obtained from the verifying authority under Para III.6.3 above.

III.7.2 Destruction of infected materials

Infected material will include all the poultry products including meat, eggs and waste materials, like used litter, manure and other infected materials like feathers, feed, feed ingredients, manure, drugs and vaccines available on the infected farm premises. Such material must not be allowed to move out of the infected premises at all and are also to be destroyed at once including any material left over from the period before the disease was reported. For destruction of the infected materials, the following procedures should be adopted :

- (i) Waste, organic and all other non-disinfectable material present on the farm must be destroyed. In particular, destruction of litter, eggs, egg products, hay, animal feed/feed materials, feathers and egg-trays must be ensured. Depending on the quantity to be destroyed and characteristics of the farm, litter can be either buried in the pit with animal carcasses or burnt. Eggs/ Egg products may be buried in the pit with the animal carcasses.

- (ii) Straw may be more conveniently burnt.
- (iii) The crops grown in the farm should be uprooted and buried/ burnt.
- (iv) Animal feed/feed materials present on site must be burnt and buried.
- (v) The protective clothing used by the staff engaged in destruction of the birds should also be burnt.
- (vi) Feathers are to be disposed off. An efficient way of feather disposal is by use of flame guns.
- (vii) Water should not be allowed to accumulate in the farm premises and particularly in and around disposal sites.
- (viii) Other measures to dispose off any other material on infected premises may be taken in a manner that ensures the infected material is not taken out of the infected premises and is safely disposed off.

III.8 Clean up and dis-infection

Clean up & dis-infection is the last stage of control & containment. The infected premises are to be dis-infected after birds and infected material have been destroyed and disposed off. Different protocols may be considered for clean-up and dis-infection of commercial and backyard poultry as explained in succeeding paras.

III.8.1 Cleaning and disinfection of the farm premises and farm implements (Commercial Poultry)

The following procedure may be adopted for cleaning and disinfection of the premises and farm implements :

- (i) Washing and disinfection of walls, floors and ceilings of the infected establishments must be performed aiming at the removal of all organic material. All sheds in the premises should be cleaned which includes washing of

floors & walls with 3% calcium hydroxide solution; sprinkling of bleaching powder and lime on the floors of the sheds and farm areas; white-washing of concrete areas with lime; spraying the areas with 4% formalin; fumigation of closed chambers and sheds with Potassium permanganate (KMnO₄) and formalin; treating all equipments with 2% sodium hypochlorite solution for 48 hrs etc. Metal structures such as cages may be decontaminated by heat treatment.

- (ii) All units which are physically or functionally connected to the establishment (i.e. hatchery, egg storage rooms, packaging rooms, egg trolleys, egg product plants) must be properly disinfected. Vehicles, used for transporting live animals, eggs and animal feed must also be disinfected.
- (iii) All equipment inside the house such as drinkers and food hoppers must be washed and treated with a disinfectant for at least 48 hours.
- (iv) Water reservoirs must also be emptied, washed and disinfected.
- (v) Feed tanks (silos) need to be emptied, washed with a hot water-pressure pump and subsequently fumigated.
- (vi) After washing and disinfecting, all units must be fumigated twice with at least two weeks between fumigations.

III.8.2 List of active dis-infectants

A list of disinfectants which are active against Avian Influenza virus, their concentration and recommended use are mentioned below :

- (i) Rectified spirit or Savlon or Dettol (1 % solution) can be used for cleaning of hands, feet of farm workers and visiting officials.
- (ii) 2% solution of NaOH should be used at the entrance on

- foot mats to clean the shoes. This solution can also be used to scrub and clean gumboots and other items.
- (iii) Sodium hypochlorite : 2% active chlorine solution (disinfection of equipment)
 - (iv) Quaternary ammonium salts: 4% solution (treatment of walls, floors, ceilings and equipment).
 - (v) Calcium Hydroxide: 3% solution (treatment of walls and floors).
 - (vi) Cresolic acid 2.2% solution: (treatment of floors).
 - (vii) Synthetic phenols 2% solution: (treatment of floors).
 - (viii) Vircon-S@ and Trilucid concentrate where available.
 - (ix) Formalin and potassium permanganate for fumigation.

III.8.3 Clean-up and dis-infection are more time consuming

Experience of conducting recent operations showed that clean-up and dis-infection operations are more challenging and time-consuming than culling especially in commercial poultry. Jetting and suction machines were deployed for cleaning the lower level of the two- tiered structures used for keeping birds. The lower storey is normally used for collection of fecal material but a slurry of water mixed with waste materials may develop over time. The disposal of such liquid litter is to be ensured. The slurry was discharged into pits dug in the same premises which are to be properly covered and it is to be ensured that birds/ other poultry have no access to it. Pits can be covered by using netting or layer of earth with lime to be replenished periodically etc.

III.8.4 Clean-up and dis-infection in Backyard poultry

When it comes to disinfecting backyard poultry, the work is more extensive. The following tasks are required to be undertaken:

- i) Burn all the temporary cages, litter, baskets, feed and egg trays of all the poultry in the infected zone.

- ii) Remove and burn all litter from permanent cages and clean the cages.
- iii) Burn garbage around poultry keeping area.
- iv) Spray all the houses in the villages within infected zone irrespective of the presence or absence of poultry with 2% sodium hypochlorite solution.
- v) Spray poultry rearing houses in surveillance zone with 2% sodium hypochlorite solution.
- vi) Spray all the damp areas, drains etc. with 4% formalin. Formalin should not be used in the inhabited dwellings due to its irritant effect. In such areas, sodium hypochlorite or Trilucid concentrate or Vircon-'S' may be substituted. Thereafter, lime may be sprinkled.
- vii) Sprinkle lime on the roads, streets etc in all the villages under the operation.
- viii) White wash the poultry rearing houses in the infected zone.

III.8.5 Poultry -owners to be responsible for clean-up and dis-infection

States may consider making clean-up and dis-infection the responsibility of poultry owners under direct supervision of veterinarians/ para-veterinarians etc as per prescribed procedure. This is suggested because poultry owners are responsible for maintaining poultry as per minimum standards of hygiene and they should undertake consequent activities of clean-up etc if farms have not been properly maintained. It is, of course, the responsibility of the State AH Department also to ensure that farms follow such standards. Further clean up & dis-infection require specialized labor and farm owners may be better placed to organize such manpower.

III.9 Sealing of the premises and issue of sanitization certificate

After the culling and disinfection process has been completed, the premises are to be sealed by Government agency. A Sanitization Certificate is to be issued by the State Animal Health authorities stating that culling has been carried out and the area has been cleaned & dis-infected as per Action Plan and operations have been concluded. Thereafter, Post-operation surveillance is to be initiated.

III.10 Post operation Surveillance and freedom from disease

III.10.1 Post operation protocol includes actions to be taken after completion of control operations

This is the most difficult part of a control programme, as it will have a direct impact on the poultry industry. Once the disease has been encountered in a geographical region, it will bring along with it associated trade restrictions. In order to resume normal trade practices, it is essential that freedom from the disease be achieved at the earliest. Therefore, a series of strategic actions have to be taken up after control operations comprising of culling of birds followed by clean up and dis-infection are concluded. The actions to be taken after containment operations have been completed are contained in the Post-Operation Protocol (POP) and are explained in succeeding paras. It includes post operation surveillance, fumigation and spraying, maintaining vigil, and generating social awareness. The POP will be operational for a period of 3 months from date of issue of sanitization certificate.

III.10.1.1 Implementation and operationalisation of the Post Operation Surveillance Plan:

The Post Operation Surveillance Plan (POSP), drawn up jointly by the Government of India and the State Government, will be put into place after control and containment operations are completed and the area has been completely sanitized and a Sanitization Certificate has been issued by State authorities. The POSP is required to be operationalized in accordance with the OIE (World Organization of Animal Health) guidelines. It will comprise of action in two zones:

- The first zone is the infected/ operational area over which culling was carried out. Surveillance in this zone will be physical in nature directed towards verifying that no birds have been inducted into the area or are allowed into the area for the specified time period.

It will be necessary to undertake intensive physical surveillance within the infected / operational area. Teams will be required to be set up for such surveillance with defined area of supervision. The periodicity of inspection by such teams can be prescribed to ensure constant vigil. The teams should report back at specified intervals certifying that no poultry was found in the area or if poultry was found it has been culled. No compensation will be paid for such culling.

- The second zone is the area beyond the infected/ operational area i.e. the Surveillance Zone. Surveillance in this zone will involve collecting samples from poultry both commercial and backyard as per sample frame within the prescribed sampling time, which will be indicated by Government of India.

III.10.1.2 Fumigation/ spraying of infected farm/ premises

The area over which the birds were culled will have to be fumigated/ sprayed every 15 days after completion of control operations during POP. Fumigation will be done in closed places and spraying will be done in open/inhabited spaces.

III.10.1.3 Maintain Vigil

It will be necessary to maintain constant watch over areas where dead birds, litter and other materials have been disposed off and buried. This is necessary for two reasons. Firstly, to decide if further sprinkling/cover of earth/lime etc. is required for purpose of disinfection and secondly, to take further corrective action to cover these areas with earth or soil if they show signs of sinking/depression as birds decompose etc.

III.10.1.4 Communication and Social Awareness

It is to be ensured that no poultry is introduced into the area for the next 3 months after issue of Sanitization Certificate. This information should be disseminated in all villages/farms explaining the logic for it, as it is necessary to move towards a disease-free status. The local bodies, especially the Village Panchayats will have to be involved actively in physical surveillance. It will also be necessary to carry out sustained awareness programmes for the local people to educate them about the necessity of refraining from re-stocking poultry for at least 3 months. Experience indicates that there is a tendency on part of local people to bring in birds into the area clandestinely. This is to be discouraged and prohibited under any circumstances.

III.10.2 Freedom from disease

Disease free status can be declared by the country under intimation to OIE in case no other outbreak takes place or no samples collected during Post Operation Surveillance test positive for the next 3 months after culling of birds and disinfection / clean-up of all affected establishments.

In the event of vaccination policy adopted to prevent spread of the disease, the extent of spread of infection needs to be ascertained by

differential surveillance between infection and vaccination antibodies. Para III 13.3 refers to the Surveillance required to be carried out if vaccination is introduced

III. 11 Restocking of poultry in farms

On the basis of the results of the Post Operation Surveillance, the farms will be allowed to restock poultry. In recent operations, restocking was allowed by keeping sentinel birds in each of the shed of the farms, for 21 days @ minimum 50 birds per shed up to the capacity of 8000 layers or 10,000 brooders or growers and a minimum of 100 birds per shed for more than 8000 layers or 10,000 brooders or growers. The birds are required to be tested as per following protocol:

1. On 0 Day Serum sample from 5 birds per shed are to be collected to know the initial antibody status of birds.
2. On the 12th day cloacal / pharyngeal /nasal swabs are to be collected for virus isolation. One pooled sample of 5 birds from each shed is to be collected and sent to Bhopal for testing viral antigen/ virus isolation.
3. On 21st day again serum samples from the same birds are to be collected to assess the antibody status of such birds.
4. Any mortality is to be investigated and reported to Govt. of India immediately.
5. It is emphasised that if the farmer does not cooperate and does not follow the restocking protocol he/she will not be allowed to restock the birds.
6. During the restocking operation the local veterinarian is required to visit each farm at least once in a week.

7. The farms are to be cleaned and disinfected and the farmers allowed to restock the poultry as per their capacity if results as per above protocol test negative.

8. Repopulated flock in the infected area needs to be screened periodically. Random clinical, virological and serological investigations on the repopulated flock for a two months' period is recommended. Such sampling should be done at least once every fortnight to the extent of about 0.5% of the population introduced.

III.12 Compensation to be paid for forced culling

It is obvious that the programme of culling of all affected birds will succeed only if a system of adequately compensating the poultry farmers is put in place and activated immediately after the outbreak of NAI is confirmed. It is unrealistic to expect the poultry farmers to cooperate with the culling programme unless they can hope to get fair compensation immediately. It must be realised that any expenditure incurred on this will be more than justified by way of bringing about effective control on the disease. It is, therefore, the clear policy of the Government that poultry owners should be compensated for loss of birds etc. In order to ensure that compensation is paid expeditiously and that chances of its misuse are minimized, it will be advisable to make the District Collectors responsible for the same. In order to have effective control on the expenditure incurred on payment of compensation, it will be necessary to collect data on the poultry population before receipt of test results, as mentioned in para II.7.3. The Government of India will share cost of compensation paid for culling of birds during operations and destruction of infected feed/ feed materials up to 50% of total cost. The share of expenditure of Government of India can be charged to "Assistance to States for Control of Animal Disease (ASCAD)" Scheme by State Governments. It is suggested that State Governments should consider & determine following issues as part of operational preparedness :

- i) Funds should be available at local level to pay compensation.
- ii) Compensation should be paid immediately after birds are killed in operations as was done in Maharashtra, Madhya Pradesh and Gujarat in recent operations. In case of backyard poultry, payment of compensation may be considered at the time when the birds are collected from owners.
- iii) System of verifying claims and paying compensation should be decided in advance and notified to field agencies.

III.13 Vaccination

III.13.1 Vaccination Protocol

Vaccinated birds may get protected against the disease but continue to spread the infection. OIE recommends that in case of an outbreak of NAI in a densely populated poultry area, vaccination can be one of the options to be adopted as a control policy. Since there are various subtypes of influenza viruses, it is difficult to predict involvement of a particular sub-type and keep stocks ready. However, mass-vaccination with the most commonly used strain in an inactivated vaccine in the entire surveillance zone as ring vaccination could be adopted.

III.13.1.a Access by State Governments of reserve of vaccines maintained by Government of India

A Central Strategic Reserve of H5 and H7 vaccines has now been developed and is being maintained by the Government of India. If it is desired that ring vaccination be carried out in the intensive surveillance zone (i.e. 3 to 10 kms radius of infected site or in the surveillance zone as may be determined), the concerned State may

contact the Department of Animal Husbandry, Dairying and Fisheries (DADF), Government of India stating reasons for vaccination, no. of domestic avian species at risk, no. of doses required etc. If convinced, DADF may arrange to procure and dispatch appropriate vaccine to the concerned district authorities.

III.13.1.b Vaccination Protocol

The procedure and process for accessing and using the vaccines from the Central Strategic Reserve of Government of India by the State Governments has been laid down in the 'Protocol For Access and Use of Vaccines for Avian Influenza' which is available at the Departmental web site (<http://dahd.nic.in>) and has also been circulated to the State Governments. The Protocol has the following four parts:

- I. Technical specifications of vaccines available in the Central Strategic Reserve of GOI.
- II. Procedure to access vaccines
- III. Requirements to be met by the State Governments for receiving and utilizing vaccines
- IV. Related issues

III.13.1.c Familiarization of veterinarians and RRT's with Vaccination Protocol

The technical specifications and other requirements concerning use of these vaccines are covered in this Protocol for further dissemination to the Veterinarians especially the Rapid Response Teams (RRTs) of vaccinators so that in case of out-break valuable time is not lost in familiarizing the members of the RRTs with such details in time of emergency. It is to be ensured that the concerned Veterinarians and especially the Rapid Response Teams of vaccinators are familiarized with the technical specifications of the vaccines.

III.13.1.d Field level arrangements for vaccination to be ensured

Prior to receiving the vaccine, the district authorities should make all necessary arrangements for carrying out emergency vaccination including mobilization of teams etc. Equipment for vaccination viz. Syringes, vaccinators etc should be available in sufficient quantities. Government of India is also maintaining a Central reserve of vaccinators for use in case of outbreak. Cold chain facility to store vaccines is to be located as close to infected areas as possible. FMD-CP facilities under Animal Husbandry Department or facilities with Health Department should be identified immediately. The facility should have power back up. Place of storage in area of use has to be identified. If cold chain facility is not available then refrigerators can be used. (A 320 litres capacity refrigerator can accommodate 400 bottles of 500 ml. containing 1000 doses per bottle).

Method of transporting vaccines to storage facility and from the storage facility to area of use (if storage facility is not close to affected area) has to be determined to ensure maintenance of cold chain. In Maharashtra a refrigerated van was used to move vaccines from airport to storage facility at Aurangabad and then to Navapur in recent outbreak.

Arrangements are to be made to carry the vaccines further from storage facility to farms. This can be done by vaccine carriers/ thermocol boxes. Adequate quantities of carriers and ice gel packs/ ice will be required for movement of vaccine by carriers/ thermocol boxes.

III.13.2 Vaccination not to be undertaken as routine prophylaxis.

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- Thereafter, clinical surveillance will be maintained in the Surveillance Zone. The samples shall be collected and sent for testing over a 6 months period. If the area remains free from any further outbreak for a period of 6 months, it will be declared free from the disease.

III.13.4 Vaccination related issues

- **Exit Strategy:** The vaccines are to be used with a clearly defined objective linked to a time-phased exit strategy. Vaccination is not an end in itself and cannot be used indefinitely. Therefore, an exit strategy has to be identified. This will be done by the GOI in consultation with the State Government if vaccination is introduced in a particular area.
- **DIVA and Sentinel Birds:** A strategy that is capable of differentiating infected from vaccinated birds has been recommended. At the flock level, a simple method is to regularly monitor sentinel birds left unvaccinated in each vaccinated flock (e.g. 3 per hundred of vaccinated birds) though this approach has some management problems, particularly in identifying the sentinels in large flocks. For this purpose, it is suggested to use wing/ leg bands in sentinel birds for identification. These sentinel birds should not be allowed to move at of the surveillance zone, so that sampling can be done from other birds at a later date.
- **Data maintenance requirements in case of outbreak of Avian Influenza control vaccination** are large and enormous. Data is to be gathered for no. of birds vaccinated. it is necessary to maintain data of vaccination, to differentiate between vaccinated and non-vaccinated birds (e.g. sentinel birds), administration of second vaccination, post-vaccination surveillance to measure the efficacy of the dose etc. It would be appropriate to maintain data village-wise/ farm-wise. Data maintenance should proceed simultaneously with vaccination. Therefore, each vaccination team should have a person charged with data collection and maintenance.

IV Bio Security Measures, Advice to persons handling NAI infected poultry etc.

IV.1 Exchange of information with industry/farmers

Following notification of the disease, the Government at the level of the Secretary and Director, Animal Husbandry should take the poultry industry and small poultry farm owners into confidence and inform them periodically about the measures that are being taken to control NAI. Popular poultry and livestock journals and mass media should be encouraged to disseminate information about the Government's initiative on NAI. The support of the industry should be sought for implementing the Government's decisions.

IV.2 Media briefing by official spokesperson

In order to avoid spreading panic both in terms of public health and distress selling by poultry farmers, clear and precise briefing of the media should be made regularly by a designated official spokesperson of the state Government. The notification, instructions to be followed and information in terms of human consumption of poultry products should be announced through media. Unauthorized persons should be discouraged from voicing opinion in the media, which is best left to the experts identified by State Govt. for NAI

IV.3 Public awareness

Awareness in the general public about the disease and its consequences should be made through printed and mass media campaigns based on scientific facts and figures. It must be emphasized that proper cooking at more than 70° temperature for 30 minutes eliminates the virus and it is absolutely safe to consume properly cooked poultry meat and eggs. It is, of course, necessary to

encourage hygienic way of slaughtering, dressing and packing of chicken meat. It is important that details of negative results reported by the laboratory in respect of the surveillance samples are periodically furnished to the media. The journalists should also be invited to awareness campaigns to report the things in the right perspective. The poultry farmers associations, cooperatives, NECC, APEDA, etc. should be actively involved in this process. The minimum expenditure required for awareness campaigns can be met from the funds provided under the centrally sponsored scheme of "ASCAD" for the time being.

IV.4 Bio-Security Measures

The best way to control NAI is to prevent exposure by imposing strict biosecurity measures. This can be achieved by advising the poultry owners to adopt following measures in all farms, even though they are not currently infected.

i) Keep distance - The birds should be kept in enclosures. Only those who take care of the poultry of the farm should be allowed to go close to the birds. Unnecessary people should be restricted from entering the sheds. Inter-mingling of other birds/ animals with poultry should be avoided.

ii) Keep cleanliness - Cleanliness inside the sheds and around the farm is a must. It prevents germs and bacteria from multiplying. The bird cages should be cleaned and food and water for birds changed daily. The farms/ sheds should be dis-infected regularly. The entire farm premises including appliances, feeders, waterers, cages, etc., need to be thoroughly cleaned and disinfected at fortnightly intervals.

iii) Don't let the disease enter the farm - Clean own self and everything else that has been near other birds in the market or other

farms. The new birds should be kept away from healthy flock for at least 30 days. Dis-infect and wash shoes, clothes and hand before & after contact with poultry to prevent spread of disease.

iv) Don't borrow the disease - If equipment, tools or poultry supplies are borrowed from other farms, always clean and disinfect them before bringing them in contact with healthy birds and their habitats.

v) Know the signs - A check must be kept on birds. An increase in deaths should be noticed. Swelling around the eyes, neck, head, nasal discharge, discolouration of the wattles, combs, legs, drop in egg production are warning signs. An eye should be kept on sudden weakness, drooping wings and lack of movement among birds.

vi) Report sick birds - Every unusual sickness or death of birds should be immediately reported to the nearest veterinary centre.

vii) Follow uniform age group policy - In poultry farm, uniform age-group policy should be adopted. This is best done by adopting 'all-in-all-out' production system.

viii) Guidelines for farm personnel - Inter-sectional movements of farm personnel should be restricted. While leaving the farm premises, farm personnel should clean themselves thoroughly with disinfectants and change their clothing and shoes.

Other guidelines on bio-security measures are available at departmental web site (www.dahd.nic.in) under heading 'Bio Security Measures' and have also been circulated to the State Governments by letter dated 22nd February, 2006.

IV.5 Advice about contact with poultry in an area with NAI

People in areas with confirmed NAI should strictly follow the following instructions :

(i) People should avoid contact with chickens, ducks or other poultry as much as possible. Children should not have contact with poultry or any other affected birds.

(ii) Avoid handling (live or dead) chickens, ducks or any other poultry while visiting friends or family, even if the birds are thought to be healthy.

(iii) Avoid contact with poultry farms, duck farms or any farm where birds have been sick, killed or are thought to have bird flu.

(iv) If a person comes into contact with an environment that has had sick/dead chickens, ducks and other poultry, he/she must wash hands well and monitor temperature for 4 days. If he/she develops a high temperature, consult doctor to see whether treatment is needed.

(v) If a person has had contact with any dead birds that have died from avian flu or had contact with the droppings of these birds, consult a doctor to see whether treatment is needed.

IV.6 Raising poultry at home in an area affected with NAI

It is necessary that the poultry farmers, particularly those who are engaged in backyard poultry, in areas affected with NAI follow certain basic precautionary steps. These are described below:

(i) If someone has any chickens, ducks or any other poultry at home, it is important that he/she knows what to do if and when they are killed or die. He/she should know how to dispose them off and clean up the yard/pen, etc.

(ii) Whenever a person has contact with poultry, the chicken

shed/pen or anything with faeces on it, he/she must make sure he/she is protected by a mask, goggles, gown, rubber boots and gloves. If these items are not available, try to improvise as much as possible; for example use a cloth around the mouth and nose, plastic bags to cover the hands and shoes, overalls that can be washed etc. Wear this protective apparel to slaughter the poultry, dispose off the bodies, clean up the area (see below for advice on how to clean up the area). Make sure that children are not involved.

- (iii) After the area has been cleaned, remove all the protective apparel and wash hands, clothes and the body. A shower is the best option. If possible wash clothes in hot or warm soapy water, hang them in the sun to dry. Discard gloves, plastic bags and any other disposable materials. Clean all reusable items such as rubber boots and glasses/goggles. Always wash hands after handling these items.

IV.7 Advice on how to decontaminate the yard/chicken pen

The following advice should be followed in respect of decontamination of the yard/chicken pen.

- (i) After the culling of the poultry, the area must be cleaned.
- (ii) Take all protective measures outlined in the Action Plan before starting the cleaning process.
- (iii) Collect any faeces scattered around the yard into a pile to be buried. The faeces should be buried at a depth of at least 1 metre.
- (iv) Try to move droppings without raising too much dust

causing dried droppings to possibly blow into the person's face/eyes/mouth.

- (v) Remove as much of the droppings as possible from the chicken coup/shed and bury as above.
- (vi) Clean all areas very well with detergent and water.
- (vii) Discard all disposable items used to protect the person such as gloves, plastic bags, masks, etc. Place reusable items into a bowl with detergent and water for washing.
- (viii) Wash hands very well with soap and water.
- (ix) Shower/wash body using soap and water and wash hair.
- (x) Taking care not to contaminate the body. If not discarded wash clothes worn during the cull/clean up; use detergent and hot or warm water.
- (xi) Dry clothes in the sun.
- (xii) Any item that may be used again such as rubber gloves or boots should be washed very well in soap/detergent and water. To ensure the items are clean, wash twice.
- (xiii) Always wash hands after handling contaminated items.

IV. 8 Estimation of stores requirements

Based on the experience of handling the recent outbreaks an

estimation of stores requirements has been developed for the convenience of the States. Experience indicates that following norms are handy in planning for certain items required during operations:

- i) In order to cover the pits in scientific manner only 5 to 6 bags of slack lime (each weighing 25 kg) is required if the top opening of the pit is of a dimension of 2m x 2m x 2m.
- ii) On an average one gunny bag can carry 35-40 culled birds
- iii) One member of culling team can cull an average of 250 birds a day in organized poultry. In backyard poultry it may be as low as 18 to 100 or even 200 a day depending on the rate of arrival of birds etc.
- iv) Culling in one shift is possible in organized poultry but backyard poultry can be handled when farmers are there in their houses. In summer season two shift working is preferable for commercial poultry. Morning and evening shift of working is preferable in backyard poultry.
- v) Number of PPEs required is dependent on several factors such as the number of shifts, number of members of RRTs and in turn the number of culler-days and vaccinator-days and number of man-days required for support staff exposed to infected material such as JCB drivers, casual labourers etc. Proper understanding of job content of workforce helps in determining the basic requirement of PPEs.

Annexure I

List of species affected by Avian Influenza (H5N1)

Referenced reports of Highly Pathogenic Avian Influenza (H5N1) in wildlife and domestic animals

Sl. No	Scientific Name	Common Name	Wild	Captive/Sanctuary	Domestic Pet	Experiment	Mortality	Source Used
I. Order: Anseriformes								
1.	Aix sponsa	Wood duck	+	+	+	+	+	Ellis et.al. 2004
2.	Amazonetta brasiliensis	Brazilian teal	+	+	+	+	+	Ellis et.al. 2004
3.	Anas bahamensis	Bahama pintail	+	+	+	+	+	Ellis et.al. 2004
4.	Anas castanea	Chestnut-breasted teal	+	+	+	+	+	Ellis et.al. 2004
5.	Anas platalea	Argentine shoveller	+	+	+	+	+	Ellis et.al. 2004
6.	Anas platyrhynchos	Domestic duck	+	+	+	+	+	Guan et.al. 2002
7.	Anas sibilatrix	Chiloe wigeon	+	+	+	+	+	Ellis et.al. 2004
8.	Anas strepera	Gadwall	+	+	+	+	-	OIE Mission to Russia, 2005
9.	Anas versicolor	Puna teal	+	+	+	+	+	Ellis et.al. 2004
10.	Anser albifrons	Greater white-fronted goose	+	+	+	+	+	ProMED 20051130.3460 (NAI H5); Dan Hulea, per. Comm.
11.	Anser anser	Greylag goose	+	+	+	+	+	ProMed 20060510.1341 <u>INFLUENZA-WORLDWIDE (108): DENMARK, GERMANY</u>

12.	Anser anser domesticus	Domestic goose	+		+	+	Webster et al., 2002
13.	Anser indicus	Bar-headed goose	+			+	Chen et.al. 2005; Ellis et al. 2004
14.	Aythya ferina	Common pochard	+			-	OIE Mission to Russia, 2005
15.	Aythya fuligula	Tufted duck	+			+	OIE Dis Info v19 #17
16.	Aythya fuligula	Tufted duck	+			+	ProMED 20060219.0541
17.	Branta canadensis	Canada goose		+		+	Ellis et.al. 2004
18.	Branta ruficollis	Red-breasted goose	+			+	Bird flu battle hots up
19.	Callonetta leucophrys	Ringed teal		+		+	Ellis et.al. 2004
20.	Chenonetta jubata	Manned wood-duck		+		+	Ellis et.al. 2004
21.	Coscoroba coscoroba	Coscoroba swan		+		+	Ellis et.al. 2004
22.	Cygnus atratus	Black swan		+		+	Ellis et.al. 2004
23.	Cygnus cygnus	Whooper Swan	+			+	Promed 20050826.2527
24.	Cygnus melanocoryphus	Black-necked swan		+		+	Ellis et al. 2004
25.	Cygnus olor	Mute swan	+			+	FAOAIDE News Update on Avian Influenza #35
26.	Dendrocygna viduata	White-faced whistling-duck		+		+	Ellis et.al. 2004
27.	Mergus albellus	Smew/Common merganser	+			+	ProMED 20060222.0569
28.	Nesochen sandvicensis	Hawaiian goose		+		+	Ellis et.al. 2004
29.	Netta peposaca	Rosybill pochard duck		+		+	Ellis et.al. 2004
30.	Netta rufina	Red-crested pochard		+		+	Ellis et.al. 2004
31.	Tadorna ferruginea	Ruddy shelduck	+			+	OIE 2005. Disease Information Vol.18-no.21

II. Order: Charadriiformes						
1.	Larus atricilla	Laughing gull				+ - Perkins and Swayne, 2003
2.	Larus	Brown-headed gull	+	+		+ Chen et.al. 2005;and Liu et.al. 2005
3.	Larus ichthyæetus	Great black-headed gull	+	+		+ Chen et.al. 2005;and Liu et.al. 2005
4.	Larus ridibundus	Black-headed gull	+			+ Ellis et.al. 2004
5.	Tringa ochropus	Green sandpiper	+			- OIE Mission to Russia 2005
III. Order: Ciconiiformes						
1.	Anastomus oscitans	Asian open-billed stork	+			+ ProMED 20041214.3303, Keawcharoen et al., 2005.
2.	Ardea cinerea	Grey heron	+			+ Ellis et.al. 2004
3.	Ardea herodias (?)	Great blue heron	+			+ ProMED 20051130.3460, 20051201.3463 (NAI H5)
4.	Ardeola bacchus	Chinese pond heron	+			+ OIE 2005 Disease Information Vol. 18-no2
5.	Ciconia ciconia	White stork	+			+ ProMed 20060510.1341 <u>AVIAN INFLUENZA-WORLD-WIDE (108): DENMARK, GERMANY</u>
6.	Egretta garzetta	Little egret	+			+ Ellis et.al. 2004
IV. Order: Columbiformes						
1.	Columba livia	Feral pigeon	+			+ + Ellis et.al. 2004
2.	Macropygia ruficeps?	Little cuckoo dove	?			? <u>GenBank</u>
3.	Streptopelia tranquebarica	Red-collared dove	+			? ProMED 20041214.3303
V. Order: Falconiformes						
1.	Accipiter gentilis	Northern goshawk	+			+ OIE 2006. Disease Information vol19 no.8.
2.	Buteo buteo	Buzzard	+			+ OIE 2006. Disease Information vol19 no.8.
3.	Buteo lagopus	Rough-legged buzzard	+			+ ProMed 20060510.1341 <u>AVIAN INFLUENZA-WORLD-WIDE (108): DENMARK, GERMANY</u>

4.	Falco cherrug	Saker falcon		+		+	ProMed 20060130.0299
5.	Falco peregrinus	Peregrine falcon	+	+		+	OIE 2004 Disease Information Vol.17-no.5; Hong Kong Final Report 7/30/03
6.	Gyps sp?	"wild vulture"	+			+	OIE Disease Information vol 19 no 11. <u>AVIAN INFLUENZA IN NIGERIA Follow-up report No. 4</u>
7.	Ichthyophaga ichthyaetus	Grey-headed fish-eagle	+			+	FAO AIDE report #16
8.	Spilornis cheela?	Serpent eagle	+			+	FAO AIDE report #16
9.	Spizaetus nipalensis	Crested hawk-eagle	+			-	van Borm et.al., 2005

VI. Order: Galliformes

1.	Alectoris chukar	Chukar partridge				+	+	Perkins and Swayne, 2003
2.	Colinus virginianus	Bobwhite quail				+	+	Perkins and Swayne, 2003
3.	Corurnix coturnix japonicus	Japanese quail				+	+	Perkins and Swayne, 2003
4.	Gallus domesticus	Domestic chicken			+	+	+	Subbarao et.al. 1998
5.	Lophura leucomelanos	Kalij pheasant	+				+	Keawcharoen et al., 2005.
6.	Meleagris gallopavo	Turkey				+	+	Perkins and Swayne, 2003
7.	Numida meleagris	Pearl guineafowl		+		+	+	<u>OIE, 4/4/2006</u> ; Perkins and Swayne, 2003
8.	Pavo cristatus albus	White Indian peafowl	+				+	Keawcharoen et al., 2005.
9.	Phasianus colchicus	Ring-necked pheasant				+	+	Perkins and Swayne, 2004

VII. Order: Gruiformes

1.	Amauronis akool?	Brown (red-legged) crane	+				+	Xinhua News 1/11/06
2.	Fulica atra	Coot	+				-	OIE Mission to Russia 2005

3.	Gallinula chloropus	Common moorhen	+				+	ProMED 20051130.3460 (NAI H5)
4.	Porphyrio porphyrio	Sultan (Purple swamphen)	+				+	OIE 2006. Disease Information vol19 no.8.
VIII. Class: Mammalia								
1.	Chrotogale owstoni	Owston Palm Civet		+			+	OIE Aug 27, 2005 Mongolia Follow-Up Report No. 3
2.	Felis domestica	Domestic cat/ feral cat	+			+	+	Kuiken et.al. 2004
3.	Macaca fascicularis	Cynomolgus macques		+		+	-	Kuiken et.al. 2003
4.	Martes foina	Stone (beech) marten	+				+	<u>Avian influenza ? H5N1 infection found in a stone marten in Germany</u>
5.	Mustela putoris furo	Ferret				+	+	Govorkova et.al. 2004
6.	Oryctolagus cuniculus	New Zealand white rabbit				+	-	Perkins and Swayne, 2003
7.	Panthera pardus	Leopard		+			+	Thanawongnuwech et.al. 2005; and Keawcharoen et.al. 2004
8.	Panthera tigris	Tiger		+			+	Thanawongnuwech et.al. 2005; and Keawcharoen et.al. 2004
9.	Rattus norvegicus	Rat				+	-	Perkins and Swayne, 2003
10.	Sus domesticus	Pig			+	+	-	Choi et.al. 2005
IX. Order: Passeriformes								
1.	Acridotheres cristatellus	Crested mynah	+				+	2 more birds <u>H5N1-positive</u>
2.	Carpodacus mexicanus	House finch				+	+	Perkins and Swayne, 2003
3.	Copsychus saularis	Oriental magpie robin	+				+	<u>Oriental Magpie Robin tests H5N1 positive.</u>
4.	Corvus macrorhyn-olia	Jungle or Large billed crow	+				+	Mase et.al., 2005, Report of the Highly Pathogenic Avian Influenza Infection Route Elucidation Team, June 30, 2004.

5.	Corvus splendens	House crow	+				+	Keawcharoen et al., 2005.
6.	Dicrurus macrocercus	Black drongo	+				?	ProMED 20041214.3303
7.	Gracula religiosa	Hill mynah		+			+	ProMED 20051021.3075; 20051022.3085.
8.	Leiothrix lutea	Red-billed leiothrix		+			+	ProMED 20051021.3075; 20051022.3085.
9.	Lonchura punctulata	Scaly-breasted munia	+				?	ProMED 20041213.3303
10.	Lonchura sp.	Munia	+				+	OIE 3/20/06
11.	Lonchura striata	White-rumped munia	+				+	OIE 3/20/06
12.	Oriolus chinensis chinensis	Black-naped oriole		+			+	ProMED 20051021.3075; 20051022.3085.
13.	Passer domesticus	House sparrow		+		+	-	Perkins and Swayne, 2003
14.	Passer montanus	Eurasian tree-sparrow	+				+	Ellis et.al. 2004
15.	Pica pica sericea	Korean magpie	+				+	Kwon et al. 2005
16.	Sturnus vulgaris	European starling					+ -	Perkins and Swayne, 2003
17.	Taeniopygia guttata	Zebra finch					+ +	Perkins and Swayne, 2003
18.	Zosterops japonicus	Japanese white-eye	+				+	Japanese White-eye tested for avian flu
X. Order: Pelecaniformes								
1.	Phalacrocorax carbo	Great cormorant	+				+	OIE 2005, Disease Information Vol.18-no.21
2.	Phalacrocorax niger	Little cormorant	+				?	ProMED 20041214.3303
XI. Order: Phoenicopteriformes								
1.	Phoenicopterus ruber	Greater flamingo		+			+	Ellis et.al., 2004

XIII. Order: Strigiformes						
1.	Bubo nipalensis	Spot-bellied eagle-owl		+		+ FAO AIDE report #16
2.	Ketupa ketupu	Buffy fish-owl		+		+ FAO AIDE report #16
3.	Ketupa zeylonensis	Brown fish-owl		+		+ FAO AIDE report #16
4.	Strix uralensis	Spotted wood-owl		+		+ FAO AIDE report #16
XIII. Order: Struthioniformes						
1.	Dromaius novaehollandiae	Emu				+ - Perkins and Swayne, 2003
XIV. Order: Psittaciformes						
1.	Melopsittacus undulatus	Budgerigar				+ + Perkins and Swayne, 2003
XV. Order: Podicipediformes						
1.	Podiceps cristatus	Great crested grebe	+			- Lvov et al. In press. NCBI Sequence Viewer
2.	Tachybaptus ruficollis	Little grebe	+			+ OIE Dis Info v19 #17

Annexure II

Proforma for referring clinical material to laboratory for diagnosis of Bird-Flu.

1.	Name of the sender (e.g. Department, Ministry, Agency, Individual etc.)	
2.	Address (of the corresponding Office) with Telephone /Fax No. E-mail	
3.	Location from where material was collected: Farm/ Backyard: Village: Taluka: District: State:	
4.	Species from which material was collected: Poultry, migratory birds, wild birds, pet birds, scavenger birds, other species	
5.	Susceptible population of poultry (in farm/ village/ area)	
6.	Nature of material (Tissue, swabs, blood serum, faecal dropping, etc.) & number	
7.	Transport medium used (on ice/ PBS / tissue culture medium) :	

8.	Manner of dispatch* Special messenger/ Courier	
9.	When disease was first notice/ reported along with symptoms (date, month)	
10.	Morbidity : e.g. number & percentage of sick birds	
11.	Mortality : e.g. number & percentage of birds died:	
12.	Vaccination history in last one month whenever applicable; (Name of vaccine and date of vaccination to be given)	
13.	Preliminary diagnosis if any & basis for the same	

* Clinical material from suspected avian influenza cases should be sent through special messenger only

Action Plan of the Department of Animal Husbandry, Dairying and Fisheries in respect of Bird-Flu may also be referred before dispatch of material.

Annexure III

Checklist for Preparedness, Control and Containment of Avian Influenza

Sl. No	Point of action	Details of action to be taken/ confirmed/addressed at the level of the State Government
1.	Familiarization with Action Plan	Action Plan has been circulated to all concerned and they have been familiarized with the contents. The Action Plan has also been put on the Departmental website (http://dahd.nic.in).
2.	Familiarization with Vaccination Plan and other guidelines	Government of India guidelines, Action Plan, Protocol for Access and Use of vaccines must be perused and studied for control and containment. These are available on website at http://dahd.nic.in
3.	Familiarize District Collectors and other Departments in control and containment	(i) The District Collectors have been briefed to assume co-ordination of activities related to containment and control in case of outbreak. They have been familiarized with the strategic actions to be taken under the Action Plan. The coordinating role of the District Collector is most crucial in quarantine, movement control, closure of markets, ban on sale of related products, culling operations, payment of compensation,

		<p>administering and developing a vaccination plan, clean-up etc.</p> <p>(ii) All personnel of the Animal Husbandry Department are familiarized with aspects of control and containment.</p> <p>(iii) Concerned departments have been alerted to the role to be played by each in the Control Program. Co-ordination exists with related Departments especially Health.</p>
4.	Rapid Response Teams (RRTs)	<p>Rapid Response Teams of both cullers and vaccinators have been formed and also trained and briefed in detail on how to carry out the containment plan. Guidelines for setting up Rapid Response Teams have been conveyed by letters dated 6th December 2005 and 19th December 2005. The letters are on the departmental website. The following is to be ensured:</p> <ul style="list-style-type: none"> • Separate teams of cullers and vaccinators are to be formed. Each can perform either task of culling or vaccinating. • Each State/UT may determine the number of RRT's required by it as per size /concentration /type of poultry etc. • Action of culling in the three-kilometer radius of the affected area is to be undertaken immediately and expeditiously. If vaccination is decided to be undertaken it is to commence

		<p>simultaneously or soon after.</p> <ul style="list-style-type: none"> ● The RRT's should be trained to respond in an emergency. ● Time required to mobilize RRT's. Mobilization has to be immediate after notification of Avian Influenza. ● Deployment of RRT's i.e. how RRT's will begin and conduct operations has to be developed. The first phase will concentrate on culling of poultry etc. and disposal.
5.	Personal Protective Equipment (PPE's)	<p>Sufficient stock of Personal Protective Equipment (PPE) is readily and immediately available both for direct handlers and other than direct handlers. Reference may be made to Para III.3.4 of the Action Plan and to letters dated 25th November 2005 and 30th November 2005 of GOI. Following points are to be checked for preparedness:</p> <ul style="list-style-type: none"> ● Staff dealing with NAI must be equipped with PPE without fail. ● Two types of kits of PPE have been suggested by GOI viz for direct handlers and other than direct handlers and the composition of each has been detailed in the letters referred to above. <p>Samples of these kits were also sent to the States in November 2005 to</p>

facilitate purchase of PPE. Further, the WHO interim guidelines for protection of persons involved in mass slaughter of birds have been conveyed to State Governments by letter dated 25th November, 2005 and are available as a direct link from the Departmental website.

Large quantities of PPE's have been used up in operations in Maharashtra and Gujarat. Sufficient stock and continuing supplies are necessary. The hepa-mask is necessary for direct handlers i.e. cullers. The PPE is very important in conduct of operations as it provides safety to the cullers and the vaccinators. Workers/labor force will also have to be engaged at some stages of the operation especially for clean-up and culling. They will also be provided with kits. No instance of infection in persons involved in control operations has come to light in the affected countries. It has to be ensured that persons are engaged in control and containment only after being provided these kits. Points to observe are as under:

- Availability of sufficient stock
- Tie-up for regular supplies during operations
- Kit has to be changed every time a worker moves from one

		<p>infected premises to another</p> <ul style="list-style-type: none"> • Briefing must be given on importance of kit, its use, its disposal, and the need to change the kit on exiting an infected farm premises. • Kit has to be disposed off by burning on exiting a farm premises.
6.	Antiviral drug (oseltamivir)	Each worker/person involved in operations is to be administered antiviral drug (oseltamivir) by the Health authorities. Liaison with Health Secretary is necessary.
7.	Availability of other stocks	<p>Sufficient stock of following is available:</p> <ol style="list-style-type: none"> 1. Kit for testing by CVO/DIO as per Action Plan read with letter dated 30th November 2005 of GOI providing for one kit only instead of the two proposed earlier in the Action Plan. The letter is on the website. 2. Equipment and drugs for depopulation of poultry as per the Action Plan. 3. Dis-infectants, which are active against Avian Influenza as per the Action Plan. 4. Foggers/spray machines for dis-infecting the premises/area. 5. Equipment for administering vaccines viz. Vaccinators/syringes, PPE, vaccine carriers for cold chain

		<p>maintenance etc. Para 3 (i) Part III of the Vaccination protocol.</p> <p>6. Refrigerators/other equipment for maintenance of cold chain for vaccines Para 2 of Part III of the Vaccination protocol.</p>
8.	Vaccination	<p>Vaccination of poultry in the surveillance zone is an option which can be considered by the GOI in consultation with the State Govt. The following preparedness is required for vaccination:</p> <ul style="list-style-type: none"> • Vaccines will be provided by the Government of India based on an assessment of the poultry population in the surveillance zone. • Equipment for vaccination viz. Syringes, vaccinators etc should be available in sufficient quantities. Government of India is also maintaining a Central reserve of vaccinators for use in case of outbreak. • Cold chain facility to store vaccines as close to infected area as possible is to be located. FMD-CP facilities under Animal Husbandry Department or facilities with Health Department should be identified immediately. The facility should have power backup. • Method of transporting vaccines to storage facility and from the storage facility to area of use (if storage facility is not close to

		<p>affected area) has to be developed to ensure maintenance of cold chain. In Maharashtra a refrigerated van was used to move vaccines from airport to storage facility at Aurangabad and then to Navapur.</p> <ul style="list-style-type: none">● Place of storage in area of use has to be identified. If cold chain facility is not available then refrigerators can be used. (a 320 liters capacity refrigerator will accommodate 400 vials of 500 ml. Containing 1000 doses per vial). Please see Vaccination Protocol of GOI in this regard. It has been circulated to the State Governments. It is also on website: dahd.nic.in.● Arrangements are to be made to carry it further from storage facility to farms. This can be done by vaccine carriers/thermocool boxes. Adequate quantities of carriers and ice gel packs/ice will be required for movement of vaccine by carriers/thermocool boxes.● The procedure and process to access vaccines is laid down in the Vaccination Protocol Circulated to State Governments on 3rd February, 2006. It is also available on Department website. It has details on following aspects.
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		<p>(I) Technical specifications of vaccines available in the Central Strategic Reserve of GOI.</p> <p>(II) Procedure to access vaccines</p> <p>(III) Requirements to be met by the State Governments for receiving and utilizing vaccines</p> <p>(IV) Related issues</p>
9.	Compensation	<ul style="list-style-type: none"> • Payment of compensation should immediately follow culling of birds. • Funds should be available at local level to pay compensation. • System of verifying claims and paying compensation should be decided in advance and notified to field agencies. In Maharashtra and Gujarat compensation was paid immediately to poultry on completion of culling operations.
10	Information required in case of suspicion of outbreak	<p>The State Animal Husbandry Department should have the following information in a stage of suspicion of outbreak:</p> <p>(i) Preliminary identification of the production unit and subunits including topography of the farm and identification of the specific unit for which the suspicion has been reported;</p> <p>(ii) Number of birds and other</p>

		<p>animals on the farm;</p> <p>(iii) Identification of staff as well as vehicles directly involved with that unit;</p> <p>(iv) Recent movement of people, equipment, vehicles and animals/ birds;</p> <p>(v) Availability on site of disinfectants and equipment for disinfecting the premises;</p> <p>(vi) Anamnestic data (data relating to immune response).</p> <p>(vii) Information on any vaccination performed</p> <p>(viii) Record of animal or poultry movements up to 20 days prior to the onset of the first clinical signs;</p> <p>(ix) Record of movement of all people (staff, relatives, servicing personnel, veterinarians etc.) who had access to the farm;</p> <p>(x) Report of all vehicles, regardless of their contact with animals, which have had access to the farm.</p> <p>(xi) In addition sales of poultry, if any, over recent period may be determined and further information about sale viz. person to whom sold, place to which transported, use to which put, further sales, if any, etc</p>
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		<p>needs to be verified for containment and control.</p> <p>(xii) Record of mortality or sickness of birds at the suspected site and the alert zone is required. During this period, arrange to collect information about the total poultry population and population with individual poultry farmers keeping more than 100 birds in the alert zone (separately within a radius of 3 kms and between 3-10 kms from suspected site).</p>
11.	<p>Identification of infected zone (3 kms around infected farm premises) and surveillance zone (3 to 10 kms around infected farm premises)</p>	<p>Identify the following immediately before confirmation is available:</p> <ul style="list-style-type: none"> • number of villages in infected zone and surveillance zone • human population in infected zone and surveillance zone • number of households in infected zone and surveillance zone • poultry population in infected zone and surveillance zone • type of poultry in infected zone and surveillance zone viz. backyard and commercial with break up of each in each zone
12.	<p>General actions/ points in case of suspicion of outbreak.</p>	<p>(i) Identify logistics viz: latitude and longitude of closest place where helicopter can land if supplies are to be rushed</p>

		<p>(ii) Daily report must reach Department of Animal Husbandry, Dairying & Fisheries (DADF), Government of India</p> <p>(iii) 24 hour control room should be functional in the State. Number be given to Government of India.</p> <p>(iv) Person who will lead operations on the Animal Husbandry side should be clearly identified</p> <p>(v) Communication between teams and with control authority should be ensured. Allowing reimbursement of mobile bills up to a certain amount for the personnel engaged in operations can be considered.</p>
13	Restrictions to be enforced at the site and the alert zone pending receipt of test reports.	<p>Pending receipt of the test results, the entire suspected farm should be cordoned off and following restrictions should be immediately brought into effect in the alert zone :</p> <p>(i) No vehicles should be allowed to ply in and out of the affected farm premises. Personal vehicles should be left outside the farm premises.</p> <p>(ii) No movement of poultry, eggs, dead carcass, manure, used litter, farm machinery, equipment or any such material should be allowed both within the alert zone and from and to outside the zone.</p>

		<p>(iii) The farm personnel should wear protective clothing all the time inside the farm, including face-masks and gloves, gumboots (or shoes with disposable covers) etc. While leaving the farm premises, farm personnel should leave the protective clothing etc at the farm and clean themselves thoroughly with suitable disinfectants.</p> <p>(iv) Movement of people to and from the suspected farm should be restricted to the barest minimum. No other animals should be allowed in the farm.</p> <p>(v) Inter-sectional movements of farm personnel should be banned. They should not visit any other poultry farm, bird sanctuary, zoo etc.</p> <p>(vi) Disinfection procedures should be strictly applied at the entrance of the premises.</p> <p>(vii) All records of birds present at the farm are to be maintained properly.</p> <p>(viii) Before the test results are received, the possibility of closing the markets and shops in the area may be explored in consultation with the revenue authorities, particularly if more farms become suspect during this period. Necessary legislative framework should be checked in this regard.</p>
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		<p>The restrictions mentioned above should, of course, be abolished if the laboratory diagnosis proves to be negative for NAI.</p>
14	De-population of affected flock	<p>This will be the first phase of operations to commence. The depopulation and disposal of infected birds must be performed in the quickest time span possible to prevent spread of infection.</p> <p>(1) Destruction of following is to be ensured:</p> <p>a) The entire stock of diseased and in-contact birds in the presence of the designated Veterinary Officer and concerned local authorities like officials of the Revenue Department, Municipality, Panchayat etc. The means of destroying the stock should be humane.</p> <p>b) All the poultry products including meat, eggs and waste materials, like used litter and manure, must not be allowed to move out of the infected premises and should be destroyed at once including any material left over from the period before the disease was reported. Procedure for destruction of infected materials is given at Action Plan.</p> <p>c) It has to be ensured that the</p>

		<p>dead birds, eggs and other materials are not moved out of the infected site under any circumstances.</p> <p>d) The Government may designate any other appropriate authority for supervising the culling and disposal of dead birds from the point of view of determining the compensation to be paid to the affected poultry farmers.</p> <p>e) Action plan on manner of culling is required.</p> <p>Poultry can be culled by de-capitation. In Maharashtra and Gujarat the method of decapitation was largely followed. The birds were administered a drug (Pheno Barbitone in Gujarat) which acted like an anaesthetic and reduced activity levels in the birds thus making culling operations easier. If drugging is to be done sufficient quantities of drug will be required. On an average one culler is assumed to destroy about 300 birds in a day on a six-hour daily work schedule.</p>
15.	Disposal	<ul style="list-style-type: none"> ● No material such as dead birds, eggs, etc. should leave the infected site. ● Identify method of disposal. It can be by burning or burial. ● If disposal is by burial deep pits are to be dug. In Gujarat and

		<p>Maharashtra, JCB's were used to dig deep trenches. The State Public Works Department could be associated in this exercise.</p> <ul style="list-style-type: none"> • Dis-infection procedures have to be followed when a vehicle exits an infected premises. Sufficient quantities of dis-infectants are required. • If disposal is to be by burning, sufficient quantities of wood etc. should be available. • Plastic sheets, bags/sacks, calcium hydroxide etc. is required in sufficient quantities for disposal.
16.	Cleaning and disinfection of the premises and farm implements	<p>The procedure for cleaning and disinfection of the premises and farm implements and the list of disinfectants is given in the Action Plan.</p> <ul style="list-style-type: none"> • This is emerging to be a time-consuming phase in Maharashtra and Gujarat and involves heavy work. • JCB's will be required to dig trenches for disposal of other materials. Otherwise labor will have to be used. • Labor may also have to be engaged for clean-up. In that case labor has to be provided with PPE and antiviral drug (oseltamivir) with instructions to dispose it off

		<p>after use on an infected premises.</p> <ul style="list-style-type: none"> • Dis-infectants, equipment for spraying and fumigation etc. should be available. Maharashtra and Gujarat had to use jetting and suction machines to drain water. Dry litter from pits had to be cleaned manually thereafter.
17.	Media briefing by official spokesperson (Para IV.2 of the Action Plan)	In order to avoid spreading panic both in terms of public health and distress selling by poultry farmers, clear and precise briefing of the media should be made regularly by a designated official spokesperson of the state Government.

Annexure IV

Immediate points to be handled if outbreak is confirmed

Sl. No.	Activiy	Detailed Scheduling
1.	General	<ul style="list-style-type: none">• Identify logistics viz: latitude and longitude of closest place where helicopter can land if supplies are to be rushed• Government of India guidelines, Action Plan, Protocol for Access and Use of vaccines must be perused and studied for control and containment. These are available on website at dahd.nic.in• District Collector has to play a central, co-ordinating role especially concerning aspects of quarantine, closure of shops etc., compensation (payment and verification), maintaining supply lines for equipment etc.• Daily report must reach Department of Animal Husbandry, Dairying & Fisheries (DADF), Government of India• 24 hour control room should be functional in the State. Number be given to Government of India.• Person who will lead operations on the Animal Husbadry

		<p>side should be clearly identified</p> <ul style="list-style-type: none"> • Communication between teams and with control authority should be ensured. Allowing reimbursement of mobile bills up to a certain amount for the personnel engaged in operations can be considered.
2.	<p>Identification of infected zone (3 kms around infected farm premises) and surveillance zone (3 to 10 kms around infected farm premises)</p>	<p>Identify the following immediately before confirmation is available:</p> <ul style="list-style-type: none"> • number of villages in infected zone and surveillance zone • human population in infected zone and surveillance zone • number of households in infected zone and surveillance zone • poultry population in infected zone and surveillance zone • type of poultry in infected zone and surveillance zone viz. backyard and commercial with break up of each in each zone
3.	<p>Rapid Response Teams (RRT's)</p>	<ul style="list-style-type: none"> • Total number of RRT's required as per poultry population, its size, concentration and type. • RRT's of both cullers and vaccinators are required • Time required to mobilise RRT's. Mobilisation has to be immediate after notification of Avian Influenza

		<ul style="list-style-type: none"> • Deployment of RRT's i.e. how RRT's will begin and conduct operations. The first phase will concentrate on culling of poultry etc. and disposal.
4.	Personal Protective Equipment (PPE's)	<p>Large quantities of PPE's have been used up in operations in Maharashtra and Gujarat. Sufficient stock and continuing supplies are necessary. 2 kits have been recommended by Government of India viz for direct handlers and other than direct handlers. The hepa-mask is necessary for direct handlers i.e. cullers. The PPE is very important in conduct of operations as it provides safety to the cullers and the vaccinators. Workers/labor force will also have to be engaged at some stages of the operation especially for clean-up and culling. They will also be provided with kits. No instance of infection in persons involved in control operations has come to light in the affected countries. It has to be ensured that persons are engaged in control and containment only after being provided these kits. Points to observe are as under:</p> <ul style="list-style-type: none"> • Availability of sufficient stock • Tie-up for regular supplies during operations • Kit has to be changed every time a worker moves from one infected premises to another

		<ul style="list-style-type: none"> • Briefing must be given on importance of kit, its use, its disposal, and the need to change the kit on exiting an infected farm premises. • Kit has to be disposed off by burning on exiting a farm premises.
5.	Antiviral drug (oseltamivir)	Each worker/person involved in operations is to be administered antiviral drug (oseltamivir) by the Health authorities. Liaison with Health Secretary is necessary.
6.	Regulation of access to infected premises/restrictions on movement etc.	<ul style="list-style-type: none"> • Necessary legislative framework should be checked for this aspect. • An absolute ban on movement of poultry or its products from and to the infected area is to be imposed. The District Collector/concerned authority may be asked to keep the order ready and put a mechanism into place to enforce it. This aspect has to be co-ordinated & controlled strictly. • All poultry and egg markets/shops in a radius of 10 kms from the infected site are to be immediately got closed. • Movement of people to and from the farm premises to be restricted to requirements related to handling the disease with proper

		<p>cover and dis-infection procedures.</p> <ul style="list-style-type: none"> • Farm personnel in the infected area should not to be allowed to visit any other poultry farm.
7.	Clear plan on manner of culling	<p>This will be the first phase of operations to commence. Poultry can be culled by de-capitation. In Maharashtra and Gujarat the method of decapitation was largely followed. The birds were administered a drug (Pheno Barbitone in Gujarat) which acted like an anaesthetic and reduced activity levels in the birds thus making culling operations easier. If drugging is to be done sufficient quantities of drug will be required. On an average one culler is assumed to destroy about 300 birds in a day on a six-hour daily work schedule.</p>
8.	Disposal	<ul style="list-style-type: none"> • No material such as dead birds, eggs, etc. should leave the infected site. • Identify method of disposal. It can be by burning or burial. • If disposal is by burial deep pits are to be dug. In Gujarat and Maharashtra, JCB's were used to dig deep trenches. The State Public Works Department could be associated in this exercise. • Dis-infection procedures have to be followed when a vehicle exits

		<p>an infected premises. Sufficient quantities of dis-infectants are required.</p> <ul style="list-style-type: none"> ● If disposal is to be by burning, sufficient quantities of wood etc. should be available. ● Plastic sheets, bags/sacks, calcium hydroxide etc. is required in sufficient quantities for disposal.
9.	Vaccination	<p>Vaccination of poultry in the surveillance zone is an option which can be considered by the GOI in consultation with the State Govt. The following preparedness is required for vaccination:</p> <ul style="list-style-type: none"> ● Vaccines will be provided by the Government of India based on an assessment of the poultry population in the surveillance zone. ● Equipment for vaccination viz. Syringes, vaccinators etc should be available in sufficient quantities. Government of India is also maintaining a Central reserve of vaccinators for use in case of outbreak. ● Cold chain facility to store vaccines as close to infected area as possible is to be located. FMD-CP facilities under Animal Husbandry Department or facilities with Health Department should be identified immediately. The facility should

		<p>have power back up.</p> <ul style="list-style-type: none">• Method of transporting vaccines to storage facility and from the storage facility to area of use (if storage facility is not close to affected area) has to be developed to ensure maintenance of cold chain. In Maharashtra a refrigerated van was used to move vaccines from airport to storage facility at Aurangabad and then to Navapur.• Place of storage in area of use has to be identified. If cold chain facility is not available then refrigerators can be used. (a 320 liters capacity refrigerator will accommodate 400 vials of 500 ml. Containing 1000 doses per vial). Please see Vaccination Protocol of GOI in this regard. It has been circulated to the State Governments. It is also on website: dahd.nic.in.• Arrangements are to be made to carry it further from storage facility to farms. This can be done by vaccine carriers/thermocool boxes. Adequate quantities of carriers and ice gel packs/ice will be required for movement of vaccine by carriers/thermocool boxes.
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10.	Compensation	<ul style="list-style-type: none"> • Payment of compensation should immediately follow culling of birds. • Funds should be available at local level to pay compensation. • System of verifying claims and paying compensation should be decided in advance and notified to field agencies. In Maharashtra, M.P. and Gujarat compensation was paid immediately to poultry on completion of culling operations.
11.	Clean-up and Dis-infection	<ul style="list-style-type: none"> • This is emerged to be a time-consuming phase in Maharashtra and Gujarat and involved heavy work. • JCB's will be required to dig trenches for disposal of other materials. Otherwise labor will have to be used. • Labor may also have to be engaged for clean-up. In that case labor has to be provided with PPE and antiviral drug (oseltamivir) with instructions to dispose it off after use on an infected premises. • Dis-infectants, equipment for spraying and fumigation etc. should be available. Maharashtra and Gujarat had to use jetting and suction machines of drain water.

Annexure V

Instruments/equipment/other materials required in AI operations

- (1) PPE,
- (2) JCB By hiring
- (3) Vehicles Transportation of RRTs by hiring,
- (4) Jet cum suction machine by hiring
- (5) Fire gun,
- (6) Foggers,
- (7) LP Gas,
- (8) Vaccine gun,
- (9) Disposable needles/syringes
- (10) Sterilizer,
- (11) Cold cabinet,
- (12) Vaccine carriers,
- (13) Computer,
- (14) Mobile Incinerator.
- (15) Lime brisker/white wash,
- (16) Formalin, Sodium Hypochlorite, other disinfectants
- (17) Lime powder
- (18) Dettol/Dettol soap,
- (19) Napkins,
- (20) Caustic soda,
- (21) Drinking water for RRTs,
- (22) Hygienic food,
- (23) Transport facilities,
- (24) Battery /torch
- (25) Antiviral drug (oseltamivir),
- (26) Spirit.
- (27) Gunny bags,

- (28) Thread for packing gunny bags
- (29) Paint,
- (30) Brush,
- (31) Plates and sticks,
- (32) Raincoat and gumboot if necessary,
- (33) Stationary,
- (34) Telephone STD/Mobile phones/internet,
- (35) Fax/Xerox machine,
- (36) Camera

The above list is illustrative.

Annexure VI

KIT for the Veterinary Officer / Disease Investigation Officer

- 1) Paper and pens
- 2) Epidemiological inquiry form
- 3) Equipment necessary for the clinical visit and sampling procedures:
 - (a) PPE Kits as per composition/ specification approved by Government of India and detailed at Annexure VI.
 - (b) paper tissues
 - (c) 5 leak proof containers
 - (d) 5 leak proof and water resistant plastic bags
 - (e) torch
 - (f) active disinfectant solution
 - (g) 2 pens and a notepad
 - (h) 100 syringes 2.5 ml with needle
 - (i) 100 thin, small plastic bags
 - (j) 2 pairs of surgical scissors
 - (k) 2 pairs of forceps
 - (l) tape
 - (m) 2 felt tip pens
 - (n) 1 thermic container (ice box)
 - (o) 5 frozen icepacks
 - (p) sterile swabs
 - (q) 50 test tubes
 - (r) 10 black waste-bags
 - (s) 50 rubber bands
 - (t) cardboard container
- 4) At least 10 of these kits should be carried to all suspected or infected places in case of suspicion of outbreak.

Annexure VII

Composition of PPE Kits **Revised kits of PPE as reviewed by GOI after outbreak**

A. Kit for other than direct handlers

1.	'Dangri' with hood attached	01 no
2.	House gloves	01 pair
3.	Shoe covers	01 pair
4.	Face Mask	01 no
5.	Disposable protective glasses	01 no

B. Kit for direct handlers

The kit for direct handlers / cullers is same as specified at 'A' above except that the direct handlers shall use the Face Mask with hepa filter (N95).

Further specification of the PPE kit are as given below

1.	'Dangri'	Disposable, free size, full sleeves, made up of non woven fabric (spun bonded, poly propylene material not less than 90 GSM), cuff with elastics, zipper in front, hood attached covering sides of face and neck.
2.	House gloves	Disposable, ISI mark, size - 10 no.
3.	Shoe cover	Disposable, made up of polyester woven fabric with protective rubber coating preferably Tetoron, with thick padded foot base and can be used under field condition.
4.	Face Mask	Surgical facemask with nose piece.
5.	Disposable protective Glasses	Disposable, with clear glasses, zero power, eye fitting and elastic band holder

Note:- The kit must be disinfected by gamma irradiation and the irradiation certificate required.

Annexure VIII

AVIAN INFLUENZA EPIDEMIOLOGICAL INQUIRY FORM

Date :
Dr :
Phone number :
Name and Address of farm :
Phone :
District :
State :
Farm code or identification number :
Owner :
Address of the owner :
Phone :
Information provided by :
Farm Veterinarian Dr.
Present NO/YES

1. INFORMATION CONCERNING THE FARM

TYPE OF ESTABLISHMENT : Industrial/Rural/Dealer/Retailer
CATEGORY/PRODUCTION LINE : Table-egg layers/Meat birds
Type : Grandparents :
Parents :
Pullets :
Meat-type (broiler) :
Layers :

NUMBER OF BIRDS AND SPECIES PRESENT .

	No.	Date of placing	Sex	Age
Chickens Meat :				
Breeders :				
Layers :				
Other :				

HATCHERY OF ORIGIN

Company Hatchery : NO/YES

Company Address :

District : State :

Phone : Fax :

Debeaking operations - Date :

Performed by : Family members/Employed staff/External staff/Other

Remarks

HOUSING SYSTEM

Deep litter	:	YES	NO
Cage system	:	YES	NO
Type of ventilation system	:	Natural/Natural with fans /Artificial	
Bird proof nets	:	YES	NO
Possibility of contact with wild birds	:	YES	NO
Species	:		
Other birds present on site (captive or free)	:	YES	NO
Species	:		
Presence of ponds or lakes	:	YES	NO
Other water reservoirs	:	YES (specify)	NO
Presence of pigs	:	YES (specify)	NO
Other animals	:	YES (specify)	NO
Remarks	:		

2. INFORMATION CONCERNING MOVEMENTS OF BIRDS

a) Introduction of birds from other establishments/ hatcheries/farms (Twenty days before the onset of the first clinical signs) : NO / YES

Date : No. :
Species : Farm : Hatchery :

Name of Farm :
Address :

District :

b) Introduction of birds from exhibitions/markets/fairs : YES / NO
(Twenty days before the onset of the first clinical signs)

Date : No. : Species :

Origin : Fair/Market/Exhibition
District :

c) Exit of birds/eggs to other farms/establishments/ : YES / NO
hatcheries/abattoirs (In the time span between 20
days before the onset of the first clinical signs and
the date the farm was put under restriction)

Date : No :

Destination : Other farm/Hatchery/Abattoir/Other

Name of establishment :
Address :

District : State :

d) Exit of birds/eggs to other fairs/markets/exhibitions : YES / NO
(In the time span between 20 days before the onset of
the first clinical signs and the date the farm was put
under restriction)

Date : No. :

Destination : Fair /Market /Exhibition/ Other
Address :
District :

3. INFORMATION CONCERNING MOVEMENT OF PEOPLE:

(In the time span between 20 days before the onset of the first clinical signs and the date the farm was put under restriction) :

YES / NO

Date :

Veterinarian /Technician /Vaccinating crew / Debeaker /Farmer / Dealer/
Other (specify)

Address :

District :

State :

Phone number :

Previously visited farm :

Name :

District :

4. INFORMATION CONCERNING MOVEMENT OF VEHICLES

(A) Transport of animals, (B) Transport of feed, (C) Transport of eggs, (D) Collection of dead animals, (E) Fuel/Gas, (Other) Specify

(In the time span between 20 days before the onset of the first clinical signs and the date the farm was put under restriction)

Date of entry Vehicle : (A/B/C/D /E/other)

Name of company :

Fax/Phone number :

5a) INDIRECT CONTACTS WITH OTHER POULTRY ESTABLISHMENTS

YES / NO

(Sharing of equipment, vehicles, feed, staff, etc. in the time span between 20 days before the onset of the first clinical signs and the date the farm was put under restriction)

Date of contact :

Name of farm or establishment :
District :
shared vehicle/shared feed/shared equipment/shared staff/
collection/recycle of litter/ other (specify)

5b) CONTACTS WITH OTHER FARMS OWNED BY THE SAME OWNER

NO / YES

Name of farm or establishment :
Address :
District :

Species farmed : number : Empty/Full :

5c) CONTACTS WITH POULTRY FARMS LOCATED NEAR THE OUTBREAK

NO / YES

Name of farm or establishment :
Address :

District :
Distance in metres :
Species farmed :
Number :

Empty/Full

ANAMNESTIC DATA

WEEKLY MORTALITY

NB: data concerning mortality rates recorded in the 6 weeks prior to the onset of clinical signs

WEEK : FROM : TO :
NUMBER ANIMALS DEAD :
Remarks :

Date of onset of AI clinical signs :

Clinical signs observed by the farmer :

TOTAL NUMBER OF BIRDS

Farm put under restriction (dead or alive)

Number of ill birds (Farm put under restriction)

Number of dead birds (Farm put under restriction)

Number of birds depopulated

NB: this information must refer to the data collected when the farm has been put under restriction after confirmation of NAI

6. VACCINATION OF BIRDS AND ADMINISTRATION OF DRUGS

Vaccination of birds is practised : NO YES

Date of vaccination :

Type of vaccine :

Commercial name :

Administration route :

Live or inactivated :

Vaccinating staff :

Family Employees External staff Other

Remarks

Administration of drugs/medicaments

In the last 15 days : NO YES (specify):

Staff who administered the medication:

Family / Employees / External staff / Other

Remarks

7. CLINICAL INVESTIGATION PER SPECIES

Species :

Depression :

Respiratory signs : mild/severe

Drop or cessation of egg laying :
Oedema, cyanosis or cutaneous haemorrhages :
Diarrhoea :
Nervous signs :
Other :

8. GROSS FINDINGS

Rhinitis and sinusitis

Tracheitis catarrhal

haemorrhagic -

Aersacculitis

Haemorrhages epicardium -

endocardium

proventriculus -

ovarian follicles

Enteritis catarrhal

haemorrhagic -

Pancreatitis

Other:

Remarks

Signature

Date: