

# **THEME: Forests and Health: Forests as a resource and a potential solution to human health**

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# Overview of the presentation

- ▶ Definition of terms
- ▶ Background
- ▶ Benefits
- ▶ Challenges
- ▶ Solutions
- ▶ Conclusion

# Key definitions

- ▶ **Forest:** A forest is an area of land dominated by trees
- ▶ **A tree,** woody plant that regularly renews its growth (perennial).
- ▶ **Resource:** noun a source of supply, support, or aid, especially one that can be readily drawn upon when needed.
- ▶ **Resources:** the collective wealth of a country or its means of producing wealth
- ▶ **Human Health:** The complete state of physical, social, and mental well-being and not merely the absence of illness, disease, or infirmity, is as vital a resource as water, food, or energy.
- ▶ **Health:** Underpins the economy of modern societies, providing employment for many in the health-care sector, and is an important driver of economic growth, accounting for a significant portion of the total expenditure as percentage of the gross domestic product in most countries.

# Background

- ▶ Forests are celebrated annually to raise awareness of their importance
- ▶ This year 2023, forests are celebrated under a theme “Forests and Health”
- ▶ Forests and their ecosystems are essential for human health and wellbeing in addition to other values such as the ecological and economical
- ▶ They support people’s health and wellbeing through prevention, promotion or intervention

# Background cont'd

- ▶ Forests provide, directly or indirectly, important health benefits for all people.
- ▶ For many ILC,s especially in developing countries; forest ecosystems provide edible products that contribute to a healthy diet, such as fruits, and mushrooms, as well as various medicinal plants.
- ▶ Forest environmental services include provision of freshwater, flood control, soil fertility, microclimate regulation and a habitat.
- ▶ Forests also contribute to human health in less direct ways, and for people less directly associated with forest habitat, i.e. the urban dwellers.
- ▶ In discussing the overall role of forests for human health, the concept of health has to be understood widely to include not only treatment of diagnosed illnesses, but also ways to sustain health and wellbeing and prevent illness.

## Background cont'd

- ▶ In today's modern society, lifestyle-related diseases play an increasingly important role as the cause of bad health.
- ▶ Staying in and access to environments that contain natural elements such as forests, parks and gardens has been featured because of its potential to stimulating people's health and well-being.
- ▶ Sustainable use of Forests is key to combating climate change and contributes to the prosperity and well-being of current and future generations.

# Background cont'd

- ▶ This sustainable forest management also plays a crucial role in poverty alleviation hence achieving the Sustainable Development Goals (SDGs). However, despite all these priceless ecological, economic, social and health benefits, forests are endangered by fires, pests, droughts, and unprecedented deforestation
- ▶ This year's theme "Forests and health" gives so much to our health.
- ▶ Other than forests providing goods and services, employment and income to perhaps 2.5 billion people worldwide, recognition of the importance of forests for health security and nutrition has significantly increased in recent years.
- ▶ The theme calls on healthy forests for healthy people.

## Benefits of forests to human health: Forest visits enhance physiological and psychological health

- ▶ Poor health on the increase esp. in urbanized societies, partly due to modern lifestyles that are related to sedentary work and mental stress
- ▶ The potential of natural and green spaces in enhancing human health has been recognized globally
- ▶ Forest environments promote humans' mental and physical health in many ways: reducing stress, recovering from attentional fatigue, enhancement of psychological and physical rehabilitation.



## Benefits of forests to human health: Forest visits enhance physiological and psychological health

- ▶ Forests and MP's may assist both in preventing illnesses mediated by psychological processes e.g. stress and in curing diseases such as burn-out and depression (Kyolo Kule Samuel et al, 2022).
- ▶ Forest visits increase physical activity and may strengthen the human immune system among many other health benefits –need for further research

# Food safety net

- ▶ Forest biodiversity helps to combat malnutrition and diseases of the most vulnerable populations in developing countries.
- ▶ Forest food provides a safety net in case of food shortage and mitigates food insecurity and malnutrition.
- ▶ Forest food may add nutrients that people might not get otherwise and may help people to survive in times of famine, war or drought.
- ▶ Forest food may be a source of nutrition, e.g., for immune compromised persons who may not have access to health/nutritional supplements

# Food safety net

- ▶ Typical forest foods are fruits and nuts, wild leaves, palms, wild roots and tubers, mushrooms, and insects. Forest foods include proteins and fat, carbohydrates, vitamins, and minerals.
- ▶ They also include phytochemicals such as phenolics and carotenoids. However, excessive use of forest food with no scientific evidence may sometimes end up in consumption of toxic compounds
- ▶ Forest food, e.g., berries and mushrooms, are used in Western countries as well, usually because of their good taste or nutritional and health-promoting values.

## Food safety net cont,d

- ▶ Berries contain phenolic compounds, such as flavonoids, phenolic acids- These have remarkable high antioxidant activity .
- ▶ The risk of some chronic diseases, such as heart disease, lung cancer, prostate cancer, asthma, and type 2 diabetes, may be lower at higher dietary flavonoid intakes.
- ▶ However, more research on the consumption and bioavailability of dietary bioactive compounds is needed in order to properly evaluate the role of these compounds in the prevention of diseases in order and to make science-based dietary recommendations.

# Forest-related diseases and hazards

- ▶ Forest environments may, however, also pose risks to human health.
- ▶ People living in forests or otherwise having frequent contact with forests may be exposed to forest-related infectious diseases.
- ▶ The lifecycle of many infectious diseases involve the pathogen, the vector, and the human. The vectors are often insects, but can also be mammals.
- ▶ Many infectious diseases such as and malaria, are associated with forests, which are the preferred habitat for vector and host populations

# Forest-related diseases and hazards

- ▶ Infectious diseases are severe, especially in tropical regions such as Uganda
- ▶ Emerging viral zoonoses, population growth, human movement, economics, power and disease are intimately interconnected, but predicting the impact of specific Handling and consumption of bushmeat increase exposure to many viruses and may underlie the emergence of various diseases including HIV and Ebola
- ▶ Trees/plants have bioactive compounds that can mitigate these diseases

## Forest-related diseases and hazards cont'd

- ▶ Emergence of infectious diseases is linked among other things to deforestation, loss of biodiversity, habitat alteration
- ▶ Human-induced land-use changes are often considered as the primary drivers of infectious disease outbreaks
- ▶ Ecosystem alterations affect the emergence of the diseases by changing the ecological system as well as the habitats of hosts or vectors and parasites.
- ▶ Modification of forest ecosystems—for example, deforestation, forest fragmentation, and biodiversity degradation—beyond a certain threshold may increase the risk of disease transmission

# Forest-related diseases and hazards

- ▶ Increased edge effect can promote interaction among pathogens, vectors, and hosts as well as the population growth of vectors and hosts .
- ▶ Research efforts are needed to clarify how forests can be used in regulating the emergence of infectious diseases.
- ▶ Climate change may enlarge the occurrence area of infectious diseases. –further research and modelling required
- ▶ Forests also include other risks to human health; for example, forests expose people to physical hazards such as forest fires, floods, drought, soil slides, and haze.



## Forest-related diseases and hazards cont'd

- ▶ Forests also include dangerous wildlife and toxic fruits, foliage, and fungi. Forests include flora and fauna that can provoke allergic or irritant reactions, for example, bites of insects and snakes may cause simple localized reactions or serious systemic reactions in sensitive people.
- ▶ The pollen from trees, shrubs, weeds, and grasses is one of the main causes of allergy, and there is a clear need to identify nonallergenic or low-allergenic trees and other plants in ex-vivo conservation of forests

# Forests provide and medicines

- ▶ Galenicals
- ▶ Bioactive compounds- polyphenols e.g. flavonoids, phenols, tannins; Phytoestrogens e.g.
- ▶ Drugs/medicines-Quinine e.g. carotenoids, sterols-these have antioxidant properties, anticancer activities among others
- ▶ Medicinal products such as taxol a compound from taxus bark is considered to contain the best treatment outcomes for breast and ovarian cancers

# Forests provide and medicines

- ▶ Many of the medicines we rely on today come from forests. 25 per cent of medicinal drugs used in developed countries are plant-based, while in developing countries, it can be as much as 80 per cent.
- ▶ Forests also provide essential health products such as hygiene and sanitary items like toilet paper, paper towels, tissues and ethanol for sanitizers.
- ▶ Even the masks and protective clothing that frontline medical workers depend on are created from forest products like wood pulp and soluble cellulose fiber.

## Other natural health products aside plants/trees

- ▶ Microbial endophytes
- ▶ Fungi-Medicinal use of mushrooms a tradition in Asia even in Africa
- ▶ The macro fungi-microbial effects-inhibit fungi, bacteria, protozoa,
- ▶ Basidiomycetes have antitumour activities
- ▶ Fermentation of endophytic fungi isolated from plants as antitumour agents-rapidly diminishing rainforests, which hold the greatest resource of novel bioactive compounds

# Forests shield us against future pandemics

- ▶ At present, 60 per cent of all infectious diseases and 75 per cent of all emerging infectious diseases are zoonotic. These diseases originate from the transfer of pathogens from animals to humans, and they usually occur when natural landscapes, such as forests, are being c
- ▶ Other diseases emerging from forests such as severe acute respiratory syndrome (SARS).

# Forests and the indigenous and local communities

- ▶ Some indigenous communities can depend on forests in terms of subsistence, health, income and culture; their total way of life may depend on the forest e.g. Batwa
- ▶ They have useful stores of indigenous knowledge that can be tapped to improve or sustain human health.

# Forests and the indigenous and local communities cont'd

- ▶ To improve human health and forest sustainability, it is necessary to consider which categories local populations belong to and to assess how forest dwellers can contribute to improving forest management.
- ▶ It is also necessary to take note of variations in forest knowledge and use within forest communities (by age, gender, caste, etc.).
- ▶ The market for traditional medicines is large and expanding worldwide. In Western countries, forest herbs are intensively used among some groups who consider natural products healthier than synthetic drugs.

## Food and nutrition

- ▶ Nutritious foods from forests. ( Ojelel et al 2020) Poor people are disproportionately dependent on such food. The adequacy of hunter-gatherers' access to nutrients from the forest and the nutritional value of many forest foods are still under investigation. Nonetheless, wild foods continue to provide the major portion of the animal fats, proteins and minerals in the diets of millions of people.
- ▶ Forests are also important reservoirs of genetic resources which provide some foods at present and hold the potential to nourish a wider public in the future. The wild relatives of many common crops represent an important global heritage.
- ▶ Food-related health problems that affect people living in



# Food and nutrition Cont'd

- ▶ Landscape modification is often motivated by the need for food. Some manipulations maintain forest cover and increase food production at the same time. Changes in forest composition caused by logging, hunting and invasive species have diverse effects on food availability. Different stages of forest regrowth vary in food productivity.
- ▶ The distribution of food within forest households can be inequitable, with women and girls particularly at risk. Forest (and other) diseases can adversely affect people's access to foods. Illness and death from HIV and AIDS, as well as care-giving responsibilities, reduce the effective working adult population - and thus family food supply (see Holding et al., this issue).. Fuelwood is commonly used for cooking in forested areas and presents serious respiratory health hazards, particularly for women and children

**People residing in and near forests typically obtain a considerable, although variable, amount of nutritious foods from forests – with poor people generally more dependent on such food (children eating fruits of *Borassus aethiopicum*, Senegal)**



# Challenges

Main challenges to delivering health through forests are due to some of the following:

- ▶ Ecosystem and biodiversity degradation
- ▶ Deforestation
- ▶ Climate change and its negative effects on vegetation
- ▶ Natural habitat loss
- ▶ Over exploitation of selected forest resources i.e. medicinal plants
- ▶ In addition, major implementation of research results into practice is inadequate.
- ▶ Conflicts between the ILC's against the forest management teams

## CHALLENGES Cont'd

- ▶ Increased market demand for pharmaceutical products can lead to overharvesting of some species
- ▶ This may cause extinction of endangered species and the destruction of natural habitats -loss of one species may affect the ecosystem
- ▶ Lack of evidence based medicine
- ▶ Inadequate technologies for ecological studies-i.e the need determine overall species composition, occurrence and abundance in the different forests-use of drones
- ▶ Growing population and impact of the forest/land resource

# CHALLENGES Cont'd

- ▶ Insufficient scientific evidence on physiological and psychological health benefits of forests
- ▶ Relationships between forests and infectious diseases
- ▶ Inadequate knowledge on cultural, individual, and social differences in adopting the health benefits of green environments.

## Possible solutions

- ▶ Utilizing forests /products effectively in health provision could reduce public health care budgets and create new sources of income.
- ▶ Cooperation among researchers, policy-makers, foresters, health and environmental professionals.
- More research to provide evidence based natural medicines
- Synthesis of medicines from novel bioactive plant molecules

# Possible solutions cont'd

- Strengthen existing value chains in key forest species with medicinal/health benefits and create those that are lacking
- Afforestation
- Enhanced cultivation of medicinal trees/plants with Improved technologies such as tissue culture for improved varieties
- Strengthening the links amongst the basic sciences and applied sciences, research, policy makers and health practitioners
- Sustainable utilisation of the forest materials and products obtained from forests

## Possible solutions cont'd

- ▶ Implementation of the Nagoya protocol resolutions on access and benefit sharing (ABS) at all levels of genetic resources including TK
- ▶ Implementation of Aiche target 8J on TK
- ▶ Updating of the NBSAP to include the CBD pertinent issues on forest/resource conservation and their implementation by the relevant lead agencies
- ▶ The need for inventories, data basing and DSI remain paramount



## Conclusion

- ▶ Forests help in controlling infectious diseases and provide food as well as new pharmaceuticals and nutraceuticals
- ▶ Forests may advance the achievement of the SDG's, especially combating hunger, poverty, and poor health.
- ▶ Forests provide numerous ecosystem services that help in maintaining and improving healthy living environments.
- ▶ Forest visits enhance mental and physical health of humans
- ▶ New innovations as well as new businesses and services, such as forest-derived health-related products and services, have enormous potential.
- ▶ In addition, wide application of forest therapy and green exercise could significantly reduce national health care budgets.

# The trade is on going



- ▶ Many western pharmaceutical products derive from tropical forest species; shown, bark of *Prunus africana* destined for the European market. EcoPort ([www.ecoport.org](http://www.ecoport.org))/3169/A.B. Cunningham

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