NATURE HEALTH BENEFITS SESSION

This is a report of the session on Nature Health Benefits that took place on 6th October 2016 in Brussels, in the framework of the European OneHealth/EcoHealth workshop organised by the Belgian Community of Practice Biodiversity & Health which is facilitated by the Belgian Biodiversity Platform

Authors: Sjerp de Vries, Julie Garnier, Hans Keune, Timo Assmuth, Xianwen Chen, Katriina Kilpi, Simon Rüegg, Sofie Vandewoestijne

INTRODUCTION

Nature benefits human health in many ways as the structure, notably biodiversity, and functions of nature underpin the provision of ecosystem goods and services such as food, air, energy, water, shelter, medicines, disease prevention and treatment, disaster-risk reduction and climate regulation. Often either the health benefits side is getting no or only limited attention in expert communities focusing on environment and health, or the health risks side is neglected. Experts in the *OneHealth* communities tend to focus on health risks like vector-borne and other infectious diseases. Experts in the ecosystem services community tend to focus on the services, such as health benefits from urban green space or medicinal plants. In the original *OneHealth* and *EcoHealth* frameworks, such health benefits from nature are hardly taken into account.

During the *European One Health/EcoHealth Workshop*, a session on Nature's health benefits was organised to not only illustrate the importance and diversity of benefits that nature contribute to health, but also the many challenges that practitioners, researchers, policy makers, and stakeholders face in public and ecosystem health. A total of 11 presentations and five posters were given during the session, covering the following main topics: (1) health benefits of green spaces and protected areas in and around urbanised centres in Europe, (2) update on biodiversity objectives for Belgium, (3) biodiversity as a source of medicinal plants and as a source of food, and (4) benefits of using a gender-sensitive approach to *One Health* to conserve biodiversity.

PRESENTATIONS

Xianwen Chen presenting

Chantal Shalukoma listening to presentations

In order to demonstrate the health and social benefits of green spaces in and around urbanised centres in Europe, results from a very comprehensive study (P. Ten Brink) on the *Health and Social Benefits of Biodiversity and Nature Protection* were presented. By analysing the role of *Natura 2000* and protected areas in and around highly urbanised areas in addressing a range of health and social issues, the study identified that exposure to green spaces had multiple positive health impacts through the reduction of air and noise pollution, the mitigation of heat stress, the reduction of stress and recovery from stress-related disorders, the support of children's development as well as the promotion of social cohesion especially in minority groups.

These findings were corroborated by results of the *PHENOTYPE* project (P. van den Hazel) conducted across four European regions which explored the preventive and therapeutic effects of exposure to natural environment and green areas for different population groups. The study identified that increased time spent in natural environments led to higher mental health scores and improved cognitive function as well as a higher frequency of social contacts, while it also decreased negative pregnancy outcome such as low birth weight and depressive symptoms. Both studies showed the importance of integrating nature and human health needs into land use planning for realising health and social benefits.

Exploring the possible pathways linking nearby nature to human health in highly urbanized countries, S. De Vries presented findings about some aspects of nature which are important for generating health benefits, such as nearness and accessibility, contact, recreational quality and social safety, and how specifically important these impacts were for children, the elderly and in deprived neighbourhoods. In an attempt to quantify human exposure to biodiversity, it was proposed to use a new measure, the CADD *(Cumulative Alpha Diversity Dose)* which integrates biodiversity over space and time and seems more adapted to the fact that perceived biodiversity has been found to be a more appropriate measure for exposure to nature in relation to mental health, (R. Aerts; poster). The session also presented two studies which have just been initiated in Belgium: the Respirit project which will analyse the drivers of allergic symptoms and how biodiversity affects allergenicity *(R. Aerts et al)* and the GRESP-H project in Belgium which will assess the effects of living in/close to a green/blue area on mortality and morbidity in Belgium at different stages of life *(M. Bauwelinck)*.

Another practical case illustrating the benefits of bringing nature into cities was provided by B. Ambrose-Oji et al. *(poster)* who presented wellbeing impacts of learning opportunities

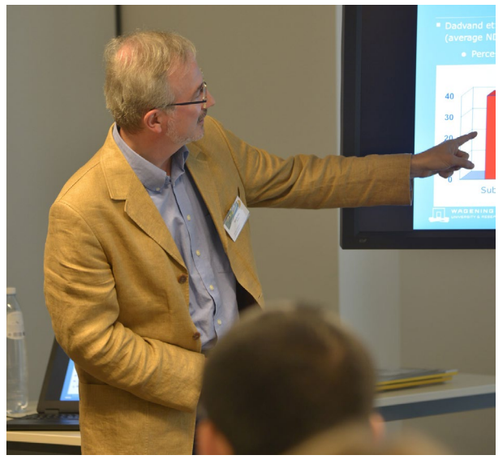
about cultivation and conservation of wild flowers for the disadvantaged youth in the UK.

An update of biodiversity conservation objectives in Belgium was reviewed by M. Schlesser *(poster)* with the *Biodiversity 2020, Update of Belgium National Strategy*.

A systematic literature review of urban nature's health effects and monetary valuation (X. Chen) showed that the number of studies presenting such monetary values was in fact limited. Specific studies, which have evaluated monetary values of the impacts of nature on birth weight, ADHD, attention restoration and school performance, reduced air pollution and related health illnesses and mortality, and reduced agitation and aggressive behaviours among dementia patients, were reviewed. Future research needs and challenges were discussed.

While the above presentations looked at specific nature health benefits, T. Assmuth presented the multi-dimensional aspects of health in relation with the environment. Nature benefits to health need to be promoted even when causal relations are not perfectly known as they are some obvious fundamental benefits of nature, including the fact that we cannot live without nature and that parts of nature depend on us, and that nature generates important co-benefits such as productivity and happiness. However, benefits are constrained by risks from natural and semi-natural agents and by costs from managing these risks, and both of these are constrained by information. Since risks and benefits are embedded into each other, nature could be conceived as some form of health insurance. In characterizing benefits and risks it is important to use quality criteria involving defined socio-economic and psychological models and communities of practice, and to balance evidence-based and proactive, also intuitive approaches.

In the context of developing countries and the provision of medicinal plants which are used for



Sjerp De Vries presenting

Timo Assmuth presenting

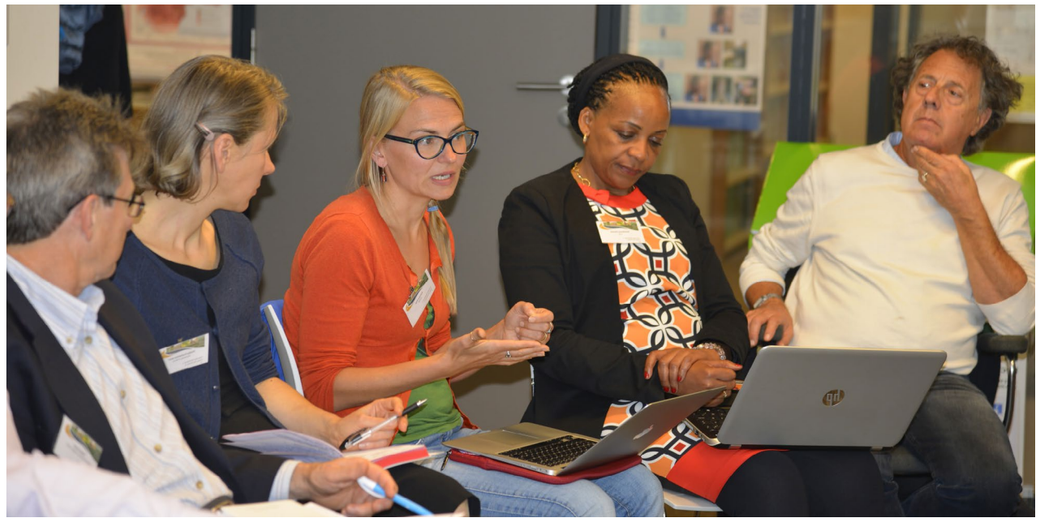
primary health care by 70-95% of the population in Africa, Asia, Latin America, and Middle East, P. Van Damme presented a number of examples from the tropics to analyse growing markets for such products. Main strengths include a very positive attitude of the public and the state towards their use and the ancient origin of such knowledge which is deeply rooted in the culture. Main weaknesses included their over-exploitation, lack of a legal framework, and lack of infrastructure and of data leading to the frequent production of products contaminated with toxics. With the growing green market and scientific research now trying to integrate the use of medicinal plants into modern healthcare, development opportunities exist and WHO is working on developing international guidelines. Furthermore, there is a need to develop protective mechanisms against overexploitation, extra-legal markets and bio-piracy.

Challenges and threats associated with the use of traditional medicine and their integration into modern healthcare was further illustrated by a presentation on the project PhytoKat in Democratic Republic Congo (DRC) where a study on anti-diabetic plants enabled to identify the active compounds *(B. Amuri et al.)*. The study

highlighted the need to preserve the traditional knowledge of traditional healers and the ecosystem while improving the quality of herbal medicines. Another study *(C. Shalukoma et al.)* conducted on plants used by traditional healer near Kahuzi-Biega National Park in DRC identified that different degrees of specialization depending on their geographical location and found that nearly half of forest species collected by traditional healers were also consumed by lowland gorillas, raising the question as to who were learning from whom. Even in Europe and more specifically in Brussels, a study presented by *V. Povilaityte-Petri and P. Duez* revealed that medicinal plants were largely used in multidisciplinary urban greening projects in Brussels.

The provision of food is another major ecosystem service of biodiversity, which was highlighted by a study on traditional foods of plant and animal origin in Ecuador. Results indicated that diets of indigenous women were mainly based on traditional foods and met recommendations for a healthy diet *(D. Penafiel et al.)*. Benefits of a gender-sensitive *One Health* approach for biodiversity conservation in developing countries were described by *J. Garnier and R. Kock*. After highlighting the limitations of current biodiversity conservation strategies, a case study of coastal conservation in Mozambique was used to illustrate the pivotal role played by women in resource use and poverty alleviation. Key to the success of such an integrated conservation programme was the restoration of local community's management rights to use and protect their resource base.

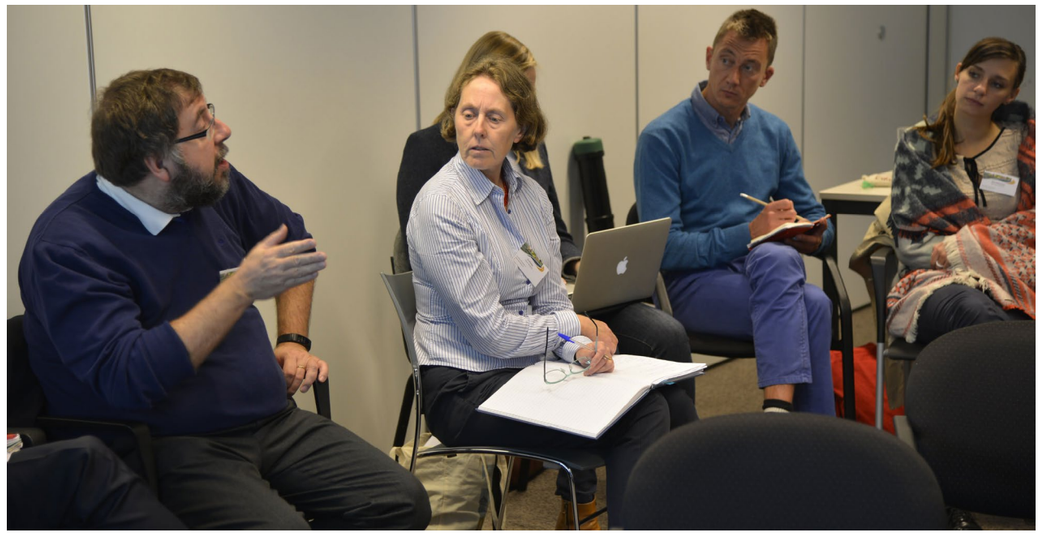
DISCUSSIONS



Katriina Kilpi speaking during the discussion

Prior to the workshop, some important discussion points had already emerged, following a request sent to all participants to express what they considered as the main challenges regarding implementation of a broader integrative or collaborative framework into practice. Answers to this question are presented in ***Table 1*** in the Annex and could be expressed through the following challenging statements and questions:

- Requirements for evidence on the positive health effects of nature are higher than those for the absence of negative health effects of some possible pollutants. The latter get the benefit of the doubt, while the first do not.
- *"Health in all policies"* is not a helpful slogan if not integrated across these policies.
- Which forms of *(scientific and other)* expertise participants do not have collaborative experience with yet, but



Pierre Duez speaking during the discussion

could be considered useful and why? In other words, what are the gaps in tackling topical problems? How could the relevant collaborative capacity be created?

• Monetisation of health benefits of nature is one way forward to create an evidence base for decision makers and to be taken seriously by policy makers.

• Creating a demand for environmental health practice is another essential way forward.

• Since the benefits of ecosystem services are scattered over different sectors and stakeholders, sectorial costs-benefit analyses are likely to underestimate the total benefit an ecosystem generates.

• Research on the health effects of nature from the health perspective tends to focus on a different set of ecosystems than that from an ecosystem services perspective: (peri-)urban ecosystems versus high biodiversity/protected area ecosystems

The discussion started with the first point focusing on the evidence challenge and then shifted to the question of the expression/ valuation of nature health benefits, especially in monetary terms. Quite early in the discussion it appeared that such information was required by policy makers who argued that no strategy could be adopted without strong evidence.

Regarding evidence on health effects it was appreciated in the discussion as well as in the presentations that many uncertainties are involved in establishing causal links between putative health benefits and engagement with nature as well as between putative harmful health effects and risk factors. The kind of uncertainties differs so that the statement above, i.e. that requirement for evidence on benefits would always trump that on risk, is simplistic. Some claims for cures may be bought into due to public, political or commercial interests as easily as claims for risks.

Importantly, it was stressed that while improved evidence is needed, proactive interventions on both perceived benefits and risks are needed as well. It is a social learning task to balance these approaches especially as different notions of health *(of human and non-human entities)* and traditions on evidence are involved, e.g. so that also the evidence on available intervention options and their consequences is used well.

Economic valuation translates health benefits into terms that policy makers and other decision makers *(business, households)* can use and understand but the actual number of studies where the positive effects of nature are translated in monetary terms is limited. Decisions by both society and policy often revolve around monetary considerations. Because current socio-political systems emphasise monetary valuation, and apply it to support decision-making regarding policy alternatives, it is highly useful to translate health benefits of nature into monetary terms to get people's attention. This in turn requires good communication skills

to raise awareness from other stakeholders. Monetisation is also not sufficient. A clear demand from society is also necessary. This could be generated by local initiatives *(discussed below)*. However, the majority of participants argued that monetary valuation is limited and potentially dangerous. The benefits that are not accounted for tend to be ignored when they are abundant, while we usually start to valuate things when they are traded because they have already become scarce *(e.g. the TEEB initiative is a result of awareness that the ecosystem services are being depleted)*. Moreover, unknown effects on health from nature, society and economy as complex systems cannot be considered in this decision model, for obvious reasons.

Consequently, decisions based on monetary valuation will inevitably be ignorant of at least part of their consequences. With the complexity of natural, social and economic systems and the potentially irreversible damage and loss that can occur, monetary valuation is inadequate and might only be activated once it is already too late. The example of how in the UK this debate developed for forestry was given to illustrate such limitations. Initially the policy debate focused on monetary valuation of health benefits and then shifted to a broader more health focused valuation. However it recently shifted back to a main focus on monetary valuation in the framework of the general trend to capture all values in natural capital accounting. Another weakness of economic valuation is that it needs to be used with caution as values which are estimated in a specific context at a specific time under specific assumptions can be easily misused under other contexts.

The notion that ecosystems products which are fundamental to health such as air, water, soil and energy, should become basic rights, was also proposed. Their removal from the capitalistic market systems and fair distribution would promote social equity but current trends are actually going in the opposite direction. Some

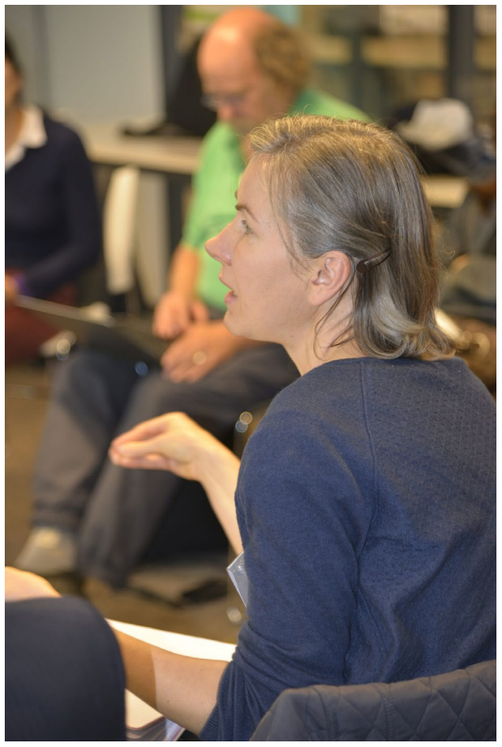
participants challenged the need for *One Health* to be governed through national or international large scale governmental systems which are actually taking us to a down path. As an option to bypass dysfunctional political systems, it was proposed to govern *One Health* through a perspective of local processes and governance, using available technologies and tools which would invent new systems of health governance and bring health right back into its local and also more general social value. Rooting decisions through such entirely novel methods would then allow people to be in charge of their own health and to make informed decision as to their environmental set up. Rather than delegating decisions to powerful individuals in agencies, this model would rely on crowd decision making. The success of some local and grassroots initiatives which are adapted to a local context was highlighted to illustrate this concept. Engaging with such initiatives was proposed as a practical way to provide evidence on nature's health benefits and as an opportunity to develop higher level experiments and co-evolution models. City-level projects which are investing in new tools, noise maps, air pollution maps etc. could be coupled with smart city projects such as the use of mobile exposure collectors by volunteers who build their own biosensors and collect their own pollution data on which to base their decision. Ultimately, such initiatives raise awareness on nature's health benefits by involving people and by giving them the right to make a choice based on their own health data. The strength of the grassroots citizen science projects is that they are run by intrinsically motivated groups with local knowledge, who can produce a tailored solution that is more likely to fit the local public better than a solution produced externally. The same focus on local conditions can also be their weakness as it limits their resources and networks and force other projects reinvent the wheel. Therefore, possibilities to collaborate with ongoing existing grassroots initiatives could turn out useful for *One Health* community as well the grassroots initiatives

in terms of cross-fertilisation, knowledge sharing and improved funding opportunities. The importance of education at all levels was also advocated as a tool to promote the *One Health* concept. It was suggested that all *One Health* scientists and practitioners – starting with all participants of the workshop – should raise awareness around them through their existing networks. Starting the education process early with children would also allow society to start developing different value systems.

Finally, some participants suggested that we do not necessarily need to find arguments relating to health to conserve nature, and that nature should just be enjoyed and protected. This relates to the above discussion on the kinds of values of nature and of health that are deemed important, including intangible values such as ethical values. In line with this, at a national level, strong commitments to give rights to nature have been made in some countries through constitutional changes that capture the intrinsic value of nature. In 2008, the Ecuadorian government added that *"life forms have a right to exist"* in its constitution and a river actually took the Ecuadorian state to court for mercury pollution, and won. New Zealand has also shown a similar commitment.

A line of thought challenging this *'intrinsic rights'* perspective is to consider that on the one hand the European continent has been completely depleted of its original natural coverage to provide the resources for the current civilisation, i.e. there is not one primary forest left in the whole Mediterranean basin. On the other hand, human cultivation of alpine pastures has given rise to new species that are now endangered, because of the change of land use.

What can we conclude from these examples? Humanity has and will keep changing the environment - where humans are, no original nature remains. However, human interventions also create new ecological niches, e.g. alpine pastures or sterile surfaces in hospitals. These will inevitably be colonised by new species that evolve to occupy free spaces. One could argue that through the more effective human intervention in nature in present time, one can shift the narrative away from intervention yes/no *(urbanisation/ nature reserve)* to how do we intervene in the future. The importance of educators in the *One Health* can be considered here. While we teach children to protect nature, we teach them the passive way of interacting with nature, which is also not the goal. Balance in conserving and experiencing could be sought further. On the other hand, all hope should not be put on the children, as the adult footprints make a big difference in nature conservation currently.



Vitalija Povilaityte-Petri speaking during the discussion

CONCLUSIONS

In summary, the main points that came out of the discussion are:

- Given the current socio-political context, policy makers use valuation to prioritize and make choices given budget constraints.
- Economic valuation of complex systems, including nature, society, economy and health, as a basis for decision making is dangerous as:

  -It will not capture the complexity of natural systems.

  -Aspects which are not taken into account tend to be ignored.

  -We usually start to valuate things when they are becoming scarce, which may be too late in the case of nature.

  -It will lower the intrinsic value of nature and society in people's mind.

  -Nevertheless, economic valuation of health benefits from engaging with nature, as well as attempts to prove and quantify the effects that might generate such value, can be useful points of departure for discussion with policy makers and others concerned on what they and others value and why, and how different also conflicting values could best be reconciled. Thus, evaluation with its limitations can be a heuristic tool in a process of dialogue and deliberation, especially when the limitations are explicated.

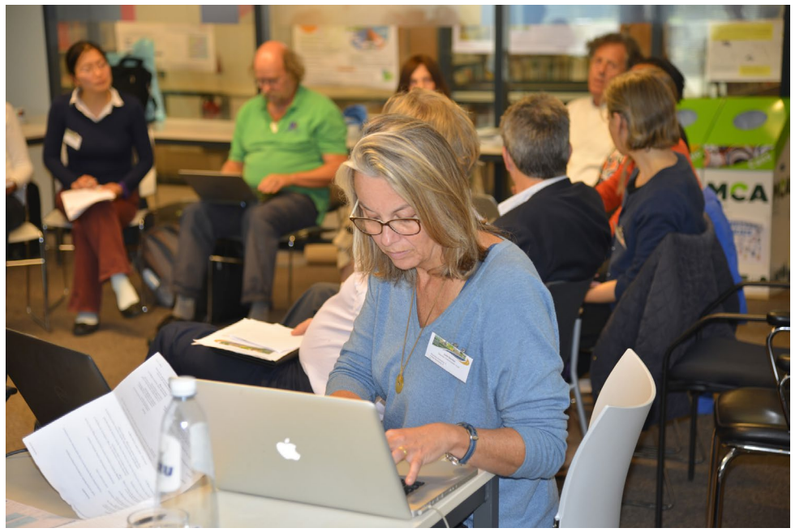
  -Several participants pointed out a *'deliberative middle road'* between the perils and benefits of economic valuation. This would then allow e.g. discussion on whose benefits and costs/risks are to be accounted for and how *(i.e. the justice aspect)*. This can be seen in parallel to other approaches to quantification.

Some ways forward have been proposed:

- Some grassroots initiatives have been successful because they are adapted to the local context and therefore need to be promoted.

  -May be not possible to scale up, e.g. to national and international scales.

- Smart cities experiments as living labs *(outside national systems)*.
- The *One Health* community should show the way / educate around it.
- The *One Health* community needs to communicate in a language that is understood by all stakeholders.
- We need to consider possible use of impactful communication methods.
- A reform in education of all age groups, especially children, is required to make them value nature.
- May governments adapt the constitution, e.g. as happened in Ecuador and New Zealand, to conserve nature and biodiversity?



Julie Garnier working on the session report

ANNEX

Table 1 lists the preparatory discussion points, which were raised by participants after being asked to answer the following question prior to the workshop: *"Our session Nature Health Benefits focuses on the benefits from nature for human health. We want to discuss this in the framework of OneHealth, EcoHealth and other broader integrative or collaborative frameworks. Based on your work experiences, what would be the main challenge for you to discuss in our session regarding implementation of these broader integrative or collaborative frameworks into practice? Please formulate this as concise as possible in order to allow us to take it up pragmatically in our discussion."*

Participant	Challenges raised
P. ten Brinck	1: What constitutes appropriate evidence and sufficient proof - as practical cases in complex ecosystems will not be able to meet conditions expected within laboratory trials? 2: How can the multiple benefits be perceived as a whole, when stakeholders will focus on the benefits that relate to their objectives, jurisdiction or mandate?
P. van den Hazel	The perception of the public on green and health in urban settings displays a range of responses. Other stakeholders have other perceptions. The integration of these perceptions are crucial for realising health benefits.
D. Vandenbussche	Which type of information governmental health services need to decide for themselves whether to invest in green/nature (or the experience of it) for health benefits?
T. Assmuth	How to frame and substantiate the health benefits from nature, including the multiple also indirect and intangible and in many cases self-evident and intuitive co-benefits, but also losses due to health impairment through nature (such as by notably vector-borne diseases in the One Health context). The related key operational challenge is one of multi-dimensional, inter-sector and inter-actor evaluation and proactive deliberation that combines quantification and evidence (e.g. on measurable benefits, losses and outcomes of interventions) with other types of indications and values, also qualitative, and with political goals
X. Chen	One Health is a broader framework than EcoHealth. OneHealth aims to incorporate all aspects of health, whilst EcoHealth studies specifically the interface between ecology and health. The main challenge will be how EcoHealth and One Health, both of which are great initiatives, can work together.
R. Aerts	Collection and processing individual spatial data (exp to nature) and individual real-time health data (mobile health data)
R. Kock	The biggest challenge is to shift away from anthropocentricity in all actions and activities of the greater body of society. The biggest beneficiary in the short term of One Health would be environment and nature and ultimately all of life including humans.
M. Schlesser	Elders should be included in the system and be considered as targets for communication since they can spend significant time with grand-children and therefore play an important role in education and initiation of children to nature, gardening, healthy food... When you fall in love with nature early, you become "biofile" for all your life. This type of involvement of grandparents in knowledge transmission and re-connexion to nature is also source of joy and well-being for themselves
C. Shalukoma	The main challenge that we would like to discuss in the session is about how to consider the value and the conservation issues of medecinal plants, especially those used by specialists healers and great apes, while the science doesn't progress enough on the proof of their phytochemical components
V. Povilaityte-Petri	I would suggest to develop holistic discussion concerning medicinal plants resources and their sustainable use: 1. What is status quo for biodiversity of medicinal plants (records and documentation of existing genetic resources, how is it researched, documented and analysed in different EU countries)? 2. What are the driving forces/motivations to use medicinal plants and their products (herbal medicines, food supplements, medical devices) in human medicine and veterinary practices? 3. How it relates to current existing ethnobotanical/ethnopharmacological knowledge of professionals and general public? How this knowledge is being developed/being made available and by whom in response of growing public interest in medicinal plants? 4. What are the medical practices/systems that support and provide professional guidance in use of medicinal plants products (what are the challenges and difficulties of complementary and alternative medicine (CAM) concerning herbal products? 5. What do we know about the quantities of wasted medicinal plants and their products? Is our use of medicinal plants and their products sustainable?

Videos and presentations accessible at:
http://www.biodiversity.be/health/58