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REGIONAL WORKSHOP ON THE INTERLINKAGES BETWEEN HUMAN HEALTH AND BIODIVERSITY FOR EUROPE

Helsinki, 23-26 October 2017

REPORT OF THE REGIONAL WORKSHOP ON THE INTERLINKAGES BETWEEN HUMAN HEALTH AND BIODIVERSITY FOR THE EUROPEAN REGION

I. BACKGROUND/INTRODUCTION

1. In decision XII/21, the Conference of the Parties welcomed the outcomes of regional capacity-building workshops on biodiversity and human health held for the regions of Africa and the Americas, co-convened by the Executive Secretary and the World Health Organization. In the same decision and in decision XIII/6, the Conference of the Parties requested the Executive Secretary convene regional capacity-building workshops on biodiversity and health in additional regions.

2. Accordingly, the CBD Secretariat and WHO, with financial contributions from the Government of Finland and the European Union, have co-convened a regional workshop for the European region to address issues relevant to biodiversity and human health. The regional workshop for the European region was co-hosted by the CBD Secretariat, WHO and the Government of Finland, with technical input and support from the WHO Regional Office for Europe (WHO/EURO) through the European Centre for Environment and Health, in Helsinki, from Monday 23 October to Wednesday 25 October 2017.

3. The workshop was attended by government-nominated officials representing ministries of health, as well as representatives nominated by the CBD Focal Points from the following countries: Armenia, Austria, Azerbaijan, Belgium, Estonia, Finland, France, Georgia, Germany, Hungary, Israel, Italy, Kyrgyz Republic, Moldova, Monaco, Montenegro, Norway, Serbia, Slovak Republic, Slovenia, Sweden, Switzerland, Tajikistan, The Netherlands, Turkey, and Ukraine, as well as the European Commission (DG Environment). A representative from the Saami community in Norway was also invited but was unable to attend due to illness.

4. Representatives from the COP 13 Presidency (Mexico) and incoming COP 14 Presidency (Egypt) also attended. Various resource persons from countries in the region, as well as the European Centre for Disease Control and from other international organizations, including Future Earth, IUCN, Rockefeller Foundation-Lancet Commission on Planetary Health, TRAFFIC International, UNISDR and UNDP, also contributed their expertise to support mainstreaming biodiversity and health linkages, local implementation, stakeholders engagement, and work with other Conventions. Core thematic areas at the intersection of biodiversity and human health addressed in the workshop included, among others: the human microbiome and microbial diversity in the environment, food security and nutrition, zoonotic and vector-borne diseases, One Health, biocultural diversity and mental health, health in urban environments, climate change and disaster risk reduction. In total, official representatives from 28 countries attended. With the inclusion of resource persons, participants from over 32 countries contributed to the meeting. The list of participants for the workshop is presented on the workshop website <https://www.cbd.int/health/european/default.shtml>.

5. The Conference of the Parties to the Convention on Biological Diversity (CBD) had requested the Executive Secretary of the Convention on Biological Diversity to further strengthen collaboration with

the World Health Organization (WHO), as well as other relevant organizations and initiatives, to promote the mainstreaming of biodiversity issues in health programmes and plans and to investigate how implementation of the Strategic Plan for Biodiversity 2011-2020 can best support efforts to address global health issues, including avenues for bridging gaps between work on the impacts of climate change on public health and the impacts of climate change on biodiversity (decision X/20, para. 17). Biodiversity mainstreaming in the health sector was identified as a new mainstreaming priority at the thirteenth meeting of the Conference of the Parties (COP) in decision XIII/3.

II. WORKSHOP OBJECTIVES AND EXPECTED OUTCOMES

6. The general objective of the workshop was to provide a forum for national representatives of the health and counterpart environment/biodiversity communities in the European region on integrated actions to be taken in their respective countries while advancing the objectives set out in their national biodiversity strategies and action plans, national health strategies and other relevant policies, plans and projects, as a contribution to the implementation of the Convention, the Strategic Plan for Biodiversity 2011-2020, the objectives of the WHO, the Sustainable Development Goals (SDGs) and other global commitments. It also sought to build capacity to integrate information on the ecosystems services upon which health, livelihoods and well-being depend.

7. The specific objectives of the workshop were to:

(a) Support mainstreaming of biodiversity-health linkages, in line with the findings of the State of Knowledge Review, *Connecting Global Priorities: Biodiversity and Human Health* into the environment and public health policies, plans and projects;

(b) Acquaint all participants with the CBD and WHO processes, as well as implementation frameworks including the Strategic Plan for Biodiversity 2011-2020, in particular as they relate to health issues;

(c) Strengthen national capacities on biodiversity and human health interlinkages;

(d) Provide a forum for the exchange of best practices and lessons learned for the integration of biodiversity and health linkages in the WHO European region;

(e) Identify capacity needs and/or opportunities for the implementation of the Strategic Plan 2011-2020, the Sustainable Development Goals and related public health processes in the European region;

(f) Promote the integration of human health and biodiversity linkages, and integrated approaches, into national health strategies and national biodiversity strategies and action plans (NBSAPs), in national health strategies and other relevant national reporting instruments;

(g) Assist Parties in understanding the linkages between biodiversity and human health with a view to reviewing, updating, revising and implementing NBSAPs and national health strategies, with consideration for how they can serve as effective tools for mainstreaming biodiversity and human health into other national, regional and global policies.

8. The workshop format featured high-level keynote presentations from both sectors, and a vast array of expert presentations followed by question and answer sessions, presentations by country representatives, discussions in smaller working groups, interactive sessions, a guided health walk as well as an optional field visit at the end of the workshop.

9. The present report provides an overview of the workshop agenda sessions, presentations, and conclusions from break-out sessions, including examples of next steps going forward. Annexes to this report present more detailed information about the workshop, including the analysis of needs identified by

country representatives (Annex 1) and the outcomes of break-out sessions (annex II). The full workshop programme is presented in *Appendix I*.

III. SUMMARY OF PROCEEDINGS

ITEM 1. OPENING OF THE WORKSHOP

10. The workshop was opened on Monday, 23 October 2017 at 9 a.m. by H.E Mr. Kimmo Tiilikainen, Minister of the Environment, Energy and Housing, Finland. He noted that The Finnish Strategy and Action plan for the Conservation and Sustainable use of Biodiversity aims to safeguard biodiversity for the needs of future generations and promotes ecologically, economically, culturally and socially sustainable development by jointly supporting the natural environment and human well-being. H.E. Minister Tiilikainen emphasized the need to strengthen awareness and implementation of the Convention and WHO, acknowledging with interest the agenda for the workshop and its five primary thematic areas. He noted that the Finnish Strategy and Action plan for the Conservation and Sustainable use of Biodiversity by 2020 aimed to safeguard biodiversity for the needs of future generations by promoting ecologically, economically, culturally and socially sustainable development in a comprehensive manner by ensuring that the state of the natural environment in Finland was stable and capable of ensuring people's health and well-being. However, pressures on nature and human health were intensifying, like increased allergies, the well-known risks of chemicals, the continued spread of invasive species, and climate change, exacerbating these pressures.

11. More than half of the population living in urban areas in Europe suffered from noise pollution, though only 15% of the population in Finland was exposed to levels of noise exceeding 55 decibels. People suffering from noise and other stresses could find positive health effects from nature, including protected areas, and other natural areas; more than 70 % of the Finnish surface area was covered by forests and 10% of fresh water. Large natural areas could muffle noise while also improving air quality by removing dust and other impurities and by binding ozone and monoxide gases. Natural areas could also promote both physical and mental well-being including as a mental, cultural and experiential environment.

12. The Minister also emphasized the value of wild herbs, plants and animals, noting that northern wild berries had been observed to have numerous positive health effects. Due to Arctic growing conditions, they contained many bioactive compounds, such as vitamins and polyphenols. The anti-oxidizing efficiency of wild berries was well known, and there were many polyphenolic compounds with similar healthy characteristics. Game, edible mushrooms and berries from Finnish forests and wild fish from lakes had been utilized over centuries. Finland sponsored the "Nature for Health and Well-Being in Finland" Argumenta project¹ finalized in 2014, and the Ministry of the Environment would continue together with the Finnish Environment Institute (SYKE), Health and other Ministries, to make progress on Nature for Health and Well-Being by mainstreaming and enhancing national cooperation between governmental and other sectors.

13. H. E. Minister Tiilikainen emphasized that the work on the awareness of interlinkages between health and biodiversity needed to continue and be integrated in the post 2020 version of the Finnish National Biodiversity Strategy and Action Plan (NBSAP). He welcomed the attendance of the representative of the current presidency of the COP, H.E Ambassador of Mexico to Finland, the representatives of the Ministry of Environment and Ministry of Health of Egypt, and all participants from the European region. In closing he noted that he was pleased the pupils from Vuosaari college were

¹ Reference: Jäppinen, J.-P., Tyrväinen, L., Reinikainen, M. & Ojala, A. (eds.) 2014. Luonto lähelle ja terveydeksi. Ekosysteemipalvelut ja ihmisen terveys Argumenta-hankkeen (2013–2014) tulokset ja toimenpidesuosituksset. (Nature for Health and Well-Being in Finland – results and recommendations from the Argumenta project Ecosystem Services and Human Health (2013-2014). Suomen ympäristökeskuksen raportteja (Reports of the Finnish Environment Institute) 35/2014. 104 s. Helsinki. <https://helda.helsinki.fi/handle/10138/153461>

participating in the workshop and providing logistical assistance and wished all participants a fruitful workshop.

14. Dr. Tedros Adhanom Ghebreyesus, Director General of WHO then delivered a keynote statement to participants via videoconference. He noted that biodiversity loss and climate-sensitive risk factors and illnesses contributed greatly to the global burden of disease, acknowledging the urgency that we not only adapt to these changes, but mitigate them; and he welcomed WHO collaboration with the Secretariat for the CBD, and other partners, to address these challenges. The resultant knowledge had to be built into national plans, noting that our conversations around health, biodiversity and climate change could not stop with us. It required the involvement of every sector of every government.

15. Ms. von Weissenberg, of the Ministry of Environment, Finland welcomed the message of the WHO keynote statement and introduced other high level speakers in the morning panel, welcoming H.E. Ernesto Céspedes, Ambassador of Mexico to Finland and the representative of the existing COP President to the Convention highlighted the fact that the primary theme of the thirteenth meeting of the Conference of the Parties to the CBD was “Mainstreaming biodiversity for well-being”, with emphasis on agriculture, forestry, fisheries, and tourism. During the High-Level Segment in Cancun, ministers of these four sectors participated and adopted the Cancun Declaration on Mainstreaming the Conservation and Sustainable Use of Biodiversity for Well-being. Decision XIII/3, which comprised the integration of actions for the conservation and sustainable use of biodiversity in the daily activities of the productive sectors, extended this mandate to four new sectors including health. Decision XIII/6 strengthened national commitments under the joint work programme on biodiversity and health between CBD and WHO.

16. H.E Ambassador Céspedes noted that Mexico, in its capacity as President of the Conference for the 2017-2018 biennial, promoted mainstreaming of biodiversity as an essential tool to achieve the Strategic Plan for Biodiversity and its Aichi Targets; the 2030 Agenda and its SDGs. He further emphasized that in addition to playing a decisive role in human nutrition, through its influence on world food production, biodiversity also provided the basis for the development of traditional and modern medicines; played an important role in the regulation and control of infectious diseases, was essential for adapting to climate change, and had significant social and cultural value. To support this work, Mexico was actively working on strengthening alliances and developing mainstreaming strategies that enabled the conservation and sustainable use of biodiversity in productive processes. Mexico was also actively participating in the preparation of the United Nations Environment Assembly (UNEA-3) to be held in Nairobi in December 2017 and had presented a draft resolution on “Pollution Mitigation by Mainstreaming Biodiversity into Key Sectors”. Likewise, the European Union would present a draft resolution on “Environment and Health” and both deserve support. The Ambassador also noted that as Egypt would host the fourteenth meeting of the Conference of the Parties in November 2018, Mexico and Egypt were collaborating to support the mainstreaming agenda. He also remarked the importance of this regional workshop to the upcoming deliberations of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) and the Subsidiary Body for Implementation (SBI), which would deliver draft decisions for the fourteenth meeting of the Conference of the Parties in Egypt.

17. Mr. David Cooper, Deputy Executive Secretary at the CBD Secretariat thanked H.E. Ambassador Céspedes for an inspiring statement, and expressed special thanks to H. E. Minister Tiilikainen and other representatives of the host Government for their remarkable support in the preparation of this regional workshop and delivered a statement on behalf of the Executive Secretary of the CBD Secretariat. He noted that this was the third in a series of regional workshops organized to mainstream biodiversity and health interlinkages across sectors, and that the deliberations during the workshop could help to identify opportunities for a more holistic approach by both sectors to promote human health and biodiversity, and serve as a model for other regions in Europe and beyond.

18. The opening plenary of the workshop was facilitated by Ms. Marina von Weissenberg and Mr. David Cooper. Following his opening remarks, Mr. Cooper facilitated self-introductions among the participants.

ITEM 2. OVERVIEW OF BIODIVERSITY AND HEALTH LINKAGES AND MAINSTREAMING

19. Ms. Cristina Romanelli, WHO-CBD liaison on biodiversity and health, spoke on behalf of the CBD-WHO joint work programme and health. Ms. Romanelli began by introducing the Convention, its objectives, and the role and relevance of mainstreaming biodiversity and health linkages. She provided an overview of the history of collaboration under the joint work programme and related COP mandates on biodiversity and health. She also introduced some of the linkages between biodiversity and health, in line with the findings of the *State of Knowledge Review*, emphasizing the relationship between biodiversity and health in relation to food security and nutrition, disease regulation, physical, cultural and mental well-being as well as climate-change adaptation. Anthropogenic pressures have led to an overall decline in biodiversity and several ecosystem services essential to human health and well-being, thus the urgency of mainstreaming and the need for coherent, cross-sectoral action to achieve the objectives of sustainable development. Ms. Romanelli noted that, while progress was being made, it was clearly insufficient for most relevant Aichi Targets, and there was movement away from the common objective of Aichi Target 14. Ms. Romanelli briefly presented some elements of decision XIII/6, the most recent mandate by Conference of the Parties, noting that key aims of the workshop were to facilitate cross-sectoral dialogue and to identify mechanisms and best practices to support implementation.

20. Professor Andy Haines, Chair of The Rockefeller Foundation-Lancet Commission on Planetary Health, joining via videoconference, introduced some of the key findings of the planetary health report. Although considerable health gains had been achieved over the past five decades, these would be reversed in the absence of concerted cross-sectoral action and research. For example, he noted that while the share of the global population living in extreme poverty declined dramatically those gains were at risk of being reversed as a result of anthropogenic activity driving global environmental changes including biodiversity loss. The sense of urgency for concerted action was emphasized, noting that we were on the cusp of a reversal in process. He drew the attention of participants to several scientific studies and discussed numerous examples (e.g. unsustainable agriculture, malnutrition, food waste, pollution, forest fires, etc.) of ways in which anthropogenic activity was exacerbating global environmental change, including biodiversity loss, with correspondingly negative impacts on human health. He also addressed key challenges and potential solutions in which different sectors could come together to jointly maximize human health and planetary health.

21. Mr. Mathias Braubach of the European Centre for Environment and Health, WHO Regional Office for Europe, delivered a presentation on environment and health work in the WHO European Region, discussing the relevance of biodiversity to human health across a number of thematic areas. The focus of the WHO regional office for Europe notably addressed the areas of urban green spaces and urban green spaces and climate change. Political frameworks for WHO/Euro include work on green space and health including the Parma Declaration, the SDG agenda and the New Urban Agenda. Green spaces benefit cities and urban quality of life through their ability to deliver positive environmental, social and health outcomes; upgrade the social and environmental quality of disadvantaged and deprived areas; and enhance local resilience and promote sustainable lifestyles. Two recent publications on urban green spaces and health included a review of the evidence on urban green space and a WHO brief for action was launched earlier this year at the European Conference on Biodiversity and Health in the Context of Climate Change, held in Bonn in June 2017.

22. Mr. Braubach also highlighted impacts of climate change and other global environmental changes on health. Over recent decades, many plant and animal species had shifted their geographical ranges, altered their abundance and shifted their seasonal activities in response to observed climate change (e.g. bird migration or pollen production), and these shifts may increase the incidence of pollen allergies and vector-borne diseases in the European Region. On average, 77 000 Europeans fell sick from vector-borne diseases every year. The European Environment and Health Process (EHP) at WHO was an institutional framework that ensures appropriate coordination between national implementation and international policies, and the proper level of monitoring and implementation.

23. The afternoon session of the first day was facilitated by Ms. Lina Mahy and the second and third days of the Workshop were facilitated by Ms. Cristina Romanelli and Ms. Marina Maiero.

ITEM 3. ADVANCING CO-BENEFITS BETWEEN HEALTH AND BIODIVERSITY AND MOVING TOWARDS COLLABORATIVE BEST PRACTICES

24. This item was carried out over two days, including six expert presentations the first day of the workshop covering each of the core thematic areas addressed throughout the workshop. Speakers were introduced by Ms. Marina von Weissenberg who also facilitated the discussion for this agenda item. A complementary keynote presentation, on communicable disease in Europe, was also delivered by Dr. Jonathan Suk of the European Centre for Disease Control on the third day of the workshop.²

25. The initial presentation under this item, on the human microbiome and the benefits of exposure to microbial diversity in the environment, was delivered by Ms. Eeva Furman of the Finnish Environment Institute (SYKE) described people's symbiotic relationship with microbial diversity, and introduced the "biodiversity hypothesis" suggesting that a rich microbiota leads to a healthy commensal microbiota and promotes immunological tolerance. Decreased exposure to green environments leads to microbial deprivation, associated with health problems ranging from allergies and asthma, to chronic intestinal illnesses, metabolic syndrome, cardiovascular diseases, neurological illnesses as well as diabetes, obesity, cancer, and mental disorders.

26. Conversely, balanced, rich microbiota has self-regulating functions and supports human health outcomes, as the majority of microbes perform beneficial functions. Immunological tolerance and contact with rich biodiversity is especially critical for child and maternal health, but microbial exposure is important at all ages. She also noted that inflammatory diseases have high personal and societal costs. In Finland, asthma and allergies alone cost between 1.3 and 1.6 billion Euros annually (based on 2014 estimates); prevention of inflammatory diseases requires adequate management of societal structures (e.g. green and blue infrastructure; air, water and soil quality; food policy, housing, etc.); a green economy (small-scale local farming, etc.) and lifestyle and behavior. Nature-based solutions can enhance daily exposure to nature and should be considered in urban planning through more holistic, cross-sectoral, approaches that actively promote green infrastructure and support health outcomes. She emphasized that contact with nature does not only imply green infrastructure, but also refers to lifestyles and how actively people connect with nature.

27. Ms. Furman also noted that the microbiota, though not explicitly referenced as such, is linked with each one of the SDGs, cutting across all of them. To conclude, she presented the Finnish "Nature Step" programme strengthens citizens' mobility and, healthy diets and controlling costs associated with noncommunicable diseases (NCDs) through exposure to nature. She invited others to consider developing a programme of this kind, which would also contribute to the implementation of their various global sustainability commitments. Her final key message was that access to nature is important but so is increasing people's understanding of the interconnection between the use of green infrastructure, their access to it and behaviour to support active contact with nature.

28. Mr. Graham Rook, of University College London, delivered a presentation on the human microbiome, with a focus on the evolutionary background to the relationship between environment, microorganisms and human health, presenting several recent findings in this area.

29. Mr. Rook noted that the microbial cells in our bodies carry out functions as significant to health and physiology as organs such as liver or kidneys. He discussed the evolution of the adaptive immune system over time noting its function of managing the microbiota while simultaneously keeping out pathogens. In areas where there was reduced human contact with microbes in the environment there are

² All workshop presentations are available from: <https://www.cbd.int/health/european/default.shtml>.

many people with permanently raised levels of background inflammation which contributes to cardiovascular and metabolic disease as well as depression.

30. System failures in high-income urban settings have distorted the microbiota leading to metabolic dysregulation (e.g. diabetes), and chronic inflammation, which contribute to rises in NCDs associated with distorted and usually less biodiverse microbiota in the gut and to increased exposure to antibiotics. Mr. Rook presented several recent scientific findings showing not only that microbiota have an impact on allergies, autoimmunity and inflammatory diseases but also affect obesity and mood disorders. Research findings may be considered particularly alarming if we consider that a very high proportion (approximately 50%) of microbiota has been lost over time, most notably in highly urbanized environments. Studies have shown that exposure to traditional farming methods and close contact with animals, plants and soil, can not only lead to fewer allergic disorders in children but have decreased expression of markers of inflammation in their peripheral blood.

31. A very recent study published in PLoS One by Hallmann and colleagues shows that, on a logarithmic scale, over the past 27 years, 80% of flying insect biomass has been lost in Germany. This is alarming because it is not found to be attributable to changes in the climate or vegetation which may suggest that it is closely linked with agricultural practices such as exposure to chemicals, pesticides, antibiotics, and industrial pollution. Antibiotics upset the microbiota of bees, with negative effects on immunity and susceptibility to other infections. Unsustainable agriculture not only contributes to reduced crop health and yields but also reduces input to human immune systems and to human microbiota.

32. The second part of the thematic panel addressed food security and nutrition. Ms. Lina Mahy of the Nutrition Department at the WHO delivered a presentation of that theme. She emphasized that losing biodiversity means losing the option of making our diets healthier and our food systems more resilient and sustainable. Unhealthy diet is now the number one risk factor for the global burden of disease. Worldwide, 1.9 billion adults are overweight, over 600 million were obese, and 42 million children under the age of 5 are obese. At the same time, an estimated 462 million adults are underweight, 264 million women are affected by iron deficiency, 50 million children are underweight and 156 million children were stunted.

33. Ms. Mahy also highlighted the loss of genetic diversity in our diets over time, associated dietary shifts, and the rise in the caloric share of ultra-processed products in national food baskets and food waste. For example, in 2008, over 63% of the national food basket in the UK was comprised of ultra-processed foods. She also provided an overview of international commitments, including the adoption of six global nutrition targets by the World Health Assembly, the WHO Global Monitoring framework for NCDs, the Rome Declaration on Nutrition and its Framework For Action (FFA) and the Decade of Action on Nutrition 2016-2025, including a new reporting obligation every 2 years. The Decade of Action also creates a timely opportunity to work together across multiple sectors to translate the commitments of Second International Conference on Nutrition (ICN-2) into tangible action and implementation for all countries. The Decade of Action on Nutrition can also contribute to the mandate and objectives of the UN Decade on Biodiversity by promoting commitments and action networks in food systems. WHO additionally just completed a new Strategic Vision for Nutrition which mission explicitly refers to sustainable diets. There are 6 priorities and they are reaching out to other sectors. This also provides an opportunity for CBD to better align its own work with this work led by the health sector.

34. Key messages from Ms. Mahy's presentation include: (a) Malnutrition in all its forms affects all countries; (b) Industrial agriculture and current food systems are broken and impact the environment, including biodiversity; (c) Biodiversity is needed to ensure healthy and diverse diets; (d) Nutrition and biodiversity communities need to collaborate as it is a natural win-win (e) the Nutrition Decade provides opportunities for countries to make SMART commitments (e.g. Brazil has adopted comprehensive food-based dietary guidelines incorporating the importance of local foods, supporting traditional food cultures and sustainable food procurement) or lead an action network (e.g. Norway has established a Network for Sustainable Fisheries).

35. Mr. Richard Koch, of the Royal Veterinary College, UK, delivered a presentation on vector-borne diseases, zoonoses and One Health. He emphasized the importance of cross-sectoral dialogue, emphasizing the importance of narrative. The rhetoric over the past two decades on emerging infectious diseases had steered much of the general public narrative to the often misleading conclusion that wildlife transmit disease to humans. In reality, the number of infections directly attributable to wildlife were relatively minute; even diseases such as rabies, did not come from wildlife except in very rare cases, but primarily came from the domestic environment. A highly cited figure noted that 60% of emerging infectious diseases were zoonoses of which 71% had a wildlife origin, but this was not from direct infection. The root causes of disease were much more complex and rooted in ecological processes. Approximately three-quarters of emerging diseases in wildlife in fact had a domestic/livestock origin; spillover and pathogen jumping were key factors as pathogens adapted to new hosts. The process of adaptation across species was being driven by human activities and landscape alteration.

36. Disease are also driven through our economic system. For example, Hong Kong was at the centre of the Avian Influenza outbreak, exacerbated by foreign direct investments for poultry production. Thus the genetics of Avian influenza and the speed of change in that virus was directly linked to investment decisions leading to the intensification of poultry production. The same case could be made for human influenza. Commercially-driven fragmentation of forests was likely acting as a bridge for yellow fever outbreak in Brazil, and urbanization likely led to emergence of permanent endemic cycles of urban Dengue and Chikungunya Virus in Africa. Ebola virus was another example of a virus which was closely associated with the fragmentation and change in the structure of the environment (e.g. the building of roads; the introduction of palm oil plantations and other agricultural plantations). He emphasized the interconnectedness of these various processes and the need to examine them holistically in development because disease was driven through these structural changes.

37. The majority of the resources in public health (97%) at present were spent on emergency (treatment, culling, vaccination), and preventive medicine (hygiene measures, vaccination, diet). This technical approach failed to consider the long-term sustainability of these measures. Prevention required taking into account One Health, working across sectors, and investing in a balanced manner between biodiversity conservation and environmental management on the one hand, and people on the other.

38. Participants were then invited to contribute to discussion and ask questions. Elements of that discussion are reflected in the discussion section that follows.

39. Ms. Marina von Weissenberg of Finland facilitated the first part of afternoon plenary under agenda item 3.

40. Mr. Conor Kretsch of the COHAB Initiative addressed the theme of biocultural diversity and human well-being, examining links between nature, culture and the social & psychological dimensions of health, building on the mental health chapter of the State of Knowledge Review. He suggested that culture is increasingly seen as a fourth pillar of sustainable development, further encouraged by the 2030 Sustainable Development Agenda. Aspirational targets under the SDGs speak to the importance of supporting and appreciating cultural diversity, and ensuring participatory justice including universal access to healthy environments regardless of social or cultural identity, particularly for marginalized and vulnerable groups.

41. The cultural dimensions of health and well-being are increasingly important in European health care. A recent WHO report suggested “re-engaging public health with the full complexity of subjective, lived experience and opening the door to a more systematic engagement with the cultural contexts of health and well-being” as part of a more “people-centered, whole-of-society” approach to health policy, research and practice, demanding consideration of diverse biocultural connections. Key clinical cultural barriers occur when sociocultural differences between patient and provider are not fully accepted, explored or understood as patients may hold diverse socioculturally based health beliefs, reflecting different approaches to medical practice (e.g. home remedies or varying levels of trust in medical professionals) and sometimes divergent views on risks or benefits of exposure to the natural environment.

42. Biocultural dislocation included loss of access to community networks, separation of place and identity associated with local landscapes and biodiversity, loss of access to agrobiodiversity resources and separation from associated culinary and social traditions and from traditional approaches to healthcare. Studies had shown that dislocated communities retain strong reliance on traditional foods and traditional medicines. This can be an additional hardship for refugee and migrant communities, where opportunities to engage with nature were generally scarce.

43. Ms. Aletta Bonn of the Helmholtz Centre for Environmental Research, German Centre for Integrative Biodiversity Research (iDiv) noted the MEA underappreciated important links with cultural ecosystem services and the potential for socioeconomic mitigation. The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) focused on health and social well-being but health aspects were under-represented at the moment. WHO and CBD should have a special assessment on biodiversity and health, stressing the value of such an assessment under the CBD-WHO Joint Work Programme. The European Eklipse process was leading a meta-analysis study on the types and components of urban and peri-urban environments on mental health and well-being. The results would be released in 2018.

44. A conference coordinated by iDiv in June 2017, on biodiversity and health in the face of climate change was hosted by the Federal Agency of Conservation in Germany and the European Nature Conservation Agencies (ENCA). ³The WHO office for Europe also co-sponsored the event, and a series of recommendations were made at the conclusion of the workshop. The five main headlines of the ENCA recommendations included:

(a) The need to increase the evidence base of the contribution of biodiversity to health and well-being;

(b) Increase awareness of the health and well-being effects of biodiversity and natural environments;

(c) Highlight the co-benefits of nature-based solutions for climate change adaptation to policy-makers and regional planning authorities;

(d) Foster the application of nature-based solutions for climate change adaptation from society and policy;

(e) Effectively design and manage green spaces to ensure people have contact with biodiversity and nature.

45. For planners and other practitioners from the biodiversity and conservation sector, it was important to know how to effectively design and manage green spaces that promote contact with biodiversity and nature. While protected areas (which could be promoted as “health hubs”) were important, developing green spaces where people, including children, can interact regularly was vital. Urban gardens could be placed in many locations. A recent meta-analysis of 22 studies from across the US, Europe, Asia, China and Japan (Soga et al.) examined the effect of gardening on physical and mental health and found that gardens had public health benefits. “Walks for Health” in nature were becoming increasingly prominent across Europe and were also spreading to the US and the Netherlands and Germany.

46. Ms. Aletta Bonn also presented a recent study on dose response examining the relationship between nature and depression, anxiety and stress across three neighbourhoods in the UK. The study concluded that among five nature characteristics examined, vegetation cover and bird abundance were “positively associated with a lower prevalence of depression, anxiety, and stress”. In neighborhoods, where there was an increase of 20% in vegetation cover rates of depression and stress were decreased by

³ The ENCA recommendations were made available to participants during the workshop and can also be accessed at the workshop website at: <https://www.cbd.int/health/european/default.shtml>

17% and 11% respectively and with even higher vegetation cover, anxiety levels were also found to decrease by 25%. This was one of the first studies of its kind in which dose response was examined.

ITEM 3. DISCUSSION PANEL: ADVANCING CO-BENEFITS BETWEEN HEALTH AND BIODIVERSITY

47. Dynamic question and answer periods followed each set of presentations. Following the last thematic presentation under theme 3, all experts reconvened for a plenary panel discussion, facilitated by Ms. von Weissenberg. The following summarize some elements of the discussion.

48. It was made clear that health outcomes associated with microbial exposure in the environment were not systematically linked to income, urban versus rural settings or proximity to biodiverse spaces. They were also associated with lifestyles. Moreover, the quality of contact with the natural environment was identified as one of the key determinants of health outcomes in related studies on the higher incidence of allergic disorders among microbially-deprived populations. Some also pointed to scientific studies demonstrating associations between healthy microbiotas and rich plant-based diets. It was also noted that once the gut microbiome had been disrupted (e.g. child malnutrition) nourishing a child may not immediately solve the problem because a shift in the microbiota from one stable state to another was needed and took place over time. Consequently, malnutrition could have long-term effects on the microbiota.

49. Discussions also centered around systemic inequalities which may be perpetuated or attenuated by government policies, including perverse/positive market incentives and public procurement. The important role of agricultural policy not only in determining outcomes for biodiversity (e.g. pollinators) but also nutritional outcomes was emphasized.

50. Discussions also centered around the need for investment in prevention. It was emphasized that country representatives could play a key role in setting the global policy agenda to ensure that greater investments in the structural elements of One Health were prioritized, including at the international level. Challenges associated with shifting some of the investment and achieving integration were discussed. There was often a tendency to prioritize benefits to people above all else and a need to ensure the value of all disciplines are on more equal footing. The notion of resilience is relatively recent in public health discussions though it has long permeated the lexicon in conservation. Strengthening One Health, also meant a convergence of these values was required which could only be achieved by creating the enabling structures and bringing ecology, and the work of visionary thinkers such as Humboldt, Darwin, and others, back into the public health discourse. The notion of resilience may be a unifying concept.

51. In response to a question on the sufficiency of scientific evidence associated with the benefits of conservation in disease prevention, Mr. Koch noted that what was lacking was not the evidence itself but rather awareness and the right narrative.

52. The facilitator also asked panelists to suggest a key recommendation arising from their respective presentations, building on those already presented. The following elements arose from that discussion:

(a) Ministries of Health and Environment should liaise with the Finance and other relevant national Ministries to report what policies and practices have been implemented and how finances had been made available to support green infrastructure;

(b) Identify ways in which investment could be supported so as to move away from crisis management toward more preventative policies;

(c) Sectors had to learn to listen to each other and engage in open dialogue, through a far more holistic approach. This required adopting a nature-based approach in ways that considered the point of view of other sectors and by asking what biodiversity can do to support these needs;

(d) Understanding that biodiversity was perceived differently by different people and government Ministries. Facilitating open cross-sectoral dialogue and exchange and views on how to meet targets in respective Ministries;

(e) Research on microbiota has reached a point in which it has become obvious that it is absolutely fundamental to physiology and there are strong links with biodiversity. It is essential to support further research in this area;

(f) Participants considered it important to better integrate health considerations with biodiversity considerations and vice versa. From an economic perspective, it was worth assessing the cost of doing nothing and to identify nature-based solutions and other mechanisms so they may be promoted as cost effective solutions;

(g) The need for further cross-sectoral collaboration, including with different departments of WHO, such as nutrition and mental health had been emphasized as there was a clear link between biodiversity and multiple dimensions of health;

(h) Best practices, such as the Brazilian dietary guidelines, should be identified and disseminated because they brought together numerous elements discussed at this workshop. The example of the dietary guidelines in Brazil was identified as a good example because they did not only look at nutritional value but also at the value of traditional food cultures, traditional food systems and the relationship between food and cultural dimensions;

(i) It was further noted that biodiverse spaces could also provide a social purpose and social function. The function of biodiversity in supporting social well-being should also be acknowledged and widely communicated in addition to co-benefits;

(j) Measures should be understood as the management of socioecological systems and biodiversity can be better embedded in that management through urban planning;

(k) The co-benefits of implementing biodiversity conservation measures should also be acknowledged for their value to the mitigation and adaptation of climate change and disaster risk reduction. For example, forests, green spaces and parks may be acknowledged for their ability to provide shade in hot temperatures in addition to their ability to reduce air pollution, support mental health and physical activity, etc. This provides only one example of how the value of biodiversity and nature as an ecosystem service also supports measures to address the impacts of climate change;

(l) It was also noted that biodiversity and health co-benefits should be acknowledged for their contribution to intergenerational justice or other dimension of justice (e.g. climate justice);

(m) The importance of developing a narrative to raise awareness of key benefits of biodiversity and health mainstreaming and disseminating the value of nature in urbanized settings were also identified as important, as well as promoting a common understanding of terminology as biodiversity can be an abstract term that is poorly understood by many and awareness can be increased through education;

(n) The value of nature-based approaches and better communicating measures that promote health benefits of exposure to nature, such as Healthy Parks, Healthy People, are an important intervention and also a 'no-regrets' measure.

53. A country representative noted that examining dose response in countries such as Finland and using nature areas to initiate social intervention studies were valuable to supporting these measures.

54. It was further noted that in the development recommendations for urban planning, including in relation to dose response, it was important to avoid the implementation of overly simplistic solutions that did not necessarily protect biodiversity or maximize health outcomes. The issue of proximity and access to biodiverse green spaces in urban areas was also an important consideration to ensuring accessibility and maximizing co-benefits.

ITEM 4. INTERNATIONAL COOPERATION AND SUPPORT NETWORKS FOR HEALTH AND BIODIVERSITY MAINSTREAMING

55. Ms. Lina Mahy, of the WHO nutrition department, facilitated the second part of the afternoon session.

56. Dr. Kari Raivio, Chancellor Emeritus of the University of Helsinki and member of Engagement Committee of Future Earth, provided an overview of Future Earth, its history, complex structure and numerous institutional partners and members of which it was comprised. Its complex structure includes five global hubs, regional and country offices which had a potential to support implementation and capacity-building, Knowledge-Action Networks (“KANs”) including a Health KAN, and a Governing Council. He also noted that a key mechanism of information exchange under Future Earth was its Open Network.

57. Challenges associated with integrating health in the global sustainability and research agenda were highlighted. Among them, while SDG Target 3 addressed health there were no targets associated with global environmental change. Similarly, while SDG Target 13 called for global action on climate change, it did not have explicit health targets. However, awareness of health issues in the context of global environmental change had been increasing as a result of global initiatives (e.g. the Commission on Planetary Health, the CBD-WHO Joint Work Programme, chapter 3 of the IPCC report). Integrated surveillance had been a common feature across several recent cross-sectoral reports calling for more integrated and interdisciplinary data, place an emphasis on monitoring and surveillance of impacts to develop early warning systems and scenarios, focus on the complex interplay between risk, location and environmental conditions across scales of governance (from local to global) and to support timely and evidence-based decision-making to address short and long-term risks.

58. Several examples of existing observation networks were presented. These included the LTER-Europe network comprised of 1,800 “sites” (albeit limited in scope) and “platforms” and the LTSER (long-term social-ecological research) which is under development in the LTER-Europe. Observation networks in other regions discussed include the international LTER (ILTER), acting as a “network of networks” of research sites spanning a vast array of ecosystems which can help to strengthen scientific knowledge of environmental change across the globe. The INDEPTH Health and Demographic Surveillance System (HDSS) were also presented as well as thousands of Biodiversity Observation Initiatives (BOI’s) active in bringing the data together under GEO-BON, to better understand change across various biodiversity dimensions and scales.

59. Several challenges to Future Earth development were identified. Despite these, he noted that there are nonetheless several potential benefits to be gained from a well-functioning KAN such as the ability to establish contacts scientists/groups with similar interests; the potential contribution to well-designed global research agenda and for conducting policy-relevant. It also provides an opportunity to contribute to and benefit from systematic reviews of published science, access to field observation stations and to learning from the experience of others.

60. The presentation that followed, by Ms. Karin Zaunberger of DG Environment at the European Commission, focused on Mainstreaming biodiversity and health linkages in the European Union. She provided an overview of programmes on Environment and Health. Among them, the 7th Environmental Action Programme (EAP), which entered into force in 2014, will guide European environment policy until 2020 though it sets out a vision to 2050. One of the 7th EAP three key objectives is to safeguard EU citizens from environment-related pressures and associated risks to health and wellbeing. The EAP includes a number of “enablers” aimed at helping European countries to deliver on objectives. These include: better implementation of legislation; better information by improving the knowledge base; more and wiser investment for environment and climate policy and full integration of environmental requirements and considerations into other policies. Two other horizontal priority objectives also seek to make cities more sustainable and help the EU address international environmental and climate challenges more effectively.

61. She also noted that several measures were implemented across the EU to support research and more can be done to better mainstream biodiversity and health linkages in this area. The current EU health research programme under Horizon 2020 acknowledges the important link between environment and health and so has established two larger initiatives for environment and health. One of them is The European Exposome Cluster, running from 2012 to 2018, aimed at creating a framework to improve understanding of all the exposures and related health impacts (of pollutants, noise, food ingredients, consumer products, natural or urban environments, etc.) over an individual's lifetime. The European Human Biomonitoring Initiative (HBM4EU) was also developed to create a joint-European programme addressing the exposure of European citizens to chemicals and the potential impact of such exposure on human health. This may also provide an opportunity for biodiversity and health mainstreaming.

62. Other potential areas for future collaboration for biodiversity and health mainstreaming also include The European External Action Service (EEAS), and One Health. In particular, the EU had recently adopted a new EU Action Plan to tackle Antimicrobial Resistance.

63. National Governments have an important role to play in mainstreaming biodiversity and health linkages. There was also support from the bottom up, from citizens across the EU as this was an issue-area that was close to everyone's heart. Input from citizens and bottom up approaches had a lot of potential and there was a real opportunity to link to the positive health benefits arising from biodiversity and working relationships to people.

64. At the same time, at a regional level not all issues were equally integrated or mainstreamed or had equal degrees of influence. DG environment had relatively lesser influence than other areas such as agriculture and there was room for improving the linkages across these other areas including with agriculture, transport and others.

65. Ms. Zaunberger noted that in regard to linking the benefits of biodiversity and health, at the EU level, there had been considerable progress made. Current programmes did quite well and the implementation of measures that linked to the health benefits of biodiversity fit in well. In addition to the 7th EAP, she noted the relevance to several other initiatives such as the European Commission's Action Plan for nature; people and the economy which aimed to improve their implementation and boost their contribution towards reaching the EU's biodiversity targets for 2020; an EU Adaptation Strategy which looked at ecosystem-based adaptation, the Green Infrastructure (GI) strategy on Enhancing Europe's Natural Capital; and a EU 2020 Biodiversity Strategy and the Roadmap to Resource Efficiency.

66. Ms. Zaunberger further noted that Horizon 2020 also had a Focus Area on Nature-based solutions (NbS), which helped decision-makers, planners, promoters across different Ministries not only the Environment Ministry to invest in green infrastructure and adaptation projects at local, regional, national and cross-boundary levels. The problem that arised was that while those within the Environment Ministry may agree on a measure, other Ministries may have different views of green infrastructure and ecosystem-based adaptation measures. However, there was significant opportunity for mainstreaming in this area to ensure its inclusion as a focus of the next programme.

67. There were considerable opportunities for novel implementation of initiatives that had been made using EU regional funds or through other initiatives such as the LIFE programme. Ms. Zaunberger also noted that under Natura 2000, there were 18,000 sites covering 27 % of the EU territory and 50% of the EU urban population lived within 5 km from a Natura 2000 site. She emphasized the importance of showcasing and sharing leading examples and best practices such as these across the region, noting in closing that if nature were a pill it would be prescribed by doctors.

68. The next presentation, by Ms. Chadia Wannous of UNISDR, addressed building resilience for health systems in Disaster Risk Reduction. Her presentation was focused on the need to coordinate work at the intersection of health and biodiversity to support disaster risk reduction to ensure we build resilient health systems capable of preventing, mitigating and responding to all types of disasters.

69. She introduced the Sendai Framework for Disaster Risk Reduction adopted in 2015 by all member States. The expected outcome of Sendai is to achieve the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.

70. Ms. Wannous emphasized the need to shift from managing disasters and reactive approaches to more preventive measures to avoid risk in the first place and reduce the exposure of populations to hazards. She also noted the need to build preparedness and resilience to disasters. She further discussed the priority actions and seven global targets of the Sendai Framework noting that four of the seven global targets directly link to health (reducing global disaster mortality; reducing number of people affected by disasters; reducing disaster damage to critical infrastructure and disruption of basic services; and increasing the availability of and access to multi-hazard early warning systems and disaster risk information).

71. Ms. Wannous also noted that health was integrated into the Sendai Framework because many health and food emergencies of global significance such as Ebola, pandemic influenza and SARS were reported. These had significant impact on human life in terms of mortality but also had significant economic impacts. For example, the 2003 SARS outbreak in Southeast Asia, there were 800 deaths and generated US\$54 billion in economic costs in just a few months. At the same time, the intensity and frequency of disasters was increasing because of many of the risk drivers addressed by the speakers throughout the day, including land-use, food industry changes, agricultural intensification, war, conflict and others. Extractive industries alone for example, had been estimated to generate an economic impact ranging between US\$10-40 billion in potential liability over the next 10 years. The combination of these risk drivers also increased the risk of infectious disease emergence in addition to impacts on biodiversity.

72. While Sendai provided a policy framework it is important to focus on its implementation. To support this a Conference was held in collaboration with UNISDR, WHO and the Government of Thailand to discuss the operational aspects, which adopted the “Bangkok Principles” and recommended measures for implementation in a comprehensive, multi-disciplinary, multi-sectoral and all-hazards approach for disaster risk reduction. She noted that the Bangkok Principles provided an opportunity for further mainstreaming of health within and across other sectors, to build more inclusive partnerships. On the issue of the evidence base, she emphasized the importance of having data from the health sector noting that even data as well as risk assessment methodology and tools were siloed and could be better integrated across sectors. She also highlighted the need for further coherence to implement the Sendai Framework, the Paris Agreement, the SDGs and other global commitments including the Strategic Plan for Biodiversity 2011-2020.

73. Ms. Wannous provided several examples of how this could be achieved on the ground. She highlighted ongoing collaboration with international agencies such as the World Bank, CBD, WHO and OIE to better integrate disaster risk reduction under One Health, including to mainstream biodiversity linkages across this work. Much more could be done to further integrate biodiversity and health linkages across disaster risk reduction and there were still many siloes that had to be overcome to effectively mainstream health, biodiversity, and the impact of climate change on health in this area as these were not yet strongly reflected in this work. They hoped to work with many countries and agencies around the world to advance this agenda.

74. Ms. Theresa Mulliken, of TRAFFIC International and the IUCN SSC Medicinal Plant Specialist Group, provided an overview of TRAFFIC International (a strategic alliance of WWF and IUCN), its establishment, goals and mandate, noting that there were very strong links between the use of wild plants, human health and biodiversity, including wild plants as a source of traditional medicines, food, and as the source of pharmaceuticals and the importance of sustainable management of the harvest and trade of wild plants to protect species, habitats and ecosystems.

75. Wild plants were often a predominant issue at the intersection of biodiversity and health and many best practices were available and many measures at the landscape level to help people that live with

and rely on these resources for their healthcare, nutrition and livelihoods. One of the challenges of working with species of medicinal and aromatic plants were that many were also used for many other reasons including food, cosmetics, spices making it a difficult trade to understand, manage and support well because one species can be going in many different directions for different uses. Medicinal plant trade is also an issue of economic significance, and hidden harvest has high economic value (e.g. in China alone, in 2013, 1.3 billion kg of exports was estimated at some USD\$5 billion).

76. She noted that in a survey on wild forest products 15,000 households from 28 countries in Europe were asked about their relationship with wild forest products. 91.5 % of households have used wild forest products (likely including animals), 82 % of those were purchased from a shop and 25% of households surveyed collected wild forest products from the wild. Many people in the region are going into nature and making use of wild forest products. She noted that recent data also shows that trade (both import and export) in medicinal plants is markedly increasing. Major importing countries include Germany and France. Europe plays an important role in the international trade of medicinal plants.

77. Globally an estimated 60,000 plants were used medicinally worldwide. Of those about 300 were traded internationally. In 2016, they carried out an analysis to examine how many medicinal plants were commercially cultivated and found that in Europe many of the wild species used in Europe were still being harvested from the wild. Ms. Mulliken noted that when examining the total threat to wild plant species it was noted that approximately one fifth of the total were threatened with extinction in the wild.

78. A review of the conservation status of medicinal plants was carried out in Europe in 2015 and of the 500 species assessed, only 5 % were critically endangered but when you also considered the endangered and vulnerable categories, the proportion rose to an alarming 45 % and 31 % had declining populations. Main threats to medicinal plants in Europe include the collection of plants from the wild followed by loss of habitat and agriculture. Other challenges associated with the trade of wild plants included: increasing demand; complex trade chains; millions of wild-harvester located in poor, marginalized regions; complex legal structures (e.g. harvest, transit, tariff measures, ABS, etc.) and much underreported and informal trade.

79. Ms. Mulliken highlighted the need to support work on for the sustainable management and conservation of medicinal plants at the international level including the Guidelines for the Conservation of Medicinal Plants jointly developed by the WHO, IUCN and WWF, the CBD Global Strategy for Plant Conservation and the chapter on Medicinal Plants in the State of Knowledge Review, CBD objectives on access and benefit-sharing, a number of national government policies, practical tools, and voluntary standards and certification frameworks can all contribute to raising awareness to the implementation on the sustainable use of medicinal plants (including social and environmental sustainability), to supporting Aichi Biodiversity Target 14 and ensuring that plant trade was maintained within sustainable levels for CITES. She emphasized the need to work with local communities, and respecting traditional knowledge in developing those practices.

80. She also presented the Fairwild Standard, a tool used by Governments, companies and others to support risk analysis, resource assessment and to ensure that medicinal and aromatic plants and other non-timber forest products were managed sustainably and ensure shared benefits with harvesters. She noted that approximately 400 tonnes of Fairwild medicinal species were traded annually, and it was growing and they worked with a number of different users, including the private sector, national Governments to shape harvest and trade policies, and can be strengthened through implementation of the CBD Global Strategy for Plant Conservation and the WHO-IUCN-WWF Guidelines under development.

81. The Fairwild Standard was applied by companies through third party certification in a number of places and for a large number of products (for example licorice which is wild harvested). For example, there was a project linked to Natura 2000 in the EU on looking at wild plant connectivities in economically less developed countries, to maintain local traditions, traditional knowledge and income generation, which was important as a lot of the knowledge on wild harvest and sustainable wild collections rested with communities and that knowledge was being eroded and lost.

82. She noted that so much had been done and there was a vast array of practical tools and opportunities available and great stories that could be shared that helped humanize the importance of maintaining biodiversity and supporting health and well-being.

83. To conclude, a number of recommendations were made to support more sustainable use and trade of wild plants, including by:

- (a) Assessing use, trade and threat status of key medicinal resources and develop management plans;
- (b) Building on and strengthen community-based participatory models and integrating them with health care and livelihood programmes;
- (c) Effectively regulating the collection and promoting sustainable harvest practices;
- (d) Supporting and championing the finalization and implementation of the Guidelines on the Conservation of Medicinal Plants;
- (e) Facilitating capacity building of resource managers;
- (f) Promoting the best practice framework, the FairWild Standard;
- (g) Encouraging multi-stakeholder approach to sustainable use of plants;
- (h) Encouraging networking and up-scaling existing good practices.

84. Ms. Rebecca Miller of the IUCN, who presented on the IUCN Red List of Ecosystems (RLE), a relatively new tool developed by IUCN to help support decision making around land use management. Ms. Miller noted that ecosystem function and ecosystem resilience underpin the benefits to health and to human societies (from the delivery of nutritious foods to the regulation of disease) and when ecosystem resilience and particularly ecosystem function and the processes that underlie ecosystems were balanced and functioning we often see direct benefits to human health through the services they support and deliver. Conversely, we lose benefits when these natural processes break down.

85. Threats to biodiversity, including changes in land-use and cover, resource scarcity, climate change, can all pose direct threats to human health. One of the messages that came out strongly throughout the day was the need for an evidence-based understanding of the world around us that can be supported with scientific knowledge. The RLE categories and criteria were adopted by IUCN in 2014 and provide a tool to evaluate ecosystem function and ecosystem processes more objectively and scientifically. It is a practical tool that seeks to address fundamental questions: Which ecosystems are most at risk of large changes that involve loss of diversity? How great are the risks? How soon are the changes likely to occur? .

86. RLE methodology examines different pathways toward collapse, assessing the loss of native biota and biodiversity loss by assessing changes in ecosystem distribution (small ecosystems that are undergoing other declines) or changes in other processes (e.g. biotic processes) to measure the different pathways to collapse using 5 quantitative criteria used to assess declines in distribution or changes and functional processes. It also makes it possible to identify the triggers of ecosystem change. Each criterion has sub-criteria that represent different measure of risk (e.g., different timeframes or distribution metric). Based on the analysis, the ecosystems are identified based on different categories of threat, ranging from least concerned, to collapsed. Essentially, it assesses risk of ecosystem collapse, as measured by losses in area, biotic/abiotic degradation, and modelling. It is designed to be a baseline tool that, with repeat assessments over time can contribute to adaptive management and to measure impacts of measures that have been implemented to address ecosystem threats.

87. Ms. Miller also discussed the components of risk assessment that help to inform decision making. She noted that importantly, the RLE was not designed to assess the loss of ecosystem services but of biodiversity loss and while there is not a direct link between biodiversity conservation and ecosystem

services, it does provide important contextual information that can inform on how likely a system will likely be able to continue to provide ecosystem services.

88. RLE assessments range anywhere between 5 and 20 pages of detailed information about the ecosystem, key components, different measurements of different variables and detailed maps and time series data on how the ecosystem has changed over time and its central purpose is to inform decision making over time.

89. There are three levels at which this methodology is targeted: individual ecosystem assessments, which can be at any scale, and often for particular management needs or private sector decision-making; and national and regional assessments. She also provided examples of RLE currently being prepared for Senegal, Results for non-riparian Mediterranean forest ecosystems in France. She also noted that this methodology has been tested in numerous regions worldwide and in Europe, Finland and Norway are using RLE methodology to update pre-existing assessments so the methodology is used to unite very diverse kinds of ecosystem assessment processes worldwide. Switzerland has also published an RLE and France has worked on a series of Mediterranean forest Assessments and there is also a strong research base in Ireland. There is now a move toward global thematic assessments (i.e. mangroves, corals, and the Arctic and Boreal assessments).

90. Ms. Miller noted that some countries are already integrating the RLE into their National Biodiversity Strategies and Action Plans (e.g. Norway, Madagascar) and it is having real practical applications. For example, the first Finnish assessment had a significant impact on the management of mires. In Australia, it is already being applied to the management of bushfire and the private sector has been informed by the data in these ecosystem risk assessments. In the context of health, RLE can help to identify priority areas to/for: Safeguard ecosystem services essential to health & well-being; Ecosystem restoration; Strengthen monitoring of areas potentially vulnerable to disease outbreaks, food nutrition insecurity, mental health, etc.; Create synergies between the RLE and other assessment tools, and for a more integrated assessment of trade-offs. She also noted that the RLE can directly and indirectly support the implementation of Aichi Biodiversity Target 14, the Strategic Plan more broadly, and the SDGs.

ITEM 5. DISCUSSION PANEL: INTERNATIONAL COOPERATION, SUPPORT NETWORKS AND TOOLS

91. The first portion of the discussion panel under Item 4 followed the presentations of Mr. Raivio, Ms. Zaunberger and Ms. Wannous. Ms. Mahy of WHO, who facilitated the discussion period. Following the two final presentations under item four, the full discussion panel was reconvened and participants were invited to contribute to discussions and questions and answers with participants. Elements of the discussion include:

- a) The need for more research in the area of biodiversity and health was acknowledged but it was also emphasized that publications such as the State of Knowledge Review and the Planetary Health report make it clear that there is sufficient research to find effective and creative ways of using existing knowledge we have at this intersection. It strongly emphasizes that there is no contradiction between the need to support research while at the same time carrying out practical measures to support implementation. There is always the capacity for reflecting rational human action and knowledge into policy, including with existing knowledge.
- b) It was also noted that exploring the common linkages between the health of humans, the health of other organisms as well as ecosystems constituted an important way forward in supporting more creative and influential research.
- c) Participants were invited to consider what concrete actions can be taken to effectively bring these dimensions together and mainstream biodiversity and health.
- d) Participants also emphasized the need to learn to use the vocabulary, tools and languages need to address different audiences is very important. Evidence is not always an argument to support action.

- e) To summarize previous discussions, the CBD Secretariat noted that it is not a question of whether we need more science or policy implementation. Both are needed. Science is at the heart of developing evidence-based policy but at the same time, the lack of complete scientific knowledge (which is not possible) should not be used as a pretext for inaction, which is often the case. It was also noted that much of the science that is produced is largely not translational, how do we make it more translational and accessible to policy makers. The importance of acknowledging different systems of knowledge was also highlighted as well as the notion of co-design and coproduction which are increasingly being adopted by international institutions such as IPBES and Future Earth.
- f) Some representatives inquired whether, given the wide-ranging area the issues that biodiversity and health linkages address, if there are any reviews on the proposed governance structure and governance systems to deal with this area. This was identified as a future need. Moreover, the need for communication across levels of governance is needed was also emphasized: this includes the need for both top down, which can provide the vision, and bottom up actions to galvanize support.
- g) It was also noted that more effort had to be made to produce, short, accessible and effective communication tools that could be easily used and referenced by policy makers, as well as case studies that can be shared and disseminated.
- h) The CBD Secretariat reiterated that they are inviting submissions of case studies by countries that showcase best practices and will be further disseminated both on the health and biodiversity website and some will be compiled into a second volume of the State of Knowledge Review, from science to implementation to support the implementation of the decision on biodiversity and health XIII/6. She reminded participants to submit their case studies as well as any communication materials they wished to include on the health and biodiversity website.
- i) It was further noted that two of the greatest challenges we face are behavioural change and governance (how do you transition toward sustainability). Efforts are being made to address this intersection but much more work is still needed. Ultimately, politicians do listen to the public and how we present our scientific message to the general public is critical as well as the attitudes of the general public. This is very different in different contexts. In some countries people trust science and scientific institutions but this is not uniform across all countries.
- j) It was also acknowledged that tools and processes such as those presented are valuable but there is a need to move beyond assessment as quickly as possible into the risk management of the ecosystem change that is already occurring. Urgent transformational change is needed.
- k) It was agreed that no single tool is able to provide a magic bullet, every tool has its limitations. However, tools such as the RLE do provide evidence-based assessment on the degree of degradation, the cut-off, and a basis for comparison, and contributes to strengthening the evidence base to inform the process.

92. Following a lively discussion panel the moderator thanked participants for an extremely productive and stimulating discussion and participants were invited to join an evening reception hosted by the Government of Finland.

ITEM 5. NATIONAL CROSS-SECTORAL PERSPECTIVES AND EXPERIENCES ON THE INTEGRATION OF BIODIVERSITY AND HEALTH LINKAGES

93. On the second day of the workshop, Mr. Cooper of the CBD Secretariat provided an overview of salient points arising from the discussions held during the previous day and inviting comments and questions. All participants were invited to prepare short country presentations, to report on respective national objectives, achievements and possible challenges in the implementation of biodiversity and health linkages in national biodiversity strategies and action plans or national health strategies. It was noted that these presentations provided an opportunity for country representatives to highlight any best

practices and related cooperation initiatives emphasizing, where possible, main outcomes, experience gained and lessons learned.

94. Mr. Cooper also reiterated core mandates arising from COP Decision XII/6 on biodiversity and health and reiterated the questions included in the background document, noting that these would also serve as the basis for three breakout groups (on “One Health”, “Food, nutrition and sustainable agriculture” and “Urban development and greenspace”) to be held later that afternoon and the following day. The questions participants were invited to consider are as follows:

- 1) *In the context of the implementation of mainstreaming biodiversity and human health to support the implementation of Decision XIII/6 and other global commitments:*
- 2) *What can the health and biodiversity sectors each do to achieve benefits human health and biodiversity at the same time?*
- 3) *What are the key elements for a joint action plan on human health and biodiversity?*
- 4) *What is needed, at the national and regional scales, in terms of research, capacity building and information dissemination for joint human health and biodiversity sector actions?*
- 5) *What, if any, are the best practices in your country that jointly address human health and biodiversity concerns and opportunities?*
- 6) *What collaborative mechanisms/examples currently exist within your country or region for cross-sector human health and biodiversity collaboration? How can we promote further collaboration? What impedes collaborative action?*
- 7) *What actions for human health and biodiversity are needed as a matter of urgency (1 year); medium term (2- 5 years); and in the long term (6 – 8 years)?*

95. Participants were invited to ask questions based on the background document on biodiversity and health and to ask any questions. Following Mr. Cooper’s introduction of relevant reporting processes under CBD-WHO joint work programme, Mr. Matthias Braubach, of the WHO regional office for Europe, provided a short presentation on relevant European WHO processes.⁴

96. Following Mr. Braubach’s presentation, an initial group of country representatives were invited to deliver their presentations based on their national experiences. Where there were two country representatives (from the health and biodiversity-related sector respectively, joint presentations were encouraged insofar as possible but could also be made separately.

97. Prior to the lunch break, all participants were invited to participate in a Guided “Healthy Walk in Nature” Tour, guided by Mr. Olli Manninen of the Finnish Association for Nature Conservation and by Mr. Jukka-Pekka Jäppinen of the Finnish Environment Institute (SYKE), Finland. Participants greatly enjoyed the experience and some suggested that this should be made a permanent feature of all future regional workshops.

98. Participants from the following countries delivered national presentations on the second day of the workshop, jointly prepared by the experts from the health and biodiversity sectors in a session facilitated by Ms. Cristina Romanelli (CBD-WHO Liaison on Biodiversity and Health). Presentations made during the second day of the workshop included contributions from the following national representatives: Dr. Voskehat Grigoryan, Ministry of Nature Protection and Dr. Arayik Papoyan, Ministry of Health (Armenia); Ms. Kerstin Friesenbichler, of the Umweltdachverband (Austria) who delivered a presentation and showed a short video on biodiversity and health, Ms Aynur Aliyeva of the Ministry of Ecology and Natural Resources (Azerbaijan); Ms. Lucette Flandroy, Food Chain Safety and Environment and Ms. Micheline Lelong, Ministry of Health (Belgium), and; Dr. Ahmed Salama, Ministry of

⁴ These are also summarized in the background document available from the workshop website at: <https://www.cbd.int/health/doc/workshops/finland-eu-workshop/hbws-2017-background-13oct17.pdf>

Environment and Dr. Omaima Ezzeddin, Ministry of Health (Egypt). Dr Salama delivered the joint presentation on behalf of both Ministries as the upcoming CBD COP 14 President and also showed a short video; Mr. Matti Tapaninen, Parks and Wildlife Finland and Prof. Timo Partonen, National Institute for Health and Welfare (Finland); Ms. Anaïs Goulas, of the national Institute of Health and Ms. Marion Porcherie, on behalf of the Ministry of Environment (France); Dr. Melissa Marselle, German Centre for Integrative Biodiversity Research (Germany); Dr. Anna Trakhtenbrot, Ministry of Environmental Protection (Israel); Aldo Di Benedetto, Ministry of Health (Italy); Ms. Aigul Turdumatova, Department of Biodiversity Management of the State Agency on Environment Protection and Forestry and Dr. Nurbek Kuldanbaev, from the Ministry of Health (Kyrgyz Republic); Ms. Angela Lozan, Ministry of Agriculture, Regional Development and Environment and Mr. Sergiu Ciobanu representing the Ministry of Health (Republic of Moldova); Ms. Brankica Cmiljanovic, Ministry of Sustainable Development and Tourism (Montenegro); Ms. Helle Margrete Melzter, Norwegian Institute of Public Health and Ms. Tone Solhaug, Ministry of Climate and Environment (Norway).

99. Following the joint presentation by the national health and environment representatives from Norway on the second day of the workshop, Ms. Romanelli introduced the following agenda item, noting that remaining presentations from country representatives of Ministries of Health and Environment would continue on the third and final day of the workshop deliberations to allow for an initial session of breakout group discussions.

100. The following country presentations were delivered on the third day of the regional workshop: Ms. Biljana, of the Ministry of Environmental protection (Serbia) followed by Dr. Branislava Matić Savićević of the Institute of Public Health (Serbia); Ms. Eva Viestová, Ministry of Environment (Slovak Republic); Ms. Breda Kralj of the Ministry of Health (Slovenia); Ms. Anki Weibull of the Environmental Protection Agency (Sweden); Dr. Roger Lauener representing the Ministry of Health (Switzerland); Mr. Vladimir Lekarkin, Committee of Environmental Protection and Mr. Rahmonov Rahmatullo, Ministry of Health and Social Protection (Tajikistan); Mrs. Elze Hemke, Ministry of Economic Affairs and Ms. Esther Putman, Ministry of Health (The Netherlands), who also presented a short video; Mr. Yakup Dagan (Turkey); Mr. Viktor Karamushka (Ukraine) and Mr. Mykhailo Koshelnyk, Ministry of Health (Ukraine). Following country presentations, Ms. Mirjana Milic, of the United Nations Development Programme was also invited to deliver a presentation on sustainable procurement, followed by a short video prepared by Health Care Without Harm.⁵

101. Examples of mechanisms or measures needed for integrating/mainstreaming health and environment issues, including biodiversity issues, were described in numerous presentations. An analysis of needs identified and presented by country representatives in their presentations was carried out and summarized by the CBD Secretariat and WHO. These are presented as annex 1.

102. Following the country presentations on both the second and third days of the workshop, an interactive exercise tasked participants with convening into one of three break-out groups to examine potential activities that can be carried out jointly by the health and biodiversity sectors, obstacles to collaboration and some solutions across three core themes addressed in the workshop and described under item 6.

⁵ All country presentations, for which a Power Point Presentation is available, can be accessed on the website for the European Regional workshop at: <https://www.cbd.int/health/european/presentations/default.shtml>

ITEM 6. KEY OPPORTUNITIES AND CHALLENGES FOR MAINSTREAMING BIODIVERSITY AND HEALTH LINKAGES IN RESEARCH, POLICY AND PRACTICE

103. As with the previous agenda item, agenda item 6 was also carried out over two days, during the second and third day of the workshop. Specifically, agenda item 6 was introduced by Ms. Cristina Romanelli in the afternoon of the second day of the workshop. The breakout group discussions were preceded by a presentation by Dr. Rafael Ruiz de Castañeda of the University of Geneva, who presented a Massive Open Online Course (MOOC) on Global Health that had also been presented to members of the Interagency Liaison Group on Biodiversity and Health in May. She noted that CBD and WHO have agreed to prepare a 10-part module for the course on Global Health as a tool to support capacity-building and mainstreaming of biodiversity and health linkages. The short introduction to the MOOC is available on the workshop website and is also publicly available at: <https://www.youtube.com/watch?v=WT7-cC21uLU&feature=youtu.be&list=PLnZcy8OmLJ2wB7Fa8Zlh-QKYIwrVhTir>

104. Moreover, in his presentation on *Biodiversity & Global Health in the Digital Age: From MOOCs to Citizen Science & Crowdsourcing*, Dr. Rafael Ruiz de Castañeda also noted that in collaboration with CBD and WHO, the University of Geneva would follow up with some survey questions to be shared among participants after the workshop, in order to better identify capacity building needs among policy makers, with a view to preparing a full online course, targeted to policy makers, on the findings of Connecting Global Priorities: Biodiversity and Health.

105. Following the presentation, Ms. Romanelli reiterated the questions for the three breakout groups and described the thematic areas that would be discussed by participants in each of the breakout groups to discuss strategic steps to advance cross-sectoral cooperation for the conservation and sustainable use of biodiversity while maximizing human health gains in the region. She explained the each of the breakout groups would each address: 1) *One Health* 2) *Food, nutrition and sustainable agriculture*, and 3) *Health and well-being in urban environments*. Participants were invited to identify a group in which to contribute over the next two days. On both days, each group was led by national representative(s) who would be asked to report on outcomes of the discussion with support from designated resource persons. The “One Health” breakout group was led by Ms. Marion Porcherie and Ms. Anais Goulas (France) with Mr. Robert Koch and Ms. Cristina Romanelli as resource persons; the group on “Food, nutrition and sustainable agriculture” was led by Marina von Weissenberg (Finland) together with rapporteur Ms. Angela Lozan (Moldova), Mr. David Cooper, and Mr. Graham Rook as resource persons and the breakout group on “Urban development and greenspace” was led by Ms. Melissa Marselle (Germany) with Mr. Conor Kretsch and Mr. Mathias Braubach as resource persons. A summary of discussions and recommendations made in each of the breakout groups sessions, and reported on the last day of the workshop by country representatives is included as Annex II.

106. On the final day of the workshop, following the remaining presentations from national representatives from Ministries of Health and Ministries of Environment, two final expert presentations were delivered to further contribute to breakout group discussions. The first of the presentations on Biodiversity, globalization and communicable diseases in Europe was delivered by Mr. Jonathan Suk of the European Centre for Disease Control.⁶ Following his keynote presentation on the third day of the workshop, Mr. Suk also contributed to the breakout session, as an additional resource person for the One Health breakout group.

107. Mr. Jonathan Suk’s presentation was followed by an expert presentation by Mr. Hans Keune, on *Building Inclusive Communities of Practice for One Health*, which focused, among other areas, on sharing experiences and lessons learned in the European region, including from European One

⁶ The full presentation is available from <https://www.cbd.int/health/doc/workshops/wshb-euro-01-presentations/communicable-diseases-europe-ECDC-suk.pdf>

health/EcoHealth workshop held in Belgium in October 2016 (https://www.cbd.int/health/eu_bbp_onehealth_workshop.pdf).⁷

108. Following the expert presentations, participants were invited to reconvene in breakout group sessions to continue and finalize the discussion for each of the three breakout groups identified under item 6. Participants were reminded of the need to identify concrete, tangible actions that could be implemented to support mainstreaming of biodiversity and health linkages in these breakout group discussions.

ITEM 7. POLICY OPTIONS AND STRATEGIES FOR A MORE INTEGRATED APPROACH TO HEALTH AND BIODIVERSITY AND WORKSHOP CONCLUSIONS

109. Participants reconvened in breakout sessions to further discuss and finalize potential policy options and strategies discussed throughout the course of the workshop and in the breakout sessions on the preceding day. Participants were encouraged to reflect considerations raised in their respective country presentations presented under item 5.

110. In this final breakout group session held following the lunch break, the “One Health” breakout group was led by Ms. Marion Porcherie and Ms. Anais Goulas (France) with Ms. Cristina Romanelli and Mr. Jonathan Suk as resource persons; the group on “Food, nutrition and sustainable agriculture” was led by Ms. Angela Lozan (Moldova), with Mr. David Cooper and Mr. Graham Rook as resource persons and the breakout group on “Health and well-being in urban environments” was led by Ms. Melissa Marselle (Germany) with Mr. Conor Kretsch and Mr. Mathias Braubach as resource persons.

111. A summary of discussions and recommendations made in each of the breakout groups sessions, and reported by each of the representatives is included as Annex II.

112. Following reports from breakout group sessions, participants were invited to reconvene for a brief plenary discussion to highlight additional elements they wishes to see reflected in workshop conclusions. This discussion was moderated by Ms. Cristina Romanelli and Ms. Marina Maiero. Additional conclusions from this final discussion are summarized below:

- (a) Ensuring the connections between biodiversity and health and the Sustainable Development Goals are made
- (b) Recognizing the value of ecosystem based approaches to supporting health and biodiversity outcomes
- (c) Emphasizing the value of multi-functionality in maintaining stable and productive ecosystems. I.e. the importance of biodiversity for the integrated functioning of ecosystems (across multiple taxa, trophic levels and habitats) rather than the benefits of biodiversity on individual ecosystem functions. Biodiversity may contribute to maintaining multiple functions at higher levels across aquatic and terrestrial habitats.
- (d) Placing emphasis on positive outcomes of cross sectoral collaboration
 - i. Investments in communication to develop and disseminate a positive narrative are essential. Cross-sectoral collaboration is essential for disseminating these messages.
 - ii. Disseminating the multiple benefits of investments in nature through concrete dialogues targeting tangible outcomes
 - iii. There should be more targeted action for the biocultural dimensions of health
 - iv. Raising awareness between and across levels of governance is essential
- (e) Education and awareness raising should be acknowledged as key components of mainstreaming biodiversity and health linkages

⁷ Mr. Keune’s presentation is available from the workshop website: <https://www.cbd.int/health/doc/workshops/wshb-euro-01-presentations/communities-of-practice-keune.pdf>

(f) Consider whether joint action plans on biodiversity and health are really the way forward or ensure that there is mainstreaming across sectors. It was noted that it would be valuable to integrate across existing mechanisms;

(g) Expanding the scientific evidence-base of exposure to biodiverse green spaces is needed; expanding the evidence base of the benefits of biodiversity. At the same time, incomplete evidence should not be an excuse for inaction. There are a variety of measures that can and should still be implemented under “no regrets” approach to decision making in the face of biodiversity loss;

(h) There should be greater information sharing between CBD and WHO;

(i) At the ministerial level, there should be more coordinate strategies. In particular, there is a need for broader inter-ministerial dialogues, including a more coordinated strategy is required between the health, environment and agriculture sectors;

(j) Knowledge and information-sharing platforms are essential (through formal collaboration and information exchange mechanisms as well as through knowledge systems);

(k) No single sector should lead the mainstreaming effort. All sectors should have shared responsibility.

113. It was agreed that the CBD Secretariat and WHO would prepare a draft list of broad conclusions/recommendations derived from the based on the discussions held during the workshop encapsulating some of the key elements addressed in national and expert presentations. It was agreed that these conclusions would subsequently be presented to participants for discussion following the conclusion of the regional workshop. These draft conclusions, once agreed among all workshop participants, will be made available on the workshop website at <https://www.cbd.int/health/european/default.shtml>

ITEM 8. CLOSING OF THE WORKSHOP

114. Mr. David Cooper, Deputy Executive Secretary, CBD Secretariat, introduced H.E. Minister Pirkko Mattila, Minister of Health and Social Affairs, Finland expressing gratitude for taking the time to deliver closing remarks for the workshop. He also gratefully acknowledged that the workshop had been opened by the Minister of Environment, H.E. Minister Tiilikainen at the opening of the session indicating that the fact that we have present at the workshop Ministers from both Health and Environment, is testament to Finland’s whole-of-government approach to the interlinkages between environment and health, as a part of the broader approach to sustainable development.

115. Mr. Cooper provided a summary of discussions held during the three-day workshop to H.E. Minister Pirkko Mattila and participants. He reiterated key messages presented by Dr. Tedros Adhanom Ghebreyesus, Director General of WHO, in his opening remarks. The Director General had emphasized that the impacts of climate change and other global environmental changes, including biodiversity loss, is one of his new top priorities and referred to a major study that WHO and CBD had jointly prepared, the State of Knowledge Review on Biodiversity and Health, calling upon participants to put this into action through national plans which was the core aim of this regional workshop. It was noted that a key objective of the workshop was the need to provide guidance to support implementation on decision XIII/6. Mr Cooper noted that a vast amount of research had been carried out in this area in recent years, including on the importance of the human microbiome, its connections with broader environment, and its role in human health including in immunoregulation, and its interaction with non-communicable diseases. Participants also heard about biodiverse green spaces and its links to human health both physiologically and psychologically, and the reports of the WHO regional office for Europe were also presented. Moreover, the value of diversity in providing healthy diets and the importance of diversity in production systems as well as the complex relationships between biodiversity and disease, including vector-borne diseases and integrated approaches such as One Health were also discussed. In this context, participants discussed how a better understanding of biodiversity, ecological and evolutionary processes it entails can help us manage better the complex systems that we live in and encompass our food systems, and the way we plan where we live and interact.

116. Summarizing the consensus among country representatives from the health and biodiversity sectors, Mr. Cooper noted that there is a lot more exciting research underway and this research is important. However, existing scientific knowledge is sufficient to move to concrete action. In particular, there are a number of “no-regrets” actions that can be made. There was also a strong consensus that we invest too little in preventative measures and correspondingly spend too much money and effort on responsive measures, not only in our health systems but also in agricultural systems. Participants further agreed that by investing more in so-called “nature-based solutions” we can shift the balance to more effective, efficient and coherent systems of governance. The need to jointly address the drivers of global environmental change, biodiversity loss and ill health had also emerged as a prominent theme. From discussions held during this workshop it was clear that it is essential to continue this dialogue, particularly at the national level following the workshop, including not only among sectors represented here but also with other sectors including spatial planning, urban planning, and food and agriculture. The SDGs and 2030 Agenda provide an excellent overview and framework for this and there is an imperative to keep working together to continue to translate measures into action.

117. In her closing remarks, H.E. Minister Mattila emphasized that the aim of the cross-sectoral workshop was to strengthen cooperation, engagement and policy coverage between national agencies responsible for biodiversity and those responsible for health, noting the value of this effort to help policy-makers to mainstream biodiversity and health linkages in national biodiversity strategies and national health strategies. She noted that, today, health is produced everywhere in society, through the influence of all sectors, through their impact on health determinants and through risk factors of ill health.

118. H.E. Minister Mattila noted that in 2006 Finland launched the “Health-in-All Policies” initiative, also in the EU context. She emphasized the common goal of enhancing knowledge of these issues and to bear in mind that any given intervention ultimately has an impact on health. She also emphasized Finland’s commitment, across all government sectors, to enhancing and supporting evidence-based actions, supported by scientifically sound research. The Minister noted that Finland’s past and future achievements will ultimately flourish in a very different world, including as a result of the speed with which lifestyle changes occur, and as a response to rapid access to information. She highlighted her commitment for evidence-based research and scientifically-sound knowledge including across each of the thematic areas covered in the workshop. The Minister indicated that she is particularly interested in the themes discussed during the breakout sessions, including opportunities and challenges of mainstreaming biodiversity and health in research, policy and practice.

119. She also provided an example of Finland’s successful work on nutrition and health called the North Karelia Project which began in the 1970s to address the high mortality rate associated with cardiovascular disease. In that context, government began to implement policies that have fundamentally changed diets of Finnish people and sought to implement measures to achieve a more balanced and healthy Nordic diet. As a result, the mortality rate today is low compared with the European average, and the next step can be to explore how to maximize health benefits associated with the use of resources from Finland’s wild nature. Building on the opening statement of H.E. Minister Kimmo Tiilikainen, she also noted opportunities to explore public-private partnerships and to support global initiatives such as the UN Decade of Action on Nutrition. The latter provides tangible possibilities and a framework to promote diets that are both sustainable and healthy.

120. The Minister also noted the importance of carrying out further scientific research on the value of physical activity in natural environments as a measure to support mental health outcomes, and whether such spaces can be used to promote mental health and well-being. The disease burden posed by air pollution was also acknowledged as were Finland’s efforts to improve air quality in urban areas. She noted that there is accumulating evidence that green spaces within urban areas near housing is beneficial to health and provide opportunities to reduce air pollution as well as exposure to light pollution and noise. Sharing knowledge and best practices across different stakeholders were identified as central to this endeavour. She also noted that reducing morbidity and mortality from non-communicable diseases is possible, provided that multiple interventions are implemented at the same time.

121. H.E. Minister Mattila concluded by expressing support for a sustainable future founded on a One Health spirit, noting that cross-sectoral cooperation can be strengthened through national, regional and global networks. She expressed the need to better coordinate policies options and strategies to achieve a more integrated approach and to move towards collaborative best practices between health and biodiversity. To conclude, she indicated her desire that discussions held in Helsinki would help to translate public research and common understanding to the benefit of biodiversity, health and well-being of all.

122. Ms. Anni Virolainen-Julkunen, Ministry of Health and Social Affairs, Finland, thanked all participants for attending the workshop, noting the challenge of convening participants from all corners of the European Region. She noted that these discussions were work in progress and she very much hoped it continued. From the perspective of the Ministry of Health and Social Affairs Finland, she noted that it remained a challenge to find common language between the Ministry of Health, their stakeholders and those working in environment, agriculture and other sectors. While they certainly did much work in a One health spirit, biodiversity conservation was understood in different ways across sectors. She noted that having the Ministers of Environment and of Social Affairs and Health in the workshop was not merely a ceremonial procedure, but it was essential to ensuring commitment for this work at a high political level and opens the door to further discussion and collaboration. The main message within the Ministry of Health was that what was most needed, as a next step, was to sit at the same table, at the expert level, and at the policy-making level, including with other Ministries. Ms. Virolainen-Julkunen noted that she was hopeful for a fruitful outcome. Ms. Virolainen-Julkunen, noted that she especially hoped to continue this work and dialogue at the national, regional and global levels. As these discussions encapsulate the meaning behind the phrase “healthy planet, healthy people”. She noted that she looked forward to next steps and wished all participants a safe trip home.

123. Mr. Jukka-Pekka Jäppinen also expressed his gratitude to all participants on behalf of the Finnish Environment Institute, Finland, also emphasizing that it had been a pleasure to know and engage with all participants and noting that he was confident that discussions held during the workshop would help to move policy agendas forward in respective countries, hopefully including at the regional and global levels. He then provided practical guidelines to all participants wishing to partake in the field trip to Vallisaari Island, sponsored by the Finnish Ministry of Agriculture and Forestry, guided by Ms. Minttu Perttula and Ms. Alina Tuomisto, Parks and Wildlife Finland, departing on the following day at 8:30 a.m. and leaving the island by boat at 11:00, returning by boat to Helsinki city centre, where participants could then enjoy the city, travel schedules permitting.

124. On behalf of the Executive Secretary of the Convention on Biological Diversity and WHO, Mr. David Cooper also extended thanks to the Government of Finland and to all the Ministries in Finland, who had contributed to the organization and great success of this regional capacity-building workshop in the European Region. He acknowledged, with gratitude, the presence of two Finnish Ministers, and several high-level representatives from other Ministries, Institutes and sectors from the Government of Finland, including those invited to attend the opening plenary.

125. Mr. Cooper also thanked all other co-organizers, Ms. Maiero (WHO), Ms. von Weissenberg, Ms. Virolainen-Julkunen and Mr. Jäppinen (Government of Finland), Ms. Romanelli (CBD-WHO Joint Work Programme) and Mr. Braubach (WHO Regional office for Europe) for their support in co-organizing the workshop, noting that there is a lot of work that goes into the preparation of these workshops but there will also be a lot of work in the follow up to support mainstreaming. He also thanked the European Union for financial support, WHO for sustained collaboration in jointly convening the series of capacity-building workshops and the WHO regional office for Europe for its Technical support for this workshop. He also thanked all participants for their active role in sharing their expertise, experience, knowledge and for engaging in passionate discussions. He also noted that the location chosen by the Government of Finland for this workshop was ideal and encouraged participants to partake in enjoying more of Finland's nature by joining the field trip, if itineraries permitted.

126. The workshop closed at 6:15 p.m. on 25 October, 2017.

*Annex I***SUMMARY OF NEEDS IDENTIFIED BY NATIONAL REPRESENTATIVES IN THE EUROPEAN REGION**

The analysis of needs identified and presented by countries in their presentations to address the question of (short, medium and long-term needs) identified by national representatives have been summarized in the following priority actions:

Cross-sectoral dialogue and coordination

- Improving cross and inter-sectoral communication between environment and health sectors
- listen to and respect different visions/approaches of a problem and their respective plus-value in interdisciplinary working
- Delivering interventions in combination with a communication/marketing plan
- Developing new mechanisms and strengthening existing mechanisms in order to promote joint research, capacity-building and information dissemination for joint human health and biodiversity sector actions.
- Improving inter-sectoral communication and coordination mechanisms (local, national, regional, global);
- Improving the efficiency of interaction between ministries, departments, scientific institutions, NGOs, local communities in the management of biodiversity and protection of public health
- Integrating actions by the health sector to promote the health benefits of biodiversity
- better cooperation between beekeepers federations + animal health & pesticides departments of ministry + animal drugs agency + national food chain safety agency
- integrate various environment and health perspectives to address endocrine disruptors
- Strengthening and upgrading cross-sectoral cooperation across several sectors (health, environment, agriculture, energy, finance etc.)
- Improving synergies between biodiversity-related conventions, health and climate change including in the climate change adaptation strategy to reflect biodiversity and ecosystem services
- Supporting the implementation of the SDGs, including SDG 3 and linking with other SDGs
- Including better synergies between biodiversity and human health, including cooperation between CBD and WHO focal points
- Carrying out regional consultations and strengthening regional cooperation on biodiversity and health
- Strengthening work on biodiversity, health, food security and nutrition and improving cooperation between CBD and FAO focal points
- Strengthening cooperation with the Ministry of Foreign Affairs on better targeted ODA support (together with the CITES convention)
- Strengthening interlinkages between CBD and IPBES, greater involvement of experts on the national level (national platform for IPBES) and the working group for biodiversity

- Creating a European science-policy Environment-Microbiome-Health platform
- Community participation in processes to foster local ownership

Capacity-Building (local, national, regional)

- Increasing national and local capacity to respond to public environmental health risks;
 - Capacity-building for training (national, regional...), including through a continuing training process and making it inclusive (farmers, local communities, general public, policy-makers, etc.).
 - Capacity-building of local officials and institutions in developing future actions is needed.
 - Using a pilot approach at local level, including regional agencies and local authorities.

Education, awareness raising, advocacy and communication

- Develop a coherent narrative across environment, health and other sectors
- Engaging and raising awareness of the value of nature protection and biodiversity conservation among children and youth
- Raising awareness of the health benefits of wild foods and sustainable harvesting
- Increasing national awareness about biodiversity and health linkages and developing tools for awareness raising and advocacy
- developing e-learning modules for health professionals in environmental medicine.
- encourage sustainable production and consumption changes
- Tailoring information and advocacy geared toward decision-makers to foster a sense of ownership on linkages between health and biodiversity and to foster a common vision
- Increasing general awareness of local people and the general public about health benefits of nature protection and biodiversity conservation
- Engage with and raise awareness of the private sector
- Increasing general awareness of local people and the general public about health benefits of nature protection and biodiversity conservation
- Increasing awareness of potential trade-offs, and need to establish good relationships between policy representatives of diverse interests

Best practices

- Exchange of national experiences and best practices on effective cooperation in the field of human health and biodiversity.
- Developing efficient information management systems at local and national levels, and for the general public.
- Need for a clearing-house mechanism for biodiversity and health
- Stocktaking of experience and best practices (including traditional knowledge)
- implicate private sector responsibility, start by using easy case studies, listen to local knowledge

- support development of public-private partnerships

Infrastructure and Planning including urban planning

- Ecosystem management planning involving ecosystem services and healthcare issues.
- Effectively design and manage biodiverse green spaces to maximize the health benefits of contact with nature, including among children and the elderly
- Increasing/ensuring access to green spaces through the development of social and physical interventions
- Implementing “nature-based solutions”
 - Foster the application of nature-based solutions for climate change adaptation from society and policy
 - Develop nature-based solutions addressing water management by « nature-based solutions »
 - Promote measures for the development of and to support interactions with urban gardens
- Assessment and analysis of the situation to create the necessary infrastructure to improve the socio-economic situation
- Generating linkages with the local government public health sector in urban planning
- Reducing negative impacts at the local level by providing access to remote pastures: roads, electricity, bridges, sheds.
- Implementing measures to address water quality, eutrophication and its impacts on human health
- Establishing new protected natural areas, creation of appropriate infrastructure to reduce the burden on nature and ongoing monitoring the status of biodiversity and the impact of the environment on human health.
- Expanding green areas, monitoring the status of biodiversity and the environmental impact on human health, and effective and sustainable international collaboration and cooperation

Institutional frameworks

- Developing a normative/technical framework for biodiversity and health
- Adopt policy, mechanisms and procedures that promote the health benefits of biodiversity conservation (no regrets policy)
- overcome vertical organization of public administrations; mutual respect; inter-and transdisciplinary education; criteria & indicators; public involvement.
- multidisciplinary/multi-sectoral policy platforms where ministers/cabinets approve decisions that have been prepared by multidisciplinary civil servants and expert platforms
- Strengthen participatory approaches (engage the local level)
- Identify/facilitate opportunities for the equitable sharing of benefits
- Strengthen international collaboration/cooperation for One Health

Legal frameworks

- Harmonization of legal frameworks
- Analysis of legislative framework in the aspect of biodiversity, including using successful international experience.
- Strengthening the legislative framework that would secure implementation and harmonization of legislation, referring to biodiversity and health, must also become one of the national objectives.
- Implement measures to fight against illegal trade and other legal instruments to support prevention

Funding and finance

- Making funding available for mainstreaming of biodiversity and health linkages (local, national, regional, etc.)
- Making funding available for the implementation of projects on biodiversity and health
- Securing designated funding to address knowledge gaps

Prevention and disaster response

- Useful to initiate common work around concrete cases to be solved before « crisis » period, to foster mutual understanding and ensure preparedness when facing « crisis » (e.g.: endocrine disruptors, bees federal plan, bushmeat, invasive alien species, etc.)
- Strengthen disaster preparedness and climate mitigation and adaptation through ecosystem-based approaches
- Implementing measures to address eutrophication and its impacts on human health
- measures to address prevention, cure and care in conflict zones as military conflict absorbs a lot of material, financial resources and human lives

Risk assessment, preparedness and response

- Integrating environment-and-health risk management into local and national planning processes;
- Ensuring an adequate level of health-system preparedness and response in vulnerable sectors of biodiversity and ecosystem protection;
- Analyze potential impact on public health of legal and illegal national trade of exotic animals and plants, as well as of bushmeat.
- Carry out health risk assessment of impacts of pollution
 - Initial risks for health assessed on basis of environmental considerations has led to biodiversity protection thanks to human health protection measures

Assessment, tools and monitoring

- Creation of a single unified tool for assessing and analyzing the current state of biodiversity and the impact of the environment on human health.
- Assessing quality, effectiveness and feasibility of lifestyle interventions
- Strengthening, monitoring biodiversity and health risks and controlling disease systems

- Implementing a monitoring plan for exotic mosquitoes and related vector borne diseases and find the necessary budget for this project (in particular for mosquitoes monitoring Plan, including monitoring of vectors in addition to pre-existing monitoring of vector-borne diseases)
- Systematic monitoring of the impact of climate change on biodiversity and health.
- Improving the measurement of outcomes/measures implemented

Mainstreaming (NBSAPs, national health strategies, etc.)

- National Biodiversity Strategies should recognize and reflect the linkages between biodiversity and health.
- Needed collaboration of environment & human health & animal health & plant health policy departments & related scientists.
 - → usefulness of biodiversity sector to attract attention on poorly tackled existing health problems was noted
- Preventive and integrated approaches/One Health approaches is needed
 - respect the specific objectives/constraints of different stakeholders in transdisciplinary working
 - Integrating the social sciences in One Health projects, policies etc.
 - Facilitating an iterative process (policy/science/field/NGOs/...), networking, avoiding big new One Health institutions
 - Measures to address antimicrobial resistance
 - Strengthening cooperation/Mainstreaming biodiversity conservation and nutrition (local, national, regional, global)
- Aligning objectives of NBSAPs and health strategies with the SDGs and other global commitments
- Aligning biodiversity conservation measures with the UN Decade of Action on Nutrition
- National Action Plan for Environment and Health (WHO) and national biodiversity strategies and action plans also requires a number of initiatives: vulnerability analysis, risk assessment, the development adaptation strategies, raising awareness on the impact of climate change on biodiversity& health.
- National Biodiversity Strategy and Action plans should be more significantly recognized and accepted by other sectors and competent institutions as an umbrella document whose goals and guidelines should be included in appropriate regulations and strategic documents
- Developing a joint national action plan on biodiversity and health and/or mainstreaming biodiversity and health through cross-sectoral cooperation
- Creating mechanisms to calculate the economic benefits from the protection of biodiversity in comparison with the activities which lead to the loss of biodiversity affecting health.
 - Integration of these mechanisms into national policies, plans, budgets and strategies in relevant sectors have not been established so far.
 - Ensuring more significant funds for the initiation of the whole system. The existing databases are not networked.

- Connecting biodiversity to health priorities and developing a common language between sectors
- Mainstreaming biodiversity and health linkages in community activities (health and nutrition)
- Reinforce biodiversity and health linkages to maximize co-benefits (e.g. pollution and overexploitation of water environments, climate change biodiversity and health, environmental and internal microbiome, agrobiodiversity and nutrition, etc.)
- Strengthening links made between destruction of ocean biodiversity and food security/health
 - Microplastics are found in various environments (drinking waters, commercialized salts, etc.) → bad for humans' and health of aquatic animals → new threat for oceans' organisms and, in medium term, for human food security and health.
- Developing a more integrated package of measures sustaining health and biodiversity: the expansion of settlements and transport infrastructure, the increase in tourism and leisure activities in previously undisturbed regions, the development of renewable energy sources, the increasing intensity of agriculture in mountain regions, the fragmentation of natural habitats, the direct and indirect impacts of climate change, and the spread of invasive alien species are adding to already significant pressure on biodiversity with potential impacts on health.
- Delivering evidence-based interventions
- Connecting biodiversity and health with climate-discussion in order to create urgency and strengthening local communities in the field of biodiversity and climate change.

Research and information exchange

- Elaborating a mechanism of information exchange on transmissible and non-transmissible diseases at the regional level
- Expanding curricula at all levels on the SDG Agenda and its impacts
- Support national scientific research projects considering biodiversity and health linkages
- Supporting research and strengthening the evidence base (e.g. prospective, longitudinal population-based studies)
- Supporting research that focuses on maintaining health rather the relationship between biodiversity and disease
- Study and follow cataloguing of species (of plants).
- Study the interlinkages and improve the interface between health (domestic animals, wildlife, plant and human health) and ecosystem integrity.
- Supporting research on microbial diversity (precise links, impacts, determinants, etc.).

*Annex II***SUMMARY OF BREAKOUT GROUP SESSIONS*****Breakout Group 1- Vector-Borne Diseases, Zoonoses and One Health: Summary***

Country leads: Anais Goulas and Marion Porcherie (France)

Resource persons: Richard Kock (Day 2), Cristina Romanelli, and Jonathan Suk (Day 3)

Participants: Belgium, France, Monaco, Netherlands, Norway, Serbia, Switzerland, Ukraine, UNISDR...

Based on discussions with participants, key elements for the development of joint action plans on biodiversity and health include the following

CONTEXT/AIM

Group participants agreed that the overarching goal for adequate integration of biodiversity and health consideration in One Health approaches should be underpinned by the notion of socio ecological resilience.

BREADTH OF APPLICATION

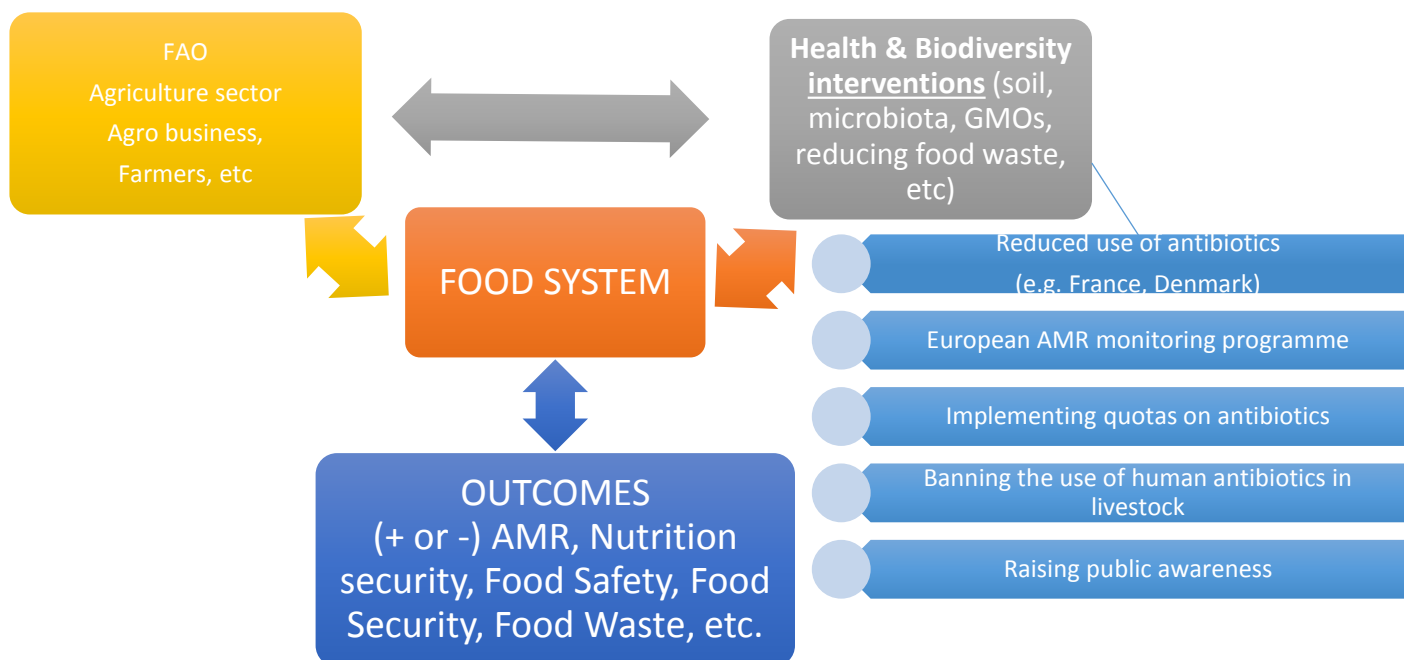
It was also noted that a **wide ranging application of One Health** was needed to address the full range of issues at the intersection of biodiversity and health (not only including traditional “One Health” issues i.e. infectious diseases, AMR, and food safety).

In line with this rationale, it was noted that One Health originated as One World One Health and became increasingly narrow over time.

Example of how the One Health could be expanded to other areas: the Food system as a key element to engage the different sectors in supporting joint action between environment and health given the importance of a sustainable food system for issues related to disease outbreaks, antimicrobial resistance, etc.

It was noted that the Food Systems should be addressed more holistically as a One health issue

- Nutrition was identified as a new key sector that could be linked to other issues e.g. food system more broadly
 - This can include AMR, food safety issues, food security issues, GMOs, and food waste, etc.
- In the context of food systems, it was also noted that soil health should be considered in OH policies, plans or actions
- It was also noted that the health sector often inherits problems from food systems/practices that are not thinking about health outcomes and the same can be said about biodiversity
 - OH can help to demonstrate a better chain of transmission, which has to be a collaboration across sectors so you don't stop investigation with a sick patient but go back to the source.



Potential measures or interventions identified e.g. to address AMR include:

- a) Measures to reduce antibiotics in livestock should be identified as a priority. It is already happening in some countries (e.g. France, Denmark, etc.)
- b) Adopting legislation to prevent environmental contamination with veterinary APIs (i.e. pharmaceuticals used for treating animals)
- c) Implementing a quota system for the use of antibiotics
- d) Increasing education to ban the use of all human antibiotics in animals in line with the Global Action Plan on AMR⁸
- e) Establishing a broad scale communication campaign to strengthen general public awareness of antibiotic overuse and misuse
- f) Noted that in non-western/developing countries, they have the reverse problem to AMR as in many cases they very limited access to antibiotics. This should also be considered.

Participants agreed that all One health policies and plans should address the following dimensions:

1. GOVERNANCE
2. LEGISLATIVE FRAMEWORK
3. KNOWLEDGE EXCHANGE PLATFORMS
4. JOINT COMMUNICATION STRATEGIES
5. EDUCATION
6. SURVEILLANCE AND MONITORING
7. RESOURCES
8. RESEARCH → Assessment

⁸ <http://www.who.int/antimicrobial-resistance/global-action-plan/en/>

Along these lines, it was further agreed that the following actions and considerations should be considered:

GOVERNANCE

- 1) **Cross-sectoral** collaboration should be strengthened as well as coherence between national plans/reporting instruments
 - a) Some examples were provided by participants of where biodiversity and climate change had been considered as interlinked issues in **national adaptation and biodiversity plans** but it was found that even in such cases, health issues were largely ignored. The need to correct the situation was noted as well as the opportunity for linking national adaptation plans with biodiversity and health considerations
- 2) **Local administration** needs to be closely involved; cannot only be national
- 3) **Different Ministries** must also be involved in some efforts as applicable, Ministry of Foreign Affairs, Ministry of Finance, Ministry of Defense, etc. as well as local administration
- 4) **Monitoring should be encouraged as a proactive measure** for prevention over reactive approaches
 - a. Priority areas for monitoring should be identified
- 5) It was also noted that One Health policies, plans and projects needed to be **tailored to the local situation on the ground.**
- 6) It was also agreed that **actions must be taken across scales** (e.g. local, national, transboundary/regional/international)
- 7) **Risk assessment and risk profiling** exercises should take into biodiversity, health, climate change and disaster risk reduction and assessments/ through expert consultations, groups should be made a priority
- 8) **Preparedness**: simulation exercises and scenario planning should be encouraged

KNOWLEDGE & INFORMATION SHARING

Multi-scalar Knowledge and Information Sharing Platforms should be established at the national and international levels. In particular:

At the **national level**:

- 1) A **multi-sectoral coordination mechanism/Shared Platform** should be established
 - a. It should seek to **identify** all relevant partners: bringing together health, biodiversity and/or environment, agriculture, finance, and other governmental representatives.
- 2) A **mechanism or process for dialogue** should also allow be established to allow for input and exchange across all levels of society
 - a. It should seek to be **inclusive, with input from the bottom up** in an ongoing iterative process
 - b. It is a communication platform that also allows for lay knowledge to be exchanged
 - c. Different levels from the national to the regional / local
 - d. experts

At the **international level**:

- 1) a **knowledge sharing/knowledge transfer platform** should be established
 - a. bringing together international organizations in biodiversity, health, climate change, and others with contributions from all relevant stakeholders
 - b. As an example, it was noted that the ECDC has a platform for environmental and health data in which people can upload geolocated information.
 - e. The platform should seek to facilitate and support dissemination of research and knowledge
 - f. It can also (though not exclusively) be issue-based with issues identified through an iterative process
 - g. Some activities under One Health are also positive for biodiversity management and vice versa. **Structuring communication** at the international level is also essential.
 - h. Relationship between environmental variables should be considered
 - i. Information systems / Clearing house mechanism
 - j. The cost of not doing/inaction should be clearly communicated
 - k. Having summaries of reports to make them understandable to policy makers
 - l. Scaling things to the national context is also important
 - m. Financial resources are essential and investments in this area be prioritized

COMMUNICATION & ADVOCACY

- 1) General **public awareness** about the links between biodiversity and health and core issues at the intersection (eg. AMR, nutrition, etc.) is needed
- 2) Developing a **communication strategy between sectors** is needed and could constitute an important communication tool
- 3) Defining and developing a **shared vision** is needed
- 4) From an advocacy point of view: informing decision makers of the **cost savings associated with prevention** was perceived as essential. It was noted that some studies have already been carried out in some areas (e.g. World Bank on infectious diseases) and these should be summarized and communicated clearly to decision makers
- 5) **Risk** communication is very important
- 6) Engaging the **social sciences** also needed

SURVEILLANCE AND MONITORING

- 1) **Purposeful and integrated surveillance** for vector-borne and zoonotic diseases; Integrated in that it should be carried out by biodiversity and health authorities and purposeful in that a priority list of diseases, conditions (e.g. weather and climate), or species should be determined based on national priorities, with a clear understanding of monitoring needs, as everything cannot be monitored in a world of finite resources. monitoring risk in order to adapt emergency scenario or actions implementation (for example, it is the case in Serbia and Belgium)
- 2) This can be envisaged proactive plan (as a preventive measure) as well as a response measure (to respond to a crisis)

As an example of a **proactive action plan**

 - a. that could be the role of a joint plan, for example on Climate change (as in the Netherlands) which includes the Ministry of Environment, Economy, Health, Foreign and International Affairs.
 - i. It will serve to adapt the strategies to the new concern of climate change which could be a big issue over the next year
- 3) **Contingency scenarios** must be developed

- 4) A **best practice** of surveillance of vector borne diseases was recently implemented in Belgium in which mosquitoes which were being monitored. A working group and guidance committee comprised of Ministries of Health, environment and defense
 - a. In order to engage an effective strategy against a crisis situation, it has to be harmonized between the different legislative frameworks (for example, to make sure that the product we need to eradicate mosquitos has to be approved by the REACH – EU platform)

Emergencies

- 1) In case of emergencies, other sectors (e.g. military) should also be called upon as needed

Communication/advocacy

The group identified issues around the need for communication at two levels:

- 1) A large communication related to population education, (for example on raising awareness of the Antibiotic use)
- 2) Communication mechanisms must be developed to tailor communication to communities or institutions when a risk has been assessed (for example, the mosquito surveillance system in Belgium)

Other considerations include

- 1) Communication coupled with advocacy is **KEY**.
- 2) Planning and anticipating how to communicate the information to the right people
 - Lists to Governments
 - Press list
 - Communication lists have been established in Belgium for early warning and response, this includes for potentially affected communities (Belgium)
- 3) Knowledge Exchange intra and extra regional is needed
- 4) Ensuring local/community level representatives are involved is essential

Multi-scalar/multi-issue governance

Finding key areas for collaboration and support from other levels to bridge with other sectors, develop working relationships in a structured manner:

- Under the umbrella of climate change and disaster risk, for example, the Sendai Framework was identified as a useful entry point which could be used to justify ministries action – provides a framework for national initiatives

Other Challenges:

- Often Project based
 - Identifying and mapping high risk areas (e.g. to identify areas for vaccination) to identify priority interventions can be used as a measure to overcome this barrier
- Difficulty in securing funding.

Breakout group 2: “Food, nutrition and sustainable agriculture”

Country lead: Ms. Angela Lozan (Moldova)

Resource persons: David Cooper, Graham Rook

Participants: Azerbaijan, Egypt, Finland, Sweden, Netherlands, Tajikistan, UK, Moldova

**Policy development and inter-sectorial collaboration for food safety
(environment+health+agriculture)**

- Mainstreaming biodiversity considerations into healthcare policy
- Improved collaboration between CBD/WHO/FAO FPs and task forces
- Develop coordination mechanisms for intersectoral collaboration between the Ministry of Environment & Ministry of Health
- Raise awareness of policymakers and decision-makers for sectors

Promote diversity and sustainability

- Promote genetic diversity of indigenous agricultural crop varieties: fruit trees, grapes, tomatoes, potatoes, etc.
- Traditional plant varieties and wild relatives.
- Support agrobiodiversity: small-scale farming combined with forest and biodiversity plots
- Increase the variety of plants in agricultural crops to ensure stability and ecological balance of agricultural farms
- Landscape resilience and diversity. Ecosystem services

Intersectoral institutional capacity

- Establish monitoring and early-warning systems, biological control (phytosanitary, invasive alien species, integrated pest management and control measures, etc.).
- Establish efficient collaboration between environmental protection, healthcare and agriculture sectors to establish mechanisms for risk assessment/risk management on LMOs, new plant varieties, including socio-economic assessments and human health risks.

Conservation best practices

- Databases, information technology, GIS mapping for combined decision-making and exchange of information (environmental protection, healthcare and agriculture sectors)
- Adopt an ecosystem approach in farming and support food-chain complexity and resistance (plants, insects, birds, mammals, etc)
- Limit the application of pesticides, herbicides, antibiotic resistance (Less application of pesticides and more biological plant protection methods).
- Control over pasture pressing over grasslands.
- Support pollinators, apiculture.
- Ecologically-friendly production

Sustainable land management

- Promote soil conservation methods: sustainable land management practices, (water conservation, protection of soil biota (including micro-organisms, invertebrates, vertebrates that contribute to maintaining soil fertility), land management planning
- Apply modern agricultural practices and agricultural techniques (crop rotation, not deep aeration, mosaic fields and crops, fertile soil conservation methods, etc.).

Resilience to climate change

- Strengthen agricultural resilience to climate change: use new plant varieties resistant to droughts and climate change
- Promote a reduction of beef consumption and production, as it is a considerable contributor greenhouse gas emissions that influence the climate change.

Organic, biological food

- Labelling motivational approach for organic food production (near protected areas), eco-traceability for food production
- Motivate (promote) organic agriculture versus LMOs

Traditional knowledge

- Support traditional agricultural knowledge and traditional practices for plant protection using biological or non-offensive methods.
- Develop traditional food and agro-ecotourism. Advertisement, education, motivational practices for small business etc.
- Traditional plant varieties and wild relatives.
- Traditional local markets
- Recognize the importance of sustainable wild harvest and trade to achieving healthcare and biodiversity conservation outcomes. This include: provision of food, nutrition, medicines, enhancing connections to nature and help maintain local/traditional knowledge.

Nutrition

- Educate healthy nutritional behavior, traditional family nutrition, old traditional and healthy receipts of food.
- Support traditional food cultures and agro-ecotourism. Advertisement, education, motivational practices for small business etc.
- Nutritional balance and behavior: more fiber and vegetables, fish food day, reduces meat consumption, seasonal food, local knowledge, control over weight and combating obesity among the children (Mexico), population.
- Promote sport, exercise, fresh air walks, tourism practices, medical consultation and supervision, reasonable additives, reduce medication and antibiotics, ...
- “Green care”, agro-farming therapy for mental disorders.
- New bread technology add fiber, ferrum, acid folic.
- Develop good practices of community gardens, school gardens.

Financial Mechanisms

- Apply motivation and compensation mechanisms.
- Financial compensatory payments for biodiversity conservation (excluding agricultural fields from agricultural activity for several years, planting wild biodiversity, etc.)

Education

Breakout Group 3- Urban development and greenspace

Country Lead: Melissa Marselle (Germany)

Ressource persons: Conor Kretsch, Matthias Braubach

This also reflects the ENCA recommendations presented by Germany and distributed to participants

Key elements to be included in a joint activity on biodiversity and health

During our discussions it was clear that the format and constitution of any initiative or joint programme of work on health and biodiversity for urban planning / development and greenspace will be specific to any given location (e.g. whether it is led by a national government agency or co-ordinated at a lower-level such as an urban planning authority), and whether it is formally prescribed by legislation, or informally recommended by policy, will be a feature of the political and social norms of a given country, region or locality and therefore prescribing any universally-applicable modes of practice or content for consideration is very difficult.

We therefore aimed to highlight key features which any general policy framework for a multi-stakeholder initiative on urban health and biodiversity should include, in order to facilitate an inter-disciplinary / inter-sectoral approach, ensuring appropriate consideration of important themes arising from the relevant stakeholders, and ensuring accountability for implementation.

The general features such a plan should include are:

1. It should establish a joint working group on health and biodiversity as part of the urban / greenspace development (or management) authority.
2. It should ensure that all relevant stakeholders are included, with due regard given to the perspectives of different cultural and social groups, the private sector and civil society organisations.
3. It should establish a framework for communication and interaction between those stakeholders, to ensure exchange of knowledge, experience and ideas.
4. It should seek to identify specific sectoral priorities (i.e. from health, biodiversity, and other inter-connected sectors including agriculture, water management, transport etc., as well as community needs)
5. It should aim to then identify linkages between those priorities (e.g. cross-cutting issues linking health and biodiversity in the specific spatial context) in order to pinpoint actions which will provide co-benefits. This can be assisted by including background information and evidence on a set of indicative thematic areas, e.g. based on topics on the CBD-WHO State of Knowledge review, local / national / regional research or experiences of other localities, etc. (this can cover themes such as urban infectious disease, social and cultural well-being, nutrition security, mental health and physical fitness, etc.)
6. It should commend a set of tools or mechanisms (e.g. impact assessment and strategic assessment methodologies and other toolkits) which may support decision making.
7. It should ensure that the initiative has sufficient technical and technological capacity to address the relevant issues, e.g.. it should be supported by expert opinion where necessary.
8. It should produce an action plan that assigns specific responsibilities for implementation, and which is time-limited.
9. It should define a set of appropriate indicators, perhaps in the frame of the SDGs, to monitor and measure progress and ensure transparency.
10. It should communicate its actions on biodiversity and health to the general public to inform them of the health benefits of biodiversity and greenspace.

Actions for biodiversity and health, as a matter of urgency**1. Immediate actions**

- a) **Increase awareness of the human health and wellbeing effects of natural environments and biodiversity.** This can be achieved by:
- Consolidating the existing research on the health benefits of nature, and the health effects of biodiversity. Highlighting the differences of these effects according to socio-demographical status of the recipients.
 - Emphasizing the contribution of biodiversity in tackling our main health problems; demonstrating the facts and synergies regarding the benefits and risks to health.
 - Tailoring communication of the health benefits of nature and biodiversity to the interests of different stakeholders, practitioners, and policy-makers.
 - Using social media and other platforms to communicate and disseminate simple messages about the health benefits of biodiversity. Working with environmental charities to disseminate these messages to larger audiences.
- b) **Highlight the co-benefits of nature-based solutions for climate change adaptation to policy-makers and regional planning authorities.**

Nature-based solutions for climate change adaptation provide multiple co-benefits for human health, biodiversity, and climate change. These co-benefits need to be emphasized to policy-makers, politicians, and regional planning authorities. This can be achieved by:

- Highlighting the interlinkages of climate change, human health and biodiversity by emphasizing that there are direct (e.g. heat stress) as well as indirect (e.g. spread of vector-borne diseases and allergenic plants) negative impacts of climate change on health and biodiversity, but also promoting the potential health effects of nature based solutions to climate change adaptation.
 - Focusing on human health and wellbeing as a *central benefit* of nature-based solutions for climate change adaption (instead of a co-benefit).
 - Emphasizing the *co-benefits* nature-based solutions for climate change adaptation have for the preservation of ecosystem services and biodiversity conservation.
 - Highlighting the potential of nature-based solutions to climate change adaptation to addressing social health inequalities in terms of reducing climate change susceptibility.
 - Linking Green Infrastructure strategies and/or climate change adaptation strategies to other policies, such as the Healthy City strategy.
- c) **Effectively design and manage green spaces to ensure people have contact with nature and biodiversity**

This can be achieved by:

- Using both land sparing and land sharing approaches, e.g. fostering wildlife both in parks or conservation areas as well as in the urban matrix, to provide opportunities for people to interact with nature and obtain its health benefits.

- Managing small urban green spaces to increase the aspects of biodiversity that can be beneficial to human health and wellbeing. It is important for people to have contact with natural environments in their daily life (e.g. on their ways to school or work, around the home).
- Designing larger green spaces and establishing “green corridors” from urban green spaces to rural protected areas to create additional opportunities for recreation and restoration.
- Utilizing social and physical interventions to facilitate use, and improve the quality of, green spaces. Access to green space does not necessarily result in its use.
- Focusing interventions on increasing both the biodiversity of the green space, and the amount of time people spend in that green space. Both have been shown to achieve positive health and wellbeing benefits.
- Marketing protected areas as “health hubs” in order to highlight the value they deliver for human health and wellbeing.

2. Medium term actions (2-5 years)

a) Increase the evidence base of the contributions of biodiversity for human health and wellbeing.

This can be achieved by:

- Identifying which aspects of biodiversity can provide benefits for physical, psychological and social health and wellbeing.
- Examining how biodiversity benefits health and wellbeing.
- Understanding how socio-demographical status modifies biodiversity’s effect on health and wellbeing.
- Investigating the human health and wellbeing effects of current biodiversity loss and reduced access to natural environments.
- Investigating the potential negative effects of biodiversity on human health and wellbeing, such as vector-borne diseases and allergenic plants. Identify appropriate management measures to reduce these negative health impacts.
- Investigating the ‘dose’ of biodiversity required for a positive health effect. How much biodiversity is necessary for human health and wellbeing?
- Conducting economic evaluations of biodiversity and human health interventions.
- Developing a standardized monitoring scheme to estimate the health and well-being benefits of the protected area network.

b) Training to other sectors on the health benefits of greenspace and biodiversity

- Developing guidance for park managers, and landscape architects, and urban planners and designers describing the key features of biodiversity required for increased health and wellbeing.
- Developing guidance for health professionals on how to use natural environments for health promotion as a complement to other already established measures.
- Training for trainee physicians (GPs) on the health benefits of natural environments

- Education about biodiversity and health into school curriculum, starting with kindergarten forest schools, primary school through to secondary school.
- Training to urban designers and planners on the Environmental Health Assessment Tool (this may involve continued professional development).

c) **Foster application of nature-based solutions for climate change adaptation from society and policy**

This can be achieved by:

- Understanding what practitioners and policy-makers require in order to implement the research on biodiversity and health. What are the barriers? What kind of tools, guidance, or processes need to be created?
- Developing a “common language” to facilitate understanding and cross-sectoral collaboration.
- Demonstrating successful interventions or projects using case studies to where cross-sector working led to cost-effective and efficient delivery of ecosystem services that provided multiple benefits.
- Building ownership, cooperation and collaboration on biodiversity, health and climate change issues between the different stakeholders. A co-designed framework plan is likely to be the most successful.
- Developing integrated tools of analysis and metrics that bring together the different disciplines, sectors and areas of expertise. Existing decision-making process tools may be useful starting points, e.g. Environmental Impact Assessment and Health Impact Assessment.
- Creating “Sustainable Development Goal-type” indicators to monitor process, success and sustainability, and to provide focus.
- Implementing robust monitoring and evaluation of the effect of nature-based solutions on climate change adaption, human health and wellbeing, biodiversity, and ecosystem services.

3. Long-term actions (6-8 years)

- a) Continued monitoring and evaluation of green space interventions
- b) Mainstreaming biodiversity and health actions
- c) Health insurance companies facilitate use of nature for health prevention and recovery.

APPENDIX 1



Convention on
Biological Diversity



World Health
Organization



**PROGRAMME - REGIONAL WORKSHOP ON THE LINKAGES BETWEEN BIODIVERSITY
AND HEALTH IN THE EUROPEAN REGION**

Date and time	Session/activity
Monday, 23 October 2017	
9 – 9.30 a.m.	Item 1. Opening keynote statements <ul style="list-style-type: none"> • Opening of the workshop by H.E Mr. Kimmo Tiilikainen, Minister of the Environment, Energy and Housing, Finland • Introductory statement from Dr. Tedros Adhanom Ghebreyesus, Director General, World Health Organization • Ambassador of Mexico to Finland, H.E. Mr. Ernesto Céspedes • Context, workshop objectives and expected outcomes, Dr. David Cooper, Deputy Executive Secretary, Secretariat for the Convention on Biological Diversity
9.30 – 10:15 a.m.	Item 2. Overview of biodiversity and health linkages and mainstreaming <ul style="list-style-type: none"> • Joint presentation by the WHO and CBD Secretariat, <i>Connecting Global Priorities: Biodiversity and Human Health</i>, Ms. Cristina Romanelli • The Rockefeller Foundation Lancet Commission Report on Planetary Health, Prof. Andy Haines, London School of Hygiene and Tropical Medicine • Health and Environment considerations in the WHO Europe region, Dr. Matthias Braubach, WHO regional office for Europe
10.15 – 10.30 a.m.	Coffee/tea break

Date and time	Session/activity
10.30 a.m. – 12.30 p.m.	<p>Item 3. Advancing co-benefits between health and biodiversity and collaborative best practices</p> <ul style="list-style-type: none"> • Human microbiome and exposure to microbial diversity in the environment, Dr. Eeva Furman, Finnish Environment Institute and Prof. Graham Rook, University College London, UK • Biodiversity and health for food security and nutrition, Ms. Lina Mahy, World Health Organization • Zoonotic and vector-borne diseases and One Health, Prof. Richard Koch, Royal Veterinary College, UK • Community Health: health and environment challenges and opportunities for Indigenous Saami Peoples, Mr. Bent-Martin Eliassen, Saami Council, Norway • Biocultural diversity and mental health Mr. Conor Kretsch, COHAB Initiative • Promoting ecosystem and human health in urban landscapes, Dr. Aletta Bonn, German Centre for Integrative Biodiversity Research
12.30 – 1.45 p.m.	Group Photo followed by Lunch break
1.45 – 3.15 p.m.	<p>Item 4. International cooperation and support networks for health and biodiversity mainstreaming</p> <ul style="list-style-type: none"> • Biodiversity and Health and the Future Earth, Health Knowledge Action Network, Prof. Dr. Kari Raivio, Emeritus Chancellor of the University of Helsinki • Mainstreaming biodiversity and health linkages in the European Union, Ms. Karin Zaunberger, European Commission, Directorate for the Environment • Building resilience for health systems in disaster risk reduction, Ms. Chadia Wannous, United Nations Office for Disaster Risk Reduction (UNISDR) • Human Health and Biodiversity Conservation through Sustainable Trade in Wild Plants, Ms. Teresa Mulliken, TRAFFIC International • The IUCN Red List of Ecosystems, Ms. Rebecca M. Miller, IUCN Global Ecosystem Management Programme
3.15 – 3.30 p.m.	Coffee/Tea break
3.30 – 5.30 p.m.	<p>Open discussion and Q&A</p> <ul style="list-style-type: none"> • Open discussion with participants on workshop objectives and expected outcomes, to be chaired and moderated by the CBD Secretariat. • Questions and answers/points of clarification with expert panel
6.00 p.m.	Welcome reception by host country, Finland
Tuesday, 24 October 2017	

Date and time	Session/activity
9 – 10.00 a.m.	<ul style="list-style-type: none"> • Overview of days 2 and 3 workshop objectives and expected outcomes • Self-introductions by country participants • Preliminary discussion based on questions from background document on biodiversity and health <ul style="list-style-type: none"> ○ Reporting processes under CBD-WHO joint work programme, relevant European WHO processes, and other relevant instruments
10 – 10.15 a.m.	Coffee/Tea break
10.15 – 11.30 a.m.	<p>Item 5. National cross-sectoral perspectives and experiences on the integration of biodiversity and health linkages</p> <ul style="list-style-type: none"> • All country representatives will be invited to make a 5-7 minute presentation based on their national experiences. Power Point presentations are welcome but optional. Where there are two country representatives (from the health and biodiversity-related sector respectively, joint presentations are encouraged, where possible, but they can also be presented separately as needed). This is an opportunity for country representatives to highlight any best practices and related cooperation initiatives emphasizing, where possible, main outcomes, experience gained and lessons learned
11.30 a.m. – 12.20 p.m.	<p>Guided “Healthy Walk in Nature” Tour, guided by Mr. Olli Manninen, Finnish Association for Nature Conservation and Mr. Jukka-Pekka Jäppinen, Finnish Environment Institute</p>
12.20 – 1.15 p.m.	Lunch Break
1.15 – 3.00 p.m.	<p>Item 5. National cross-sectoral perspectives and experiences on the integration of biodiversity and health linkages</p> <ul style="list-style-type: none"> • All country representatives will be invited to make a 5-7 minute presentation based on their national experiences. Power Point presentations are welcome but optional. Where there are two country representatives (from the health and biodiversity-related sector respectively, joint presentations are encouraged, where possible, but they can also be presented separately as needed). This is an opportunity for country representatives to highlight any best practices and related cooperation initiatives emphasizing, where possible, main outcomes, experience gained and lessons learned (<i>Continued</i>). <p><i>Note:</i> As per above, country representatives will be invited to make their short presentations by country and in alphabetical order.</p>
3.00 – 3.15 p.m.	Coffee/Tea break
3.15 – 5.30 p.m.	<p>Item 6. Key opportunities and challenges for mainstreaming biodiversity and health linkages in research, policy and practice</p> <ul style="list-style-type: none"> • Expert presentations <ul style="list-style-type: none"> ○ Massive Open Online Course, Dr. Rafael Luis de Castaneda, University of Geneva • Breakout groups on strategic steps to advance cross-sectoral cooperation for the conservation and sustainable use of biodiversity while maximizing human health gains in the region.

Date and time	Session/activity
Wednesday, 25 October 2017	
9 – 10.15 a.m.	<ul style="list-style-type: none"> • Brief recap of Day 2 (CBD & WHO) Item 7. Policy options and strategies for a more integrated approach to health and biodiversity and workshop conclusions <ul style="list-style-type: none"> • Breakout group discussions based on themes raised in previous presentations by experts and breakout groups (under item 6, continued as needed.) • Group discussion on required national capacities for the integration of biodiversity and health linkages in national biodiversity strategies and action plans, national health plans and other relevant reporting instruments. • Plenary group discussion to be chaired and moderated by CBD and WHO
10.15 – 10.30 a.m.	Coffee/Tea break
10.30.m. – 12.30 p.m.	<ul style="list-style-type: none"> • Keynote presentation: Zoonotic and vector-borne diseases in Europe, Dr. Jonathan Suk, European Centre for Disease Control • Expert presentation: Building inclusive communities of practice for One Health, Dr. Hans Keune, Belgian Biodiversity Institute • Initial discussion on workshop conclusions and recommendations <ul style="list-style-type: none"> ○ Group discussions on how biodiversity and health linkages can be strengthened to respond more effectively to the needs and priorities of countries in the region. • Plenary discussion to be chaired and moderated by CBD Secretariat and WHO
12.30 – 1.30 p.m.	Lunch Break
1.30 – 3.00 p.m.	<ul style="list-style-type: none"> • Discussion on workshop conclusions and recommendations (continued) • Final reporting on outcomes of breakout sessions • Plenary discussion to be chaired and moderated by CBD representative
3.00 – 3.30 p.m.	<ul style="list-style-type: none"> • Closing Remarks, H.E. Pirkko Mattila, Minister of Health and Social Affairs, Finland
3.30 – 3.45 p.m.	Coffee/Tea break
3.45 – 5.00 p.m.	<ul style="list-style-type: none"> • Final discussion and adoption of workshop conclusions and recommendations • Closing remarks by the Secretariat of the Convention on Biological Diversity and World Health Organization • Closing of the regional workshop
Thursday, 26 October 2017	

Date and time	Session/activity
8.30 a.m.	Half-day Field Trip to Vallisaari Island hosted by Parks and Wildlife Finland and Ministry of Agriculture, Finland (optional) <ul style="list-style-type: none">• Bus picks up participants from the conference venue Hotel Rantapuisto http://www.nationalparks.fi/en/vallisaari?inheritRedirect=true http://www.po-ruski.nationalparks.fi/ru/vallisaari?inheritRedirect=true
11.30 p.m.	Tour ends and boat tour returns to Helsinki city centre

