

Meeting Report

on

**Asia-Pacific Workshop on Multisectoral Collaboration for the
Prevention and Control of Zoonoses**

Kathmandu, Nepal, 27-29 November 2013

Executive Summary

Expansion of population, higher demand on agriculture and livestock production, extensive use of antimicrobial and global warming triggers the emergence and re-emergence of new pathogens, contributing the significant risk of public health threat. This year 2013 was significant with the emergence of avian influenza (H7N9) and Middle East respiratory syndrome coronavirus (MERS-CoV) and escalating the outbreaks of Highly Pathogenic Avian Influenza (H5N1) in a number of Asian countries..

In recent years, progress has been made to further enhance collaboration between human health, animal health and relevant sectors such as wildlife, environment to share the best practices and innovative ideas to address zoonotic and other emerging and re-emerging diseases at the human, animal and ecosystem interfaces. The Asia-Pacific Workshop on Multisectoral collaboration for the prevention and control of zoonoses was organized by WHO in collaboration with FAO and OIE in Kathmandu, Nepal from 27 to 29 November, 2013. It was the fourth Regional workshop organized by three organizations since 2010.

A total of 114 participants, representing the animal and human health, wildlife and environment sectors, academic institutions, donors and partners attended the workshop. The workshop reviewed the recommendation of the previous workshop as well as global updates on zoonoses. There were presentations on zoonotic influenza and novel coronaviruses as these emerging infectious diseases were major challenges of 2013. FAO, OIE and WHO highlighted regional tripartite activities on zoonotic influenza, rabies and antimicrobial resistance which have been considered as priority issues for operationalization of One Health. The People's Republic of China, Cambodia, Indonesia and Nepal shared country experience in combating avian influenza A(H5N1) and A(H7N9). There were poster presentation by 19 Asian countries which highlighted status of zoonotic diseases, progress made in prevention and control of zoonoses and the best practices to further enhance intersectoral coordination mechanism. The implementation of One Health approach was analyzed by extracting key issues from country poster presentations and information provided through questionnaire by participating countries. The gaps and challenges were discussed and the progress of application of One Health approach was overviewed.

As compared to previous regional tripartite workshops, more female participants (40%) were present in this workshop and all participants were satisfied with organizational and technical part of the workshop as it provided a good platform for sharing country experiences in prevention and control of endemic, emerging and re-emerging zoonoses. Participants were actively involved in group discussions on live bird market management (LBM), i.e. joint outbreak investigation and risk assessment, surveillance and monitoring, risk reduction and control measures at LBM. In addition, participants were given opportunities to attend of the three parallel sessions; socio-economic dimension of zoonoses, wildlife and communication.

The regional tripartite group acknowledged and thanked the Government of Nepal in hosting this mega event. The generous supports from donor agencies such as European Union, AusAID, USAID and JICA were also appreciated. The workshop recommended partners and countries: to strengthen and consolidate ongoing national efforts for cross-sectoral collaboration; to further enhance national and subnational mechanisms for information sharing, communication, joint risk assessment and response; to give greater consideration on One Health initiatives at national and local levels; to consider

socioeconomic impacts of zoonoses including cost-benefit analysis for prevention and control measures; to enhance surveillance of influenza A virus at live bird markets and to prioritize risk reduction interventions and joint implementation strategies; to develop and/or implement a comprehensive national strategy for rabies elimination based on mass dog vaccination and dog population management; to advocate and support multi-sectoral national action plans for the prevention of antimicrobial resistance development; to support countries to develop and operationalize common communication guidelines, standard tools for joint risk assessment, outbreak investigation and risk communication for zoonotic events; to promote active involvement of wildlife authorities and experts in One Health activities.

As continuation of regional tripartite activity, it is agreed that the next workshop will be organized by FAO in collaboration with OIE and WHO focusing upon evaluating the effectiveness/efficiencies of workshops, lessons learned and developing a future regional action plan.

Abbreviation

| | |
|-----------|--|
| AI | Avian influenza |
| AMR | Anti-microbial resistance |
| APSED | Asia-Pacific Strategy for Emerging Diseases |
| ASEAN | Association of South East Asian Nations |
| AusAID | Australian Aid for International Development |
| CCHF | Crimean-Congo Haemorrhagic Fever |
| CIP | Collaborative Investigation Project |
| CDC | US Centers for Diseases Control and Prevention |
| COMBI | Communication for behavioural impact |
| DG | Director General |
| DFID | UK Department for International Development |
| DOH | Department of Health |
| DVS | Department of Veterinary Services |
| EBS | Event-based surveillance |
| EIDs | Emerging Infectious Diseases |
| EOC | Emergency Operation Center |
| EU | European Union |
| EWARS | Early Warning and Alert Response System |
| FAO | Food and Agriculture Organization of the United Nations |
| FETP | Field Epidemiology Training Programme |
| FETPV | Field Epidemiology Training Programme for Veterinarian |
| FETPW | Field Epidemiology Training Programme for Wildlife |
| GALVmed | Global Alliance for Livestock Veterinary Medicine |
| GDP | Gross Domestic Product |
| GF-TADs | Global Framework for Progressive Control of Trans-boundary Animal Diseases |
| HPAI | Highly Pathogenic Avian Influenza |
| HPED | Highly Pathogenic and Emerging and re-emerging Diseases |
| IEC | information education and communication |
| IHR 2005 | International Health Regulation (2005) |
| ILI | influenza-like illness |
| LBM | Live bird market |
| MERS- Cov | Middle East respiratory syndrome coronavirus |
| MOA | Ministry of Agriculture |
| MOH | Ministry of Health |
| MoU | Memorandum of Understanding |
| NCDC | National Center for Disease Control |
| NTDs | Neglected Tropical Diseases |
| OH | One Health |
| OIE | World Organization for Animal Health |

| | |
|-------|--|
| PCR | Polymerase Chain Reaction |
| PDSR | Participatory Disease Surveillance and Response |
| PPE | Personal Protective Equipment |
| SAARC | South Asian Association for Regional Cooperation |
| SARI | Severe acute respiratory infection |
| SARS | Severe acute respiratory syndrome |
| SEARO | WHO South East Asia Region |
| SFTS | Severe fever with thrombocytopenia syndrome |
| SOP | Standard Operating Procedure |
| USAID | United States Agency for International Development |
| USDA | United States Department of Agriculture |
| WAHID | World Animal Health Information Database |
| WAHIS | World Animal Health Information System |
| WHO | World Health Organization |
| WPRO | WHO Western Pacific Region |
| WSPA | World Society for the Protection of Animals |

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Introduction

Approximately 60 per cent of all human infectious diseases and 70 per cent of those reported in the last 30 years are thought to have originated in animals. Close interaction between human, animal and wildlife, intensification of agricultural practices, excessive use of antimicrobial and adverse environmental changes contributed the emergence and re-emergence of new pathogens. Emerging and re-emerging zoonotic infections pose significant threats to health security, livelihood, food security and international trade of livestock and livestock products.

To effectively address zoonoses and emerging infectious diseases at the human, animal and ecosystem interfaces, a 'One Health' approach is being increasingly adopted emphasizing multi-sectoral and multi-disciplinary approach at various levels (international, regional, national and community levels). The WHO Regional Offices for South East Asia and the Western Pacific came up with common bioregional strategy called Asia Pacific Strategy for Emerging Diseases (APSED), which is designed to support Member countries to develop core capacities required for implementation of the International Health Regulations (IHR 2005). Zoonoses control is one of the priority areas of APSED and establishment of a functional coordination mechanism for prevention and control of zoonoses is a pillar of this strategy. WHO in collaboration with FAO and OIE have developed a guideline for establishing coordination mechanisms for prevention and control of zoonoses at the country level.

As part of the arrangements, tripartite regional workshops have been organized annually to review the progress in zoonoses prevention and the way forward to further strengthen multisectoral collaboration at the human, animal and ecosystem interfaces by Member countries and partner organizations. One of the first initiatives to discuss collaboration and coordination between human and animal health sectors was a Regional Workshop on Collaboration between Human and Animal Health Sectors for Zoonoses Prevention and Control held in Sapporo (2010). This work was further taken and expanded to multisectoral collaboration through a second meeting in Chiang Mai (January 2012) and a third in Bali (November 2012). The Bali workshop recognized the need to consider recommendations of the High-level Technical Meeting held in Mexico in November 2011 to Address Health Risks at the Human-Animal-Ecosystems Interfaces and recommends;

- FAO, OIE and WHO, regional organizations (ASEAN and SAARC) and other international partners will continue to collaborate closely to provide support to Member countries in strengthening functioning of national coordination mechanisms between animal, human, environmental and other relevant sectors to address zoonotic and other emerging and re-emerging diseases.
- Animal and human health sectors of Member countries will continue to collaborate in zoonoses prevention and control including documentation of good practices, taking into consideration supporting key operational elements of One Health;
- Member countries and partners explore mechanism to assess determine impact the benefit of using an One Health approach on the control of zoonoses, and emerging and re-emerging infectious diseases, and;

In order to ensure a multi-disciplinary approach for the prevention and control of zoonoses and to progress current collaboration with representatives of human health, animal health and relevant sectors such as wildlife, environment, the Asia-Pacific Workshop on Multisectoral Collaboration for the Prevention and Control of Zoonoses was organized by WHO in collaboration with FAO and OIE in Kathmandu, Nepal from 27 and 29 November, 2013. The objectives of the is workshop were to;

- provide an update on zoonotic diseases at global, regional and country levels.
- review the progress and experiences, identify the opportunities, barriers and gaps in coordination mechanisms between various relevant sectors at the international, regional and national levels for operationalization of 'One health'.
- share the lesson learnt from recent outbreaks of avian influenza (H7N9) event in China and novel coronavirus in the Middle East countries.
- prepare plans to develop standard approaches and tools for detecting, investigating and responding future threats due to emerging zoonotic diseases.
- make recommendations on the way to improve collaboration and coordination between human, animal and environmental sector for zoonoses prevention and control, focusing on unexpected emerging events.

The three-day workshop included seven sessions applying various modalities such as presentations, panel discussions, poster presentation, questionnaire survey, group discussion, parallel sessions on thematic issues such as socio economic dimension, wildlife and communication.

Session 1: Inauguration

The workshop was inaugurated by lighting the lamp and delivering the opening addresses by secretaries of ministries of health and population, and agricultural development, Nepal and the representatives from WHO, FAO and OIE.

Dr Lin Aung, WHO Representative to Nepal (On Behalf of the Regional Director, WHO SEARO) welcomed all the participant and acknowledged the government of Nepal for hosting the workshop. He emphasized that there is a periodic emergence of highly pathogenic infectious diseases at the human-animal interface and it demands coordinated, multidisciplinary and community-based action to address the threat of emerging infectious diseases (EIDs). He highlighted the emergence of avian influenza A(H7N9) in the People's Republic of China and the novel coronavirus in the Middle East clearly reiterates the need of active surveillance and response at regional and country-levels as per the requirements of the International Health Regulations (2005). He mentioned that FAO, OIE and WHO are working together to enhance multisectoral collaboration at regional and country levels for the prevention and control of emerging diseases including zoonoses through implementation of European Union-funded Highly Pathogenic and Emerging Diseases (HPED) Project and USAID-funded IDENTIFY Project in ASEAN and SAARC countries.

Dr Somsak Pipoppinyo, FAO Representative to Nepal highlighted the importance of multisectoral collaboration for prevention and control of zoonoses and transboundary animal diseases through One Health approach. He highlighted ongoing close collaboration with Association of South East Asian Nations (ASEAN), South Asia Association for Regional Cooperation (SAARC) and Secretariat of Pacific Countries (SPC) for capacity building and promotion of One Health at regional and country levels. Avian influenza, rabies, brucellosis and antimicrobial resistance may be considered as regional priority areas for operationalization of One Health. He elaborated the impact of using chemicals and antimicrobial substances in the name of maximizing agriculture and livestock production and stressed the urgent need of multisectoral collaboration for containment of antimicrobial resistance problem in both human and animal health. He illustrated the challenges for multisectoral coordination and collaboration and greater involvement of international non-governmental organizations at country and regional levels.

Dr Hirofumi Kugita, OIE Regional Representative for Asia and Pacific, mentioned that the growing population and higher income generation demand more livestock products to be made available through intensification of agriculture and livestock production. As a result, the world is facing the unexpected outbreaks of EIDs and 60% of which are of animal origin. He highlighted the importance of awareness and education to control the emerging infectious diseases at the source to safeguard public health threat. He elaborated the role of OIE in developing animal health standards and guidelines for regulating international trade and movement of animals, animal products and prevention of transboundary animal diseases including zoonoses. He also mentioned of OIE/WHO collaboration for development of joint assessment tool for IHR and Performance of Veterinary Services (PVS) and there is a plan to do pilot testing of tool in Thailand and the Philippines in 2014. He urged Member countries and

partners to promote One Health approach for prevention and control of zoonoses and transboundary animal diseases at country level.

Mr Jaya Mukund Khanal, Secretary, Ministry of Agricultural Development, Nepal, welcomed the participants and appreciated the opportunities for hosting the workshop. He shared Nepal experience in dealing highly pathogenic avian influenza in poultry population and its devastating economic impact in national economy. He also lauded gaining momentum of tripartite coordination at the regional level. He mentioned that one health approach has been already integrated in the country programme of Nepal in the wake of avian influenza outbreaks. He anticipated that this workshop will sensitize those countries where one health is still a concept and will come up with practical thoughts to consolidate progress made in operationalization of one health.

Dr Praveen Mishra, Secretary, Ministry of Health and Population, welcomed all participants and hoped that this workshop will provide a platform for sharing country experience and best practices in zoonoses prevention and control. He thanked partners for proposing the workshop on multisectoral collaboration in Kathmandu at a time when Nepal was successful to contain birdflu outbreak in poultry and November is the good time of the year. Since agriculture is the basis of national economy, it is impossible to think about livelihood and trade without livestock and livestock products. He stated that it is difficult to tackle challenges created by climate change, environmental degradation and emerging diseases without considering holistic multidisciplinary approach at the human-animal interface. He also elaborated the correlation of intensification and commercialization of animal production and market driven economy on health and sustainable development. He also stressed the need of a robust surveillance system, cost effective and efficient intervention tools for control of zoonoses and generation of convincing and scientific evidence for policy decision and multisectoral collaboration among national bodies for zoonoses prevention and control.

The WHO secretariat introduced the participants and highlighted the objectives of the workshop. A vote of thanks was delivered to the government of Nepal for hosting the workshop and to the partners for supporting successful organization of the workshop.

Session 2: Update on Regional Disease Situation

The session for the updates on regional disease situation was chaired by Dr Huma Qureshi (Human health) from Pakistan and co-chaired by Dr Sithong Phiphakhavong (Animal health) from Lao PDR.

The review of recommendation of the third tripartite workshop

The recommendation of the third tripartite workshop was presented by Dr Ronel Abila from OIE as it was coordinating last workshop on the behalf of the tripartite group. The workshop made following recommendations;

- to engage and closely collaborate with regional organizations such as ASEAN, SAARC and SPC as well as other international partners to support the national coordination mechanism between animal health, human health and other sectors to address zoonotic and other EIDs;
- to support the implementation of EID and zoonosis by using existing strategy such as APSED and GF-TAD to meet the IHR requirements and OIE standards;
- to promote adoption of One Health approach through enhancing communication and advocacy at all levels;
- to continue collaboration of Member countries on zoonosis prevention and control specifically on priority diseases, rabies, zoonotic influenza and anti-microbial resistance;
- to encourage Member countries to continue improving function of national coordination mechanism and documentation of activities and progress;
- to explore the mechanism to determine the benefit of application of One Health approach through socio-economic assessment and case studies;
- to organize the fourth regional workshop on collaboration between animal and human health sectors within a year.

Dr Ronel elaborated a list of activities carried out for implementation of recommendations by Member countries and tripartite group. He also informed that progress made by Member countries in operationalization of One Health has been included in the meeting report of the third tripartite regional workshop which was shared with participants during this meeting. The fourth regional workshop has been organized by WHO SEARO in collaboration with FAO, OIE and host country in Kathmandu and programme schedule was developed to address priority issues and to share experience and case studies on wildlife, socioeconomics and communication. Poster presentation and questionnaire survey have been designed to evaluate country progress in establishment of a functional coordination mechanism, One Health activities and best practices in last one year.

Regional updates on Zoonosis

The regional updates on Zoonoses covering human health was presented by Dr Frank Konings from WHO Regional Office for Western Pacific (WHO WPRO). He shared the international response to emergence of two novel viruses, i.e. avian influenza A(H7N9) in China and Middle East respiratory

syndrome coronavirus (MERS-CoV) in Middle East countries. He also elucidated the WHO emergency response mechanism and management of Emergency Operation Center (EOC) to outbreak of avian influenza A(H7N9) in China. The major hotspots of EID and the evolution of influenza A virus in the Asia-Pacific Region was described. In addition, the status of human cases of avian influenza (H5N1) in Cambodia, Crimean Congo Haemorrhagic Fever (CCHF) in India, dengue fever, hand-foot-and-mouth disease (HFMD) in the Asia-Pacific region was briefed in light of strengthening surveillance and response activities through implementation of APSED/IHR workplan at regional and country levels. He also mentioned that implementation of APSED strategy was a key for regional health security and it has been tested by the real-time outbreaks and emergency response. Concluding the presentation, he reiterated the international partnership as “All for one, one for all” approach to update the capacity of countries for public health security.

The regional update of Zoonoses on animal health side was jointly presented by Dr Tikiri Wijayathilaka from OIE and Dr Wantanee Kalpravidh from FAO. Dr Tikiri elaborated OIE disease reporting and monitoring system for transboundary animal diseases including zoonoses, i.e. World Animal Health Information System (WAHIS) and the World Animal Health Information Database (WAHID). The rumour tracking system of OIE and the disease trend of Japanese encephalitis, avian Influenza, rabies, echinococcosis and anthrax in animals were highlighted. Dr Wantanee presented the outlook towards better prevention and control of zoonotic diseases by expressing key observations and challenges upon outbreak reporting, information sharing, joint risk assessment, capacity building to detect diseases including multi-sectoral coordination. She also emphasized the technical scopes for enhancing laboratory capacity and quality standards through regional laboratory quality assurance and biosafety program. She updated the status of field epidemiology training programme for Veterinarian (FETPV) in Thailand and China and requirement of further supports for sustainability.

In addition, she updated the status of development of guidelines for surveillance and control of priority zoonoses. She also stressed that sustainability of institutional and capacity building is greatly challenged by political situation, economic stability, human resources and climate change. She stressed the need of tripartite effort to cope with the challenges by concurrently building institutional capacity, policy & strategic planning and advocacy for policy decision in Member countries. She also urged Member countries to ensure transparency for disease reporting and control through political commitment and good governance.

Scientific updates on key emerging diseases of international concern

Professor Hiroshi Kida from Hokkaido University, WHO Collaborating Center for Zoonoses Control/ OIE Reference Laboratory for avian influenza, presented the updates on zoonotic influenza including avian influenza control strategy and pandemic preparedness. He elaborated the changing ecology of the influenza in birds and mammals in terms of origin, subtypes, evolution of virus, emergence of pandemic strains, mutation and genetic re-assortment. He elaborated the status of bird flu vaccine production and use in different countries and highlighted the potential risk of avian influenza outbreaks due to existence of diverse antigenic variants and mismatching of locally circulating strain with vaccine strain. He also provided comparative surveillance data of avian influenza from 1991 to 2013.

The importance of understanding pathogenicity and transmissibility of influenza viruses and the role of pigs in the advent of pandemic influenza virus was also illustrated. He cautioned that it is impossible to eradicate zoonotic influenza due to existence of diverse antigenic variants in humans, domestic and wild birds and continuous interaction among different influenza viruses in nature. He stressed the need of molecular study of influenza viruses to develop appropriate diagnostic tool, effective control measures which should be accompanied with development of information and data sharing mechanism and capacity building in resource constraint countries.

Dr Elizabeth Mumford from the WHO HQ presented the updates of novel coronavirus (MERS-CoV). She informed that 176 human cases were reported with 68 cases deaths between 2012 and November 2013. She pointed out rising public health concern, increasing case loads and spreading of infection in health care facilities. She also stressed the lack of standard mechanism for data collection in particular index and secondary cases, where 59 out of 171 were index cases and the rest 97 were secondary cases. She acknowledged that little is known about epidemiology, source of infection, mode of transmission and role of animal species in maintenance and spread of virus to humans. She also portrayed the known factors of MERS-CoV; assumption of virus ancestor in bats, serological evidence in camel, ambiguity of human contact with camels. She also elaborated the various types of coronaviruses that occurred in human, animal and bats. Finally she also mentioned the challenges of cross-sectoral collaboration, communication among ministries in several affected countries and epidemiological/virological investigation in animals.

The participant from Bangladesh mentioned that rabies is claiming many lives and become serious public health problem in the region, however it was neglected by media as well as the policy makers. He suggested that more attention should be given at regional and country levels. WHO responded that rabies is one of the key priorities for operationalization of One Health and it is an important issue in the tripartite agenda.

Participant from India suggested that it is important to compare human cases of avian influenza with possible poultry outbreaks in Cambodia. WHO responded that the detailed comparison would be shown on avian influenza (H5N1) presentation by Cambodia in next session.

Participant from Malaysia was curious to know any postulates of the localized occurrence of MERS-CoV in the Middle East region and Dr Mumford explained that little information is available about epidemiology and mode of transmission of MERS-CoV and it is still premature to say anything at this moment. The chairperson has a view that there may be a possible connection of camels with localized outbreak of MERS-CoV in the Middle East region.

Session 3: Updates on Facilitating ‘One Health’ coordination at regional and country levels

The poster session was facilitated by Dr Wantanee Kalpravidh from the FAO and Dr Mary Joy from OIE. The aim of the poster session was to encourage active participation and interaction among participants to share country experience and best practices in operationalization of One Health and to identify key action points based on country level experiences.

There were 18 posters presented by the representing countries and additional posters from the partner organizations, such as Hokkaido University, Chulalongkorn University, University of Melbourne, WHO, FAO and OIE. The participants were given three tasks while attending poster presentation;

- Listing the top 3 priority gaps and constraint that facing when applying one health concept in the own country of participant
- List the countries that are facing the similar gaps and constraints
- Identify the solutions that learned from the poster of other countries that can be applied to address the priority gaps and constraints

The poster presentation helped to assess progress made for operationalization of One Health at the country level pertaining to zoonoses prevention and control.

There was a plenary session to review gaps and challenges in operationalizing One Health at country level after poster presentation. The plenary session included two agenda, clarification of the country posters by question and answer on the specific issue and quiz on sharing country experience and best practices.

Major highlights of discussion on country poster presentations

Malaysia: Malaysia has established the inter-ministerial committee and one of the participants wanted to know level of representation and members of the committee and operational part of committee, i.e. frequency of meetings. There are Inter-ministerial committee and intersectoral working group committee that include MOH, Department of Disease Control, Department of Veterinary Services (DVS), Department of Wildlife, Department of Education, Malaya and Putra Medical Committee. Both committees are co-chaired by DG MOH and DG DVS and the meeting is conducted six-monthly and during the outbreaks. The documents and meeting minutes are shared between members by email.

Mongolia: One of the participants would like to know the challenges of operationalization One Health. There were still many challenges in Mongolia, which were not been reflected in the poster, such as documentation and reference materials for one health, collaboration between animal and human health laboratories and insufficient capacity for the prevention and control of zoonoses at the sub national level.

Thailand: There were queries to share the experiences of operationalizing One Health through multisectoral collaboration and One Health University. One Health in Thailand is operationalized through regular meeting of human health, animal health and wildlife sectors at higher level, networking at provincial level and participation of multidisciplinary professionals in FETP, FETPV and FETPW programmes. There are international partners who are supporting multidisciplinary and multisectoral activities to apply One Health concept. One Health University is a network group of academic institutions and universities to operationalize One Health through implementation joint research project on zoonoses.

Japan: Participants were interested to know about multisectoral collaboration for zoonoses and rabies free initiative in Japan. It was informed that direct and day- to-day personnel communication between MOH and MOA was the key for success of intersectoral coordination. Active rabies surveillance, mandatory dog registration and vaccination, ownerless dog control by local municipalities and strict regulation for import of dogs are key intervention for maintaining Japan as a rabies free country.

Pakistan: There was a query on scope and functional aspect of intersectoral coordination committee in Pakistan and it was mentioned that such committee and mechanism exist only for two provinces and it will be necessary to expand to other provinces.

In addition, there were queries on public health interventions for control leptospirosis and toxoplasmosis in Myanmar and Maldives respectively. Similarly participants were interested to know brucellosis situation in human and animals in China and dog rabies control programme in Nepal.

Quiz and sharing the best practices

The first quiz question was to identify countries that conducted the One Health stakeholder meetings based on poster presentation. China, Vietnam, Bangladesh and Myanmar were the countries which organized One Health stakeholder meetings. The best practice for Vietnam was higher level of participation where the national coordination committee was chaired by the Prime Minister since 2004. There were weekly multi-sectoral meeting from 2004 to 2008 considering AI crisis, twice a month meeting from 2008 to 2012 and once a month meeting in 2013 covering AI, rabies and zoonoses and it was good for information sharing and problem solving during outbreaks. Similarly, national coordination committee in Bangladesh was represented by ministries responsible for public health, animal health, wildlife local government and civil societies and the committee meeting was organized regularly including annual One Health conference.

The second quiz question was to mention country that implement collaborative investigation project (CIP) for the rabies prevention and control. Sri Lanka is the country that implemented CIP for rabies elimination. Sri Lanka explained that the target to eliminate human rabies will be achieved through 70% vaccination coverage of total dog population and animal birth control.

The third quiz question was to identify country that operationalized One Health through multi-sectoral coordinated research programme. The country that operates One Health through research programme was Japan. This project was funded by the Ministry of Science and Technology and collaborated by

Ministry of Environment and local institutes. It was the 3 year research project to develop the information system for avian influenza, which comprise location analysis and stakeholder identification and analysis. The outcome of the research project would be released in the next workshop.

Session 4: Strategic update for rabies and AMR in the Asia Pacific Region

This session intended to brief updates and recommendations of international meetings and workshops on multi-disciplinary action on rabies, zoonoses and anti-microbial resistance (AMR) and it was moderated by Dr James Gardner Murray from the OIE.

Dr Gyanendra Gongal highlighted establishment of a functional tripartite coordination mechanism in the region which is successful to coordinate regional and country level activities. He elaborated active participation of FAO, OIE and WHO to facilitate participation of multidisciplinary groups from various countries from the region and coordination of technical discussion during the One Health Conference in Bangkok. He also briefed specific supports for One Health Initiatives in India, Bhutan, Lao PDR, Mongolia and Nepal. The WHO SEARO organized bi-regional meeting of the Asia Pacific Strategy for Emerging Diseases (APSED) in Kathmandu which strongly urged Member countries to further strengthen the functional coordination mechanism between human health, animal health and other sectors.

WHO SEARO organized Regional Meeting on Zoonotic Diseases in Chiang Mai in August 2013 which was attended by human health and animal health officials from 10 Member countries. WHO in collaboration with FAO and OIE briefed of tripartite coordination for containment of AMR and prevention and control of avian influenza, rabies and other zoonoses. The meeting recognised AMR as an emerging problem at the human-animal interface and recommended tripartite group to support Member countries to develop multisectoral action plan for containment of AMR through advocacy and awareness at policy and professional levels. Rabies has been identified by ASEAN and SAARC countries as regional public good and WHO SEARO has been advocating Member countries to develop a comprehensive rabies elimination programme based on Regional Strategic Framework for rabies elimination. All countries in WHO South-East Asia region have discontinued production and use of nerve tissue rabies vaccine and WHO has been advocating introduction of cost effective intradermal rabies vaccination in order to improve accessibility and affordability of modern rabies vaccine in rabies endemic countries. He elaborated tripartite collaboration for supporting ASEAN and SAARC initiatives for rabies elimination.

Dr Katinka de Balogh from the FAO HQ, elucidated the background of the use of antimicrobial substances for animal production and disease control. She emphasized that the need of a holistic multidisciplinary approach and global partnership for containment of AMR. She rationalized the FAO/OIE/WHO tripartite collaboration for AMR in awareness, situation analysis, policy development and implementation. She also defined the methodology for assessment and management for AMR. She highlighted social economic burden of rabies and shared the impact of mass dog vaccination in elimination of human rabies in Mexico and Indonesia. She also addressed the requirements of legislation, political support, funding for the development of the conceptual framework for control and subsequent elimination of dog rabies.

Dr Mary Joy from OIE described the OIE standards and guidelines for rabies prevention and control. The OIE has established a regional rabies vaccine bank under the EU funded HPED Project and dog rabies

vaccines have been distributed to ASEAN and SAARC countries to control rabies at source. She also highlighted OIE support for rabies awareness such as development of IEC materials for mass dog vaccination, world rabies day celebration and intersectoral workshop for ASEAN rabies prevention and control. She also described the future supports to Member countries for development of national dog rabies control plans through implementation of special regional pilot projects.

She described OIE Code, Standards and Recommendations for prudent use of antimicrobial substances in animal production and disease control and highlighted the need of containment of antimicrobial resistance in animals. She elaborated existence of OIE list of important antimicrobial agents for veterinary use and scientific publication for containment of AMR. She also mentioned the growing concern of AMR as 152 out of 178 OIE Member countries have responded to global questionnaire on antimicrobial use. She also narrated the recommendations of the global conference on responsible and prudent use of antimicrobial agent for animals which was hosted by the OIE in Paris in May 2013. The conference discussed issues like implementation of international guidelines, legislation and regulation, compliance with ethics and codes, advocacy, sharing good practice and research and innovation for responsible and prudent use of antimicrobial agents.

There was panel discussion after the presentations which have been summarized as follows;

Participant from Bangladesh requested to elaborate WHO plan to support implementation of the Regional Strategic Framework for rabies elimination: WHO is working together with FAO and OIE to support ASEAN and SAARC initiative for rabies elimination. WHO has been working with the SAARC Secretariat to advocate Member countries for rabies elimination for SAARC countries and supporting SAARC countries to develop a national rabies control/elimination plan and to build national capacity. It is necessary to use innovative approach for resource mobilization and WHO facilitated development of 'SAARC Rabies Elimination Project' which has been submitted to the SAARC Development Fund for consideration. WHO is engaged with international partners to develop partnership for rabies elimination in the region.

There was a query about supply of human and dog rabies vaccines through rabies vaccine bank. The OIE has already established a regional dog rabies vaccine bank which is available for rabies endemic countries which may be reinforced through various pilot projects in future. FAO highlighted the principle and effectiveness for vaccine bank for emergencies and development of roadmap for rabies elimination. It was stressed that understanding the epidemiology of dog rabies is important for planning the dose and supply of vaccine as well as convincing partners about cost-effectiveness of funding dog vaccination campaign for prevention of human rabies. However, there is no plan for establishment of such bank for human rabies vaccine and WHO is focusing on promoting cost-effective intradermal rabies vaccination as accessibility and affordability of modern rabies vaccine is critical.

Participant from Timor-Leste acknowledged WHO and FAO for providing technical support in development of contingency plan for rabies prevention and he was requesting tripartite group to help in declaring and maintaining rabies free status of Timor-Leste. Timor-Leste is historically rabies free country but it will be necessary to follow OIE/WHO guidelines for declaring rabies free country. DefiniTel.

No.: y it will be necessary to build national capacity for surveillance and response as outlined in the rabies contingency plan. It is important to initiate dialogue with Indonesia for arranging diagnosis of rabies and emergency supply of human vaccine. OIE elaborated technical requirements to be met for declaring rabies free status. FAO suggested that Timor-Leste should develop a national planning for surveillance and try to arrange capacity building through bilateral collaboration with Indonesia.

India was interested to know about the role of wildlife in maintaining sylvatic rabies. The OIE explained successful use of oral bait rabies vaccine for elimination of fox rabies in Europe. There is spillover of dog rabies virus in wildlife population and therefore it is important to focus on dog rabies elimination. It was informed that Member countries raised the issue of wildlife rabies during the regional OIE meeting and it would be the priority issue for the next meeting.

Participant from Malaysia drew attention of a clear definition for rabies free areas or zones. The OIE explained that there is OIE Code for declaration of rabies free status. WHO SEARO informed that the condition of declaration and maintenance of rabies free status has been included in the Strategic Framework for rabies elimination. It was stressed that active surveillance, responsible dog ownership, strict control of dogs at point of entry and epidemiology-based preventive activities are key criteria for declaring and maintaining rabies free status.

The chairman highlighted that participants were more concerned about rabies but less worried about AMR. Many references revealed that AMR is going to be a major problem in future unless animal health and human health sectors work together to advocate and promote responsible and prudent use of antimicrobial agents in humans and animals. He urged the need of multidisciplinary approach, country commitment and resource allocation for protection of antimicrobial arsenal for saving human and animal life and containment of AMR.

Session 5: Application of One Health Strategy to Specific Zoonotic Diseases

The recap of the previous day long workshop was presented by Dr Pasang Tshering from FAO at the beginning. The application of One Health Strategy to specific zoonotic diseases was chaired by Professor Be-Nazir Ahmed from Bangladesh and co-chaired by Dr Sithong Phiphakhavong from Lao PDR. There was an overview of avian influenza situation in Indonesia, Nepal, Cambodia and China and these countries shared their experience in controlling avian influenza.

Dr Yuni Yupiana from the Livestock and Animal Health Service, Indonesia shared the overview of highly pathogenic avian influenza (HPAI) in Indonesia. She described the epidemiology of HPAI and identified that live bird market and movement of poultry through transportation network as an important factor for the spread of the HPAI virus. She then shed light on implementation of the National Strategy for control HPAI including intersectoral coordination. She explained that human health and animal health sectors are working together for active surveillance of HPAI and focal culling, decontamination, poultry vaccination are carried out for containment of HPAI outbreaks. She also shared the updates on extended surveillance of live bird market for avian influenza A(H7N9) and all poultry samples have been tested negative. She emphasized the effectiveness of integrated zoonotic disease control at the community level by organizing joint training, information sharing and coordination among all stakeholders for better implementation of the control programme.

Dr Bodh Nath Adhikari from the National Poultry Diseases Diagnostic Laboratory, Chitwan presented the background situation of HPAI in Nepal. He reported that poultry sector contributed 3-4% of gross domestic product (GDP) and recent epizootics of HPAI in Nepal have direct impact on the poultry industry and national economy. He also explained the epidemiological reporting systems for HPAI in Nepal and focused surveillance in LBM, backyard, commercial poultry and wild birds. He elaborated the risk zoning of HPAI in Nepal and explained the trend of HPAI outbreaks between 2009 and 2013. The government has to spend huge budget to carry out culling operation and to compensate poultry farmers in 2013 outbreaks. He highlighted the challenges for HPAI control due to evolution of HPAI viruses and continuous outbreaks between 2009 and 2013 due to movement of poultry and poultry products. He also stressed the need of technical and financial resources, communication and public awareness for prevention and control of HPAI.

Dr LY Sovann from the Department of Health, Cambodia presented avian influenza situation in Cambodia as large numbers of human cases of influenza A(H5N1) were reported in 2013. He shared information on systematic human influenza case detection through Event-based surveillance (EBS), Influenza like illness (ILI) and Sever Acute Respiratory Infection (SARI) surveillance. He then described the epidemiology of avian influenza A(H5N1) in poultry and humans between 2005 and 2013. Regarding the risk assessment, he mentioned that the HPAI is embedded in backyard poultry population and therefore sporadic human cases are expected due to risky behaviour such as contact with dead and sick poultry and de-feathering practices in rural areas. So far, there was no human-to-human transmission

reported in Cambodia. Regarding intersectoral coordination and collaboration, he stated that there is a MoU between two ministries and human and animal health sectors are closely working together for prevention and control of zoonoses including avian influenza. The strategic framework for prevention and control of priority zoonoses exists and the workplan for 2014 has been drafted. He also elaborated the case investigation, laboratories testing, health education and surveillance systems for avian influenza A(H5N1). He also mentioned that a pilot project has been launched in identified hot spot area for joint outbreak investigation and response to avian influenza A (H5N1) and a research study has been initiated for determining sero-prevalence in high risk population against AI A(H5N1).

Dr Zijian Feng and Dr Zhang Yito from the People's Republic of China provided an overview of government emergency response to human infection with avian influenza A(H7N9). They described the virological, epidemiological and clinical features of human cases with novel avian influenza A(H7N9) in the People's Republic of China. AI A(H7N9) viruses isolated from human cases shared high homology with the viruses isolated from poultry in live poultry markets. AI A(H7N9) appeared to be low pathogenic to poultry and human infection was indicative of on-going infection in live bird market. There were total of 136 cases with 44 deaths in Mainland China and one confirmed case reported from Taiwan. It was evident that 69% of human cases were due to exposure to poultry in live bird market. The serological study was done in 1544 poultry workers from four provinces to understand the magnitude of human infection and it was found that all tested negative to AI A(H7N9) specific antibody. The significant risk factors identified by the case-control studies were direct exposure to poultry and existence of underlying chronic illness among those who were exposed to live poultry or who visited live bird market. It was found that 70% of human cases were exposed to poultry and there was a limited human to human transmission in 4 family clusters.

They did comparative analysis of human cases due to avian influenza A(H7N9) and A(H5N1) and it was revealed that median age of A(H7N9) patients was 62 whereas it was 26 among A(H5N1) patients. Interestingly 72% A(H7N9) patients were from urban areas whereas it was not significant among rural and urban dwellers. They also explained the emergency response taken by public health animal health authorities, such as activation of multi-sector prevention and control mechanism, rapid notification and announcement, joint risk assessment, information and virus sharing, surveillance, rapid laboratory diagnosis and field research to support policy decision. Closer of live bird market was single most effective measure which reduced human infection by 97 to 99%. There was a better coordination with FAO, OIE and WHO to ensure transparency in outbreak reporting and collaboration with high risk countries. They also elaborated government response to outbreak through on-going surveillance, supervision and restriction on poultry movement, LBM management and revival of poultry industry and stabilization of poultry production and market supply.

Discussion

Participants raised lots of questions related to evolution of AI A(H7N9), sampling strategy for detection of A(H7N9) in live bird market and strategy for control of spread of infection to neighbouring provinces. FAO highlighted that coordination was important for the decision of LBM closure and there was spread through secondary routes or leakage when LBM was closed. It was explained how China would manage

traders to protect the secondary leakage to the neighboring provinces. It was acknowledged that ban on poultry movement to the neighboring provinces was a big challenge and the government promoted awareness to change the consumer habit. It was necessary to consider compensation policy to enforce ban on live poultry movement and secondary leakages.

Regarding AI A (H5N1) situation in Cambodia, participants were interested to know the functional aspect of event-base surveillance system and any public health intervention to prevent human exposure to A(H5N1). The EBS was established in 2003 and the joint outbreak investigation protocol was developed. Although human cases due to A(H5N1) were reported in large numbers as compared to previous years, less number of patients died because of improved health care seeking behavior, alertness among clinicians and better risk communication. It was mentioned that Cambodia could not work towards providing compensation to farmers and enforce closure of LBM due to the lack of policy, concrete action plan and resources for its implementation in hot-spot areas.

Re presentation of AI A(H5N1) in Nepal and Indonesia, participants were interested to know risk mapping of AI A(H5N1) in Nepal. Nepal elaborated that poultry distribution, poultry movement and past incidences were the key criteria for risk mapping. In response to the existence of AI A(H5N1) studies for wild birds in Indonesia, it was informed that study of migratory birds was conducted in 2007. There was a query on surveillance, prevention and control activities in autonomous islands of Indonesia. Indonesia elaborated ongoing participatory diseases surveillance and response (PDSR) and early warning and alert response system (EWARS) and collaborative activities between human health and animal health sectors at provincial level. Dr Elizabeth Mumford reiterated the need of developing SOP for joint outbreak investigation of avian influenza and suggested tripartite initiative to prepare joint SOP, guidelines which may come up as one of the recommendations of the workshop.

Panel discussion on finding gaps and challenges among countries

The panel discussion on identifying the gaps and challenges for developing coordination mechanisms was moderated by Dr Subhash Morzaria from FAO with six panel members from the Member countries.

Dr Sinurtina Sihombing from Indonesia shared the experiences of challenges on highly pathogenic avian influenza surveillance, prevention and control, which was first reported in poultry in 2003. The HPAI rapidly spread to 15 of the total 33 provinces in 2005. So far, Indonesia has reported 195 human cases including 163 deaths. She highlighted the success factors such as development of National Zoonosis Commission in 2011, better data sharing, strengthening laboratory diagnostic capacity at sub-national level and sustainability of PDSR which was possible through technical support from WHO, FAO and OIE and international partnership. She also identified the challenges for coordination such as, decentralization of government services, limited budget, huge geographical area to cover and insufficient veterinary professionals at sub-national level.

Dr Wirongrong Hoonsuwan from Thailand highlighted the strengths of existing coordination mechanism in Thailand. The National Intersectoral Committee is chaired by the Vice Prime Minister and there is a mechanism for good information sharing between public health and animal health sectors. She also elaborated the challenges such as need of advocacy for better coordination at provincial and district level, inadequate information sharing with private sector and the overlapping of activities between various agencies.

Dr Rajendra Bambal from India shared the success of having the animal health legislation for animal disease notification, mechanism of information sharing at higher level, involvement of international organization, joint monitoring group and joint investigation with the involvement of animal health, human health, wildlife and other stakeholders. He also described the progress of national brucellosis control programme and FETP at NCDC. He highlighted the challenges in conducting the regular meeting between different sectors, coordination of various agencies for surveillance and response to public health emergency at state and district level, sustainability of training and collaboration with wildlife.

Dr Kazuko Fukushima from Japan shared the success of the national level collaboration through frequent communication and exchange of information, development of national framework for AI and rabies and investment of epidemiological and biological research for zoonoses. She also highlighted the challenges at local level such as lack of One Health approach, difficulties in communication between different sectors and the different strategies for different sectors.

Dr Rizza Araceli Salinas from Philippines shared the success of having a national wildlife policy signed by the president of the Philippines in 2010 and drafting joint rules and regulation using One Health approach. She also highlighted the gaps such as difficulties in organizing meeting between technical advisory group (TAG) for planning and implementation, lack of national funding to implement agreed

and planned activities, inadequate veterinary workforce for wildlife sector and difficulty to get training and access to information at the local level.

Dr Dolgorkhand Adiyadorj from Mongolia shared the success stories in strengthening intersectoral collaboration such as quarterly and annual meeting of major stakeholders, establishment of animal-human health committee, feedback and information sharing system, and implementation of active surveillance of exotic disease like CCHF through pilot project in border of China and anthrax joint outbreak investigation. She appreciated the World Bank project for risk assessment of zoonosis and FETP on rabies and echinococosis.

Moderator highlighted the importance and usefulness of sharing country experiences on multisectoral coordination and collaboration through this kind of platform in order to overcome the challenges identified by panelists. He expressed deep appreciation of the successful multisectoral coordination in China for emergency response to AI A(H7N9) outbreak as the model of coordination mechanism for all emerging diseases. He also stressed the need of multisectoral collaboration for the long-term endemic diseases.

Vietnam also shared the success of engaging the decision makers to the meeting, involving high ranking officials in national steering committee and utilizing opportunities of online conference and Tel. No.: econference in response to outbreak of emerging and endemic diseases. The importance of monitoring the activities at LBM and the collaboration with the Ministry of Trade for controlling illegal poultry movements was also highlighted. However Vietnam is facing challenges in engaging the local authorities and communities in One Health mission as they are not aware of One Health.

Pakistan also shared the experiences of developing coordination mechanism and contingency plan. However, there are many challenges for promoting One Health approach such as no legal provision for One Health approach, lack of political commitment as well as cooperation at administrative level, challenges for joint risk assessment and information sharing and insufficient human resources. In addition, there was no specific funding mechanism at the government as well as donor level to support and sustain One Health approach for zoonoses prevention and control.

WHO, FAO and OIE also shared the success of good communication among three organizations such as joint risk assessment and training and development of joint project proposal for collaborative activities, i.e. EU-funded HPED project, USAID funded IDENTIFY and AI A(H7N9) Project. OIE also elaborated the achievable activities of One Health frameworks for countries in terms of knowledge, individual culture, policy, epidemiology and different funding status of the individual countries. The importance of advocacy for political commitment, One Health approach for EIDs and rabies and the interpersonal relation in communication between tripartite groups was also highlighted by partner organizations. Dr Frank Konings from WHO also highlighted the challenges such as engaging wildlife sector in zoonoses prevention and control activities, different priorities of different sectors, different administrative structure in different countries and difficulty in policy coordination.

The chairman commented that tripartite groups have to keep engaging the national authorities to promote One Health coordination and awareness. He also highlighted **that the success stories and good**

practice in operationalization of One Health may be used to convince the national authorities. He also gave example of best practice of FAO initiative for avian influenza, where FAO had already worked with different ministries at country level and different divisions and units under the FAO. He also stressed the need to advocate One Health approach at national and sub national levels which will require funding support from government and international partners.

On behalf of partner institutions, the **Massey University** shared the success stories of one health epidemiology capacity building mechanism under World Bank-EU funding support, endorsement of one health hub organizational framework in south Asia, collaborative investigation projects, joint training of animal and human health sectors, communication tools and mechanism for social media. The challenges for extended communication between different sectors, political commitments and government funding of the projects were also emphasized. **AUSAID** also highlighted that aid activities for EIDs were in the second phase and described about the focus aids activities, such as rabies and animal health strategy in South East Asia in future to support operationalization of One Health.

Professor Kida from the **Hokkaido University** appreciated tripartite group for creating platform for sharing country experience in establishing multisectoral collaboration and promotion of One Health and suggested to continue such activities for zoonoses prevention and control at regional and country levels in future. The **Harbin Veterinary Research Institute** of China shared the information about the support and models of training on One Health courses such as Master degree and distance education. It was informed that the institute also provides confirmatory and reference laboratory services for zoonoses and supports agricultural research projects in the spirit of One Health.

The **USAID** highlighted the opportunities for operationalization of One Health in the wake of avian influenza and pandemic influenza outbreaks and shared comparative advantage to promote One Health approaches in surveillance, outbreak investigation and programme management which provided remarkable results and it may be applicable for other emerging diseases. The **US Department of Agriculture (USDA)** also identified the specific funding for more activities supported by US CDC and expressed possible funding support for monitoring the One Health activities in future. The chairman also highlighted that rabies control and subsequent elimination campaign in ASEAN and SAARC countries may serve as a model for operationalization of One Health and it is gaining momentum as there is common interest of different sectors such as human health, animal health and local authority.

Breakout Sessions: The Group work for Multisectoral collaboration for Live Bird Market management

This session was moderated by Dr Norikazu Isoda from WHO WPRO. This session engaged participants to share their experiences and lesson learnt in managing live bird market (LBM) from participating countries in order to suggest risk assessment, surveillance and risk reduction measures for better management of LBM through coordination and collaboration between animal and human health sectors. A briefing was given to participants and facilitators about the objectives and scope of group work. Dr Norikazu Isoda highlighted the crucial role of LBM in amplification and dissemination of avian influenza viruses and the high risk location for potential transmission of zoonotic influenza to humans. He also elaborated the criteria for closure of LBM and involvement of multisectoral authorities for decision making, implementation, monitoring and evaluation of LBM activities. He also described joint outbreak investigation, surveillance and joint risk reduction for LBM, establishment of healthy village and market campaign through application of biosecurity measures at various stages as a longer term strategy.

There were three groups with following tasks focused on LBM; (i) joint risk assessment (ii) surveillance and monitoring and (iii) options for risk reduction measures. The group composition was as follows considering country experience and representation of different sectors;

- Group (i) Bhutan, People Republic of China, Mongolia, Nepal, Pakistan and the Philippines.
- Group (ii) Cambodia, India, Japan, Lao PDR, Myanmar, Sri Lanka, Vietnam
- Group (iii) Bangladesh, Indonesia, Malaysia, Maldives, Thailand and Timor-Leste

Group (i) revisited the current multisectoral coordination mechanism existing in various countries and assessed whether the joint risk assessment could be implemented. The group discussed the effective ways to to implement the risk assessment intervention in LBM. This group identified factors, such as, the policy agreement, legal/regulatory agencies and experts, establishment of technical committee, authority for decision making, information sharing mechanism and SOP development.

The group identified key stakeholders to be included in the working group for risk assessment of LBM such as health, agriculture, livestock, trade, local governments, wildlife and environment, universities, private sectors, transport, customs and media. The group also suggested that there should be a joint committee of public health and animal health sectors formalized at local and central level with the participation of technical experts and policy makers representing different sectors.

The group suggested that the joint risk assessment working group should come out with a clear recommendation to be considered by decision makers so that appropriate action could be taken at both central and local government levels. The group also suggested that key actions should be based on outcome of the risk assessment with clear criteria and instruction such as closure of LBM, disinfection

and the duration of closure. The other requirements, such as, SOP for proper disinfection and cleaning, surveillance of market, filling the information gaps were also suggested by the group.

Group (ii) discussed the technical requirement for surveillance of LBM such as protocol, sample collection, laboratory capacity and training of field staffs. The requirement of financial support to implement and sustain active and passive surveillance was also highlighted.

The group identified animal health sector and human health sectors as the key partners for execution of LBM surveillance. The overall structure of active surveillance was suggested to generate evidence-based information through assessment of AI virus load, virus circulation in market area, spread of AI viruses at different stages (farm, wholesale, retail) so that timely and appropriate response could be recommended for policy decision.

The group suggested that surveillance should include human health and animal health components. The first should include event-based surveillance and ILI/SARI surveillance and the second should include the virological and serological surveillance including environmental sampling and sentinel animal. The group also recommended that information sharing between animal health and public health sectors should be on a daily basis whereas sharing information of confirmed animal or human cases of AI should be mandatory during outbreaks. It is suggested to share routine surveillance data to sustain LBM surveillance activities under normal condition.

Group (iii) revisited the interventions during and after the outbreaks in terms of efficacy of risk reduction, requirement for implementation and sustainability of risk reduction measures at LBM.

The group suggested that stamping out and disinfection in infected farms, poultry movement control, active surveillance and hygiene improvement should be done during AI outbreaks by the animal health sector whereas ILI/SARI surveillance of farm workers, transporters, LBM workers should be done by the human health sector. It is important that both sectors should jointly develop communication plan and awareness activity during outbreaks.

The group recommended active surveillance, biosecurity measures at LBM, weekly closure of LBM for hygiene and disinfection, regular medical check-up of LBM workers and raising public awareness as key interventions to be executed during post-outbreak period. The group also identified long term risk reduction measures such as the rest days, species segregation, prohibitions of the certain animal species and hygiene improvement to be executive in a cost-effective way to sustain healthy food market practice in LBM.

Parallel sessions for Wildlife, Socioeconomic dimension of zoonosis and Communication.

Wildlife

The session was moderated by Dr James Gardner Murray from the OIE.

Dr Supaporn Wacharapluesadee from the WHO Collaboration Centre for Research and Training on Viral Zoonoses, Chulalongkorn University presented the possible dangerous zoonotic pathogens in bats and risks of potential human exposure to bat-borne pathogens. She elaborated bat as a reservoir of zoonotic pathogens such as lyssavirus, Nipah virus, Hendravirus, Ebola virus, Sever acute respiratory syndrome (SARS) and histoplasmosis. She then described the results of zoonotic pathogen assessment of bat guano and risk assessment of potential exposure among guano workers and community members. She also highlighted the requirement of systematic surveillance and education of local community, where human lives in close contact with bat guano or animals infected by bats in the same area.

Dr Jia Honglin from the OIE Reference Laboratory for AI, Harbin Veterinary Research Institute made presentation on overview of zoonoses and zoonotic pathogens originating from wildlife animals in China. Rabies and brucellosis are major zoonotic diseases of public health concern. Dog bite is responsible for 95% of human rabies cases reported in China. Badger bite has been new source of rabies infection in Hangzhou and Huzhou city. Taiwan was rabies free for 52 years and rabies among ferret was reported at the end of 2012. He shared survey results of rabies in yellow mongoose, ferret badgers and various types of bats in China. He emphasized the need of practical measures such as law enforcement for dog rabies control, development of oral bait rabies vaccine for stray dogs and investment on rabies research. He described brucellosis as an emerging disease problem in last 10 years and shared results of sero-survey of brucellosis in wild animals. He then elaborated the distribution of animal brucellosis in China and informed that there is a plan to integrate brucellosis into the regular monitoring systems, and introduce compulsory immunization of livestock against brucellosis beginning from 2015.

Dr Honglin also described the mosquito-borne Japanese encephalitis, tick-borne encephalitis and Crimea-Congo Hemorrhagic Fever (CCHF) in China. He also highlighted that more than 300,000 samples were collected in 20 provinces of China between 2000 and 2009 for identification of arboviral infections. He also informed that new mosquito-borne emerging infectious diseases have been identified affecting human population, i.e. human infection with Tahyna virus, in northwestern China and tick-borne severe fever with thrombocytopenia syndrome (SFTS) in northeastern China. He said that implementation of stamping out policy for zoonoses elimination may not feasible and practical at present considering large population of animals and development of livestock industry and control strategy through mass vaccination might be a better choice. It is right time to discuss and evaluate One Health concept and to establish multisectoral collaboration for zoonoses prevention and control at national and local levels.

Dr James Gardner Murray expressed his opinion that stamping out of wildlife animals in the name of zoonoses prevention and control would not be an ideal approach for One Health implementation as

there may be public mistrust for One Health due to animal welfare concern. The wildlife group also discussed increasing risk and high impact of zoonoses in wildlife and identified other alternative strategy for wildlife disease control rather than stamping out such as development of appropriate vaccine and delivery system, development of wildlife medicine and manpower, operational research, risk communication and political support. The group also recommended advocacy and awareness on wildlife conservation at policy and community levels so that it will prevent wild animals to come into close contact with human and domestic animals.

Socioeconomic dimension of zoonoses

Dr Wantanee Kalpravidh and Dr Eric Brum from the FAO facilitated this session. They presented the epidemiological and economic principles of rabies control, the basic reproductive numbers and expected numbers of secondary infection (R_0) resulting from point source infection in susceptible population. They also described the limitation of dog culling and identify the ways to reduce rabies (R_0) by effective dog vaccination and sustaining herd immunity. They also elaborated the cost-benefit analysis for rabies control and urged investment for dog vaccination as it is cost-effective and sustainable towards rabies elimination. Rabies elimination may serve as a model for operationalization of One Health as human health and animal health sectors have to work together.

Professor Kohei Makita from ***Rakuno Gakuen University***, Japan presented justification for application of socio-economic analysis in relation to zoonoses. He identified several socio-economic factors for food safety in the value chain from farmer, trader, house-hold to the consumption level.

Based on the concepts of rabies and food safety, the group assessed the country's understanding of socio-economic dimension and the status of the application of this discipline for zoonoses prevention and control. The group agreed that socioeconomic dimension of zoonoses must be considered so that policy makers and general public understand cost-effective way of controlling zoonoses at the human animal interface, i.e. controlling disease at source will be cost-effective, sustainable and logical. There is a need of expertise to link epidemiological data with socioeconomic analysis to propose appropriate socially acceptable, cost-effective intervention tool to policy makers. Capacity building is required to carry out socioeconomic analysis of zoonoses as it is still a new concept. The group recommended simple and meaningful messages to advocate the policy makers and donor to support case studies and capacity building for socioeconomic analysis of zoonoses in countries of the Asia-Pacific region.

Communication

Dr Prakash Ghimire from WHO moderated this session and he elaborated definition, methods, tools and channels for communication with policy makers, public and social media. He stressed that communication linked to social, economic, political and environment in broader dimension. He focused the four communication skills and how to communicate effectively such skills in the different situations and different contexts.

He also elaborated the communication strategies such as Regional Communication Strategy Framework against Infectious Diseases in Asia and the Pacific and the Communication for Behavioural Impact

(COMBI) for the prevention and control of emerging diseases including zoonoses. He also highlighted communication tools such as WHO outbreak communication planning guides, COMBI toolkit and WHO field guide for effective media communication during public health emergencies.

The group discussed the guiding principles for communication, such as, greater community participation, development of One Health curriculum for communication, enhancing capacity of technical professionals to communicate during outbreaks and emergencies and establishing the regional network of coaches/ mentors and community-based communication networks. The group also discussed about the seven COMBI steps and shared the country experiences such as identifying behaviour objectives, conduct rapid situation analysis.

The group suggested that it is necessary to refine the behavioural and communication objectives, to design communication strategy and to prepare implementation plan considering local situation and context. There was a consensus that implementation plan including monitoring and evaluation should continue when the outbreak is over. The impact assessment of risk communication and documentation of lesson learnt should be considered as it will contribute to better planning in future communication. The group also recommended the simple and common message in a timely manner to communicate with public and policy makers during disease outbreaks and emergencies.

Session 6: Application of One Health approach

Day three sessions were chaired by Mr Ibrahim Zuhuree from the SAARC Secretariat and co-chaired by Dr Ken Cokanasiga from the Secretariat of Pacific Countries (SPC). Dr Prakash Ghimire from WHO recapped the previous sessions of day two and Dr Gyanendra Gongal from WHO, Dr Katinka De Balogh from FAO and Dr Peetambar Kushwaha from the Global Alliance for Livestock and Veterinary Medicine (GALVmed) presented the updates on prevention and control of neglected zoonoses.

Neglected Zoonoses

Dr Gyanendra Gongal provided background of neglected tropical diseases (NTDs) and described the common features of NTDs such as low visibility, link to poverty, trigger stigma and discrimination, impact on morbidity and mortality and neglected in research. He mentioned that 6 out of 17 priority neglected tropical diseases are zoonoses. He highlighted risk factors, challenges and opportunities for prevention and control of neglected zoonoses prevalent in countries of the Asia-Pacific region. He also described the burden of neglected zoonoses and its impact on the income of the economies. WHO has developed strategic approaches for the prevention and control of NTDs, such as, case management, transmission control and preventive chemotherapy or prophylactic vaccination. The roadmap for NTDs urges all partners to work together in cost-effective, flexible and innovative way considering country specific situation. WHO hosted the interagency meeting on planning prevention and control of neglected zoonoses in July 2011 in Geneva which was attended by FAO, OIE and international experts.

He provided situation analysis of echinococcosis/hydatidosis, taeniasis/cysticercosis, cutaneous leishmaniasis, schistosomiasis, food-borne trematodes in Asia-Pacific region and addressed the essential interventions, such as strategy development, policy actions, research needs. He also elaborated WHO initiative for disease mapping, multidisciplinary action and mass drug administration designed to prevent and control foodborne trematodes in Asian countries.

Dr Katinka De Balogh described the three main FAO approaches to zoonotic diseases, neglected/endemic zoonoses, emerging zoonoses and food-borne zoonoses. She explained that the problem of neglected zoonoses is closely linked to poverty, ignorance, lack of services in rural areas and lack of disease burden data. She also established linkage of NTDs to livelihood, wildlife and livestock production. She shared outcomes of the High level Technical Meeting at the human-animal-ecosystem interfaces and the elements of effective cross-sectoral collaboration to address NTDs.

Dr Peetambar Kushwaha introduced scope and objectives of the Global Alliance for Livestock Veterinary Medicine (GALVmed) and explained international partnership for animal health product development and adoption. The GALVmed is a non-profit international organization which has pro-poor focus to improve quality of life of livestock, sustainable development and food security through vaccine development and technology transfer. The organization is involved in vaccine development and clinical trial for prevention and control of hydatidosis, cysticercosis and Newcastle disease but his presentation was focused on cysticercosis problem in Asia and the scope of vaccination of pigs against cysticercosis in South Asia.

The chair and co-chair discussed the way forward to address the endemic neglected zoonoses and participants described the actions, such as, stimulating dialogues and reporting, assessing the disease impact and burden, raising awareness and advocacy, defining viable strategies and mobilizing resources. The participants also suggested to consider integration of the poverty reduction measures while designing pilot projects for neglected zoonoses .

Application of One Health Approach

Dr Susan Corning from OIE presented the updates of the tripartite One Health approaches. She highlighted that emerging zoonotic pathogens have been at centre stage of global health security in recent years which demand a holistic multidisciplinary approach and collaborative action. She addressed that WHO, FAO and OIE have quickly coordinated complex avenues for cooperation between authorities and agencies at national, regional and global levels. She addressed the tripartite strategic approach for multi-level coordination; providing practical external expertise, tripartite tools and activities. She also recommended additional values for One Health such as leadership, technical expertise, engagement of national authorities and adaption of international standards and regulations. The outcomes of the global policy and technical meetings for the prevention and control of transboundary animal diseases including zoonoses and antimicrobial resistance were shared. She also highlighted the need of health system strengthening including laboratories capacities in both animal and human health sectors for zoonoses prevention and control. It is necessary to improve synergies between two sectors and the alignment with existing systems/ framework, such as IHR (2005) and OIE-Performance of Veterinary Services (PVS). WHO and OIE are working together to develop a common assessment tool in line with IHR and PVS and pilot testing will be done in Thailand and the Philippines in 2014.

Dr Wantanee Kalpravidh from FAO revisited the country questionnaires and posters focused on assessment of operationalization of One Health at country level. It was revealed that measurable progress has been made in operationalization of OH in many countries and success stories have been shared by participating countries. However some challenges also remained such as political commitment, ownership by governments and communities, leadership development, advocacy and coordination at sub-national level and international partnership.

There were a number of zoonoses prioritized by participating countries and zoonotic events were reported by most countries in 2012-13. Avian influenza, rabies, brucellosis, anthrax and leptospirosis have been identified by most countries as priority zoonoses. HPAI (H5N1) was most common zoonotic disease reported by Vietnam, Myanmar, Indonesia, Cambodia, Bhutan, Bangladesh and Nepal whereas rabies was considered the most important zoonotic disease occurred at the human-animal interface in Vietnam, Myanmar, Mongolia and Lao PDR.

Regarding the National One Health mechanism, 32 % of countries stated that the pattern of priority zoonoses is changing. Avian influenza A(H7N9) was a low pathogenic to poultry but it became priority disease in China in 2013 as human infection was reported. Eighty-four per cent of participating countries claimed that they have a national One Health mechanism and 75% of them claimed legal recognition of

OH mechanism. The OH team meets regularly in most countries but only 69% countries claimed that they also receive funding support for OH activity.

Regarding operationalization of OH, majority of countries reported that OH coordination was useful in preparedness, collaboration and sharing information which contributed to improve mutual understanding and trust and to develop joint activities for zoonoses prevention and control. Practical examples and challenges were also identified.

Regarding key supporting elements for One Health coordination and collaboration, it was emphasized that the following elements are pre-requisites for establishment of a functional coordination mechanism; strong political will and commitment, trust among partners, common objectives, recognition of shared benefits, identification and involvement of stakeholders and effective health system. However, good governance, legal framework, guidance on implementation of cross-sectoral collaboration, pool funding may be supporting elements. Regarding the key operational elements, most countries indicated that there should be routine communication and common interest for joint planning, coordination and collaboration for disease control activities. However joint risk assessment and joint simulation exercise were not practiced due to complexities and lack of technical expertise and funding.

In addition, eight key gaps and challenges were identified as follows; lack of clear intra and inter sectoral coordination mechanism, no clear operationalization of OH at local level, legislation to support OH, high level commitment, different priority among partners, financial support, human resource, time and poor involvement of wildlife/ environment sector.

Panel discussion on vision for One Health

The panel discussion on One Health (OH) at the regional level was moderated by Dr Subhash Morzaria from FAO and the representatives from the donor and partner organization participated in the discussions.

Ms Joanna Mckenzie from ***Massey University, New Zealand*** highlighted the role of World Bank/EU/Massey University Project in advocating and promoting One Health through Master's course, creation of One Health hub and implementation of the collaborative investigation project in SAARC countries. She stressed that specific plan of action will be required for each countries for capacity building and operationalizing One Health. She shared the information about the OH symposium organized by the Massey University in Delhi and expressed interest to work together with FAO, OIE and WHO to strengthen OH activities at regional and country levels.

Dr Sudarat Damrongwatanpokin from ***USAID Bangkok*** clarified the USAID project was collaborating OH activities in Asia-Pacific region. She highlighted that most of the countries mainly focussed on avian influenza (H5N1) since 2005 in animal and human health sectors. She stressed the capacity building for laboratory and education for future development and indicated the OH university network and pilot projects for OH curriculum development for South East Asia and Africa. She informed that there will be OH conference in 2014 to bring together academics, government organizations, NGOs and other stakeholders to discuss collaboration for OH. She also acknowledged that EID strategies were developed

in many counties and anticipated that would maximize the benefit with the limited funding. She also suggested the requirement of commitments by government and advocacy to convince policy makers in governments.

Dr Joanna Tuckwell from the **World Society for the Protection of Animals (WSPA)** appreciated the collaboration among the partners, including WHO, FAO and OIE. WSPA acknowledged the tripartite group for inviting to the meeting and identifying the partnership activities to support SAARC rabies elimination initiative and wildlife programme of the Government of Vietnam.

Dr Allen John from **AusAID** emphasised on the activities at the grass-root level for One Health. He highlighted the joint educational courses, harmonize diagnostic facilities and sharing the laboratory result between wildlife, animal and human health sectors as a part of One Health.

On behalf of tripartite group, Dr Subhash Morzaria from FAO acknowledged the donor, partners and participants for identifying gaps and constraint in implementing One Health approach and for sharing the vision for future planning. He also welcomed the interests, initiative and suggestion of partner organizations for operationalization of One Health at regional and country levels for further strengthening collaboration and coordination at the human-animal-ecosystem interfaces.

Session 7: Way forward, conclusion and recommendations

Considering that:

The year 2013 was significant because of the emergence of novel infectious diseases such as avian influenza (H7N9) and Middle East Respiratory Syndrome Corona Virus (MERS-CoV) and increasing outbreaks of HPAI (H5N1).

Given the fact that the origin of most existing as well as emerging zoonotic diseases is from wildlife and domestic animals, it is necessary to enhance collaboration across human health, animal health and wildlife sector for the control and prevention of zoonoses.

FAO, OIE and WHO have established a functional coordination mechanism at regional level to support prevention and control of zoonoses which was useful for example for better coordination during avian influenza (H7N9) outbreak. The three organizations are working together to implement a number of initiatives designed to strengthen country capacities for risk reduction, surveillance and response to zoonotic events using existing systems and strategies such as the WHO Asia Pacific Strategy for Emerging Diseases (APSED) and FAO/OIE Global Framework for Progressive Control of Trans-boundary Animal Diseases (GF-TADS).

Measurable progress has been made towards operationalization of One Health in number countries as per recommendations of the Third Regional Workshop on Multi-Sectoral Collaboration on Zoonoses Prevention and Control held in Bali (Indonesia) from 26-28 November 2012. Success stories and good practices were shared by participating countries through poster presentation and panel discussion.

Multi-disciplinary inputs such as socioeconomics, communication, ecology and wildlife dimensions are essential in addressing zoonoses as part of One Health approaches.

There is increasing epidemiological evidence that live bird markets play an important part in maintaining, amplifying and disseminating influenza A viruses such as highly pathogenic avian influenza H5N1 and the novel H7N9, and as source of potential exposure of humans to avian influenza viruses.

Rabies is a priority zoonotic disease in most participating countries and there is a need of a regionally coordinated rabies elimination programme. Rabies elimination may serve as a model for operationalization of 'One Health' in rabies endemic countries of the Asia- Pacific region.

Many endemic zoonotic diseases affecting poor, marginalized, rural population have been neglected and many partner organizations are coming together with innovative approaches to control endemic and neglected zoonoses.

Increasing level of antimicrobial resistance is and will continue to results in severe impact on human health. Therefore, there is a need for greater attention on the prudent use of antimicrobial agents in both humans and animals.

The workshop recommends Countries and Regional and International Organizations:

- strengthen and consolidate ongoing national efforts to develop functional and sustainable national mechanisms for routine cross-sectoral collaboration on health issues at the human-animal-ecosystems interface based on existing country-level institutions and mechanisms.
- further enhance national and subnational mechanisms for information sharing, analyses where appropriate, communication, joint risk assessment and response.
- give greater consideration to the implementation of One Health initiatives at national and local levels by seeking political support and fostering partnerships with a wide range of stakeholders.
- consider socioeconomic impacts of zoonoses including cost-benefit analysis of prevention and control measures to better inform policy makers and target resources.
- enhance surveillance of influenza A virus at live bird markets for early detection and implementation of the risk mitigation measures to significantly reduce exposure to avian influenza viruses.
- prioritize risk reduction interventions for avian influenza infection both in animal and human at live bird markets and to develop joint implementation strategies based on animal-human-ecosystems interface.
- Develop and/or implement a comprehensive national strategy for rabies elimination based on mass dog vaccination and dog population management through international partnerships.
- advocate for and support development of multi-sectoral national action plans for the prevention of antimicrobial resistance development in humans and animals in line with international standards and guidelines.
- support countries in developing and operationalizing common or aligned communication guidelines and approaches considering existing strategies for prevention and control of zoonoses.
- support countries to develop standard tools and guidance for conducting joint risk assessment, outbreak investigation and risk communication for zoonotic events at the human-animal-ecosystems interface.
- promote active involvement of wildlife authorities and experts in One Health activities.

It is agreed that the next workshop would be organized by FAO in collaboration with OIE and WHO, focusing upon evaluating the effectiveness/efficiencies of the previous workshops, lessons learned and developing a future regional action plan.

Participants expressed sincere thanks to organizers for hosting a mega event by bringing together multidisciplinary groups, academics and partners to discuss multisectoral collaboration and partnership for the prevention and control of zoonoses. They acknowledged that this workshop was technically enriched, sessions were well structured and of common interest and concern, and scientific presentations were enlightening. Participant remarked that this meeting highlighted the various issues, take home messages, excellent analysis of the regional situation through country participation in poster presentation, panel discussion. In addition, the resource materials provided in pen drive and the visibilities of donor supports were also fully appreciated by the participants.

**Asia-Pacific Workshop on Multisectoral Collaboration for the
Prevention and Control of Zoonoses
Kathmandu, Nepal**

PROGRAMME

| Wednesday, 27 November 2013 | |
|---|--|
| 0830–0900hrs | Registration |
| Session 1: Opening | |
| 0900–0930hrs | <p>Inaugural session</p> <p>Welcome and Opening of the workshop</p> <p>Welcome remarks</p> <ul style="list-style-type: none"> • Dr Lin Aung, WHO Representative to Nepal [<i>On behalf of the Regional Director, SEARO</i>] • Dr Somsak Pipoppinyo, FAO Representative to Nepal • Dr Hirofumi Kugita, Regional Representative for Asia and the Pacific, OIE <p>Inaugural address:</p> <ul style="list-style-type: none"> • Dr Praveen Mishra, Secretary, Ministry of Health and Population, Nepal • Mr Jaya Mukund Khanal, Secretary, Ministry of Agricultural Development, Nepal <p>Introduction of Participants by Dr Dubravka Selenic Minet</p> <p>Nomination of Chairpersons & Rapporteurs</p> <p>Objectives of the workshop by Dr Gyanendra Gongal</p> <p>Vote of Thanks by Dr Nihal Singh</p> <p>Administrative announcements by Dr Gyanendra Gongal</p> <p>Group Photograph</p> |
| 0930–1000hrs | <i>Tea/Coffee break</i> |
| <p>Chairperson: Dr Huma Qureshi (Pakistan)</p> <p>Co-chairperson: Dr Sithong Phiphakhavong (Lao PDR)</p> <p>Rapporteur: Dr Pasang Tshering (FAO)</p> | |
| Session 2: Update on Regional Disease Situation | |
| 1000–1015hrs | Review of recommendations by Dr Ronel Abila, OIE |
| 1015–1045hrs | <p>Regional updates on zoonoses:</p> <p>Human Health – Dr Frank Konings, WHO</p> <p>Animal Health – Dr Wantanee Kalpravidh, FAO</p> <p style="text-align: center;">Dr Tikiri P. Wijayathilaka, OIE</p> |
| 1045–1100hrs | Q & A |

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| 1100–1200hrs | Scientific updates on key emerging diseases of international concern: - Zoonotic influenza – <i>Prof. H. Kida</i> - Novel coronavirus – <i>Dr Mumford</i> |
| 1200–1230hrs | Q & A |
| 1230–1330hrs | <i>Lunch</i> |
| Session 3: Updates on facilitating ‘One Health’ coordination at regional country levels | |
| 1330–1530hrs | Poster session - Progress in operationalizing ‘One Health’ at country level pertaining to zoonoses prevention and control – <i>Dr Wantanee Kalpravidh, FAO</i> |
| 1530–1600hrs | <i>Tea/Coffee break</i> |
| Session 4: Strategic update for rabies and AMR in the Asia Pacific Region | |
| 1600–1700hrs | Updates on tripartite activities related to rabies and AMR at regional level (<i>to brief on recommendations of international meetings/workshops on multi-disciplinary action</i>) moderated by Dr James Gardner Murray, OIE - Dr Gyanendra Gongal, WHO - Dr Katinka DeBalogh, FAO - Dr Mary Joy Gordoncillo, OIE |
| 1800hrs | Welcome Reception |
| Thursday, 28 November 2013 | |
| Chairperson: Prof. Be-Nazir Ahmed (Bangladesh) | |
| Co-chairperson: Dr Sithong Phiphakhavong (Lao PDR) | |
| Rapporteur: Dr Prakash Ghimire (WHO) | |
| 0830–0845hrs | Recap of day 1 by Dr Pasang Tshering |
| Session 5: Application of One Health Strategy to Specific Zoonotic Diseases | |
| 0845–0930hrs | Overview of avian influenza A(H5N1) in country - Dr Yuni Yupiana, Indonesia - Dr Bodh Nath Adhikari, Nepal - Dr LY Sovann, Cambodia |
| 0930–1000hrs | Overview of H7N9 event in China – Dr Zijian Feng and Dr Zhang Yito, People’s Republic of China |
| 1000–1020hrs | Q & A |
| 1020–1045hrs | <i>Tea/Coffee break</i> |
| 1045–1200hrs | Panel discussion on finding gaps among countries and challenges in developing the coordination mechanisms moderated by Dr Subhash Morzaria, FAO Panel members: Dr Rajendra Bambal – India |

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| | Dr Sinurtina Sihombing - Indonesia Dr Kazuko Fukushima - Japan Dr Dolgorkhand Adiyadorj - Mongolia Dr Wirongrong Hoonsuwan - Thailand Dr Rizza Araceli Salinas - Philippines |
| 1200–1330hrs | <i>Lunch</i> |
| 1330–1515hrs | Breakout session Introduction to breakout session Group work; multisectoral collaboration for Live Bird Market management (LBM) <ul style="list-style-type: none"> - Joint risk assessment at LBM - Surveillance and monitoring at LBM - Options for risk reduction measures at LBM |
| 1515–1545hrs | <i>Tea/Coffee break</i> |
| 1545–1730hrs | Parallel sessions <ul style="list-style-type: none"> • Wildlife – Dr James Gardner Murray, OIE • Socioeconomic dimension of zoonoses – Dr Wantanee Kalpravidh, FAO • Communication – Dr Prakash Ghimire, WHO |
| Friday, 29 November 2013 | |
| Chairperson: Mr Ibrahim Zuhuree (SAARC Secretariat) | |
| Co-chairperson: Dr Ken Cokanasiga (Secretariat of Pacific Countries) | |
| Rapporteur: Dr Tikiri P. Wijayathilaka (OIE) | |
| 0830–0845hrs | Recap of day 2 |
| 0830–0945hrs | Presentation and discussion on Neglected Zoonoses <ul style="list-style-type: none"> - Dr Gyanendra Gongal, WHO - Dr Katinka DeBalogh, FAO Updates on neglected zoonoses and its prevention and control <ul style="list-style-type: none"> - Dr Peetambar Kushwaha, GALVMED |
| Session 6: Application of One Health approach | |
| 0945–1005hrs | Overview of progress on application of One Health approach – Dr Susan Corning OIE |
| 1005–1045hrs | Re-visit the conclusion of each of the sessions (poster presentation, panel discussion and group work) – Dr Wantanee Kalpravidh, FAO <ul style="list-style-type: none"> - What type of actions are on-going as One Health approach (not disease specific, but general) - What is the way forward in each country |
| 1045–1100hrs | <i>Tea/Coffee break</i> |
| 1100–1200hrs | Panel discussion on vision for One Health at regional level moderated by Dr |

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| | Subhash Morzaria, FAO Topics for discussion include: <ul style="list-style-type: none">- progress- views from development partners |
| 1200–1230hrs | Q & A |
| 1230–1330hrs | <i>Lunch</i> |
| Session 7: Way forward, conclusion and recommendations | |
| 1330–1430hrs | Discussion on recommendations |
| 1430–1500hrs | Conclusions and adoption of recommendations |
| 1500–1530hrs | Closing remarks |
| 1530–1700hrs | Meeting of FAO/ OIE/ WHO Group |

**Asia-Pacific Workshop on Multisectoral Collaboration for the
Prevention and Control of Zoonoses
Kathmandu, Nepal, from 27 to 29 November 2013**

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