

Research and Development for Sustainable Forest in Asia

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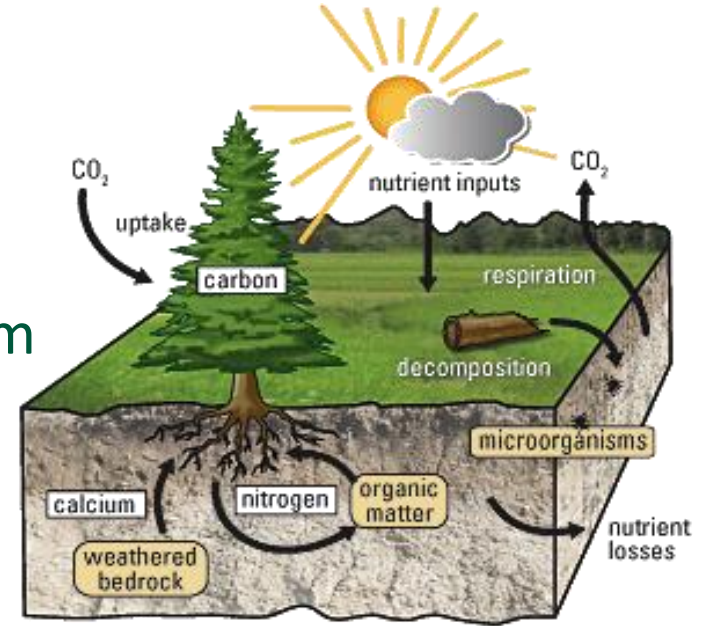
Seoul National University

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I. Introduction - FOREST

- Forest (林, 森)
- Tree (木)
- Human (人)
- **Role of tree?** CO₂ enters through the shoot (leaf and stem) while root system takes in nutrients and water, and improves soil environment.
- C sequestration and N fixation



I. Introduction - FOREST

- Soil (土)
 - Land (土地)
 - 身土不二
(Human body and soil are not two)
- Healthy/good soil is fundamental to a healthy body.

Soil the foundation of nutrition

2015 International Year of Soils
Soil degradation leads to the loss of soil micro and macronutrients
Nutrient-poor soils are unable to produce healthy food with all the necessary nutrients for a healthy person
Over 2 billion people suffer from micronutrient deficiencies

Role of 18 nutrients necessary for plant growth and human health

- Plant Growth:**
 - Promote plant growth
 - Improves water hardness
 - Involved in photosynthesis
 - Increases disease resistance
 - Reduces plant respiration
 - Promotes root formation and growth
 - Increases water use efficiency
 - Stimulates microbial activity
 - Promotes nodule formation on legumes
- Human Health:**
 - Involved in carbohydrate metabolism and translocation of starches
 - Promotes reproduction
 - Aids translocation of photosynthesis from leaves to fruiting organs
 - Acts as an O₂ carrier
 - Fruit formation
 - Quickens maturity
 - Fruit quality
 - Fruit colour
 - Seed formation
 - Seed quality
 - Enhances maturity of small grains
 - Helps enzyme functionality and plant use of N and P
 - Responsible for enzyme activity
 - Helps enzyme activity and increases the availability of P and Ca
- Human Body:**
 - Plays a key role in brain and muscle function
 - Contributes to perception of taste
 - Needed for immune system health
 - Key component of protein
 - Essential for muscle and nerve activity
 - Important in immune system health, blood clotting and pressure regulation
 - A component of proteins, DNA, RNA and blood
 - Promotes digestive processes
 - Maintains acid-base balance
 - Needed for proper fluid balance
 - Essential for fetal development and functioning of reproductive system
 - Key component of enzymes
 - Helps deliver oxygen to the tissues
 - Important for healthy bones
 - A component of enzymes, DNA, RNA, proteins and generation of immune system health
 - A component of enzymes and involved in Fe metabolism

Soil macronutrients: N, P, K, Ca, Mg, S

Soil micronutrients: B, Cu, Fe, Mn, Mo, Na, Si, Zn

Soil Management:

- Increase soil organic matter content
- Minimize tillage
- Keep soil surface covered
- Reduce erosion
- Ensure crop rotation

Sustainable soil management for healthy soils, healthy food and healthy people

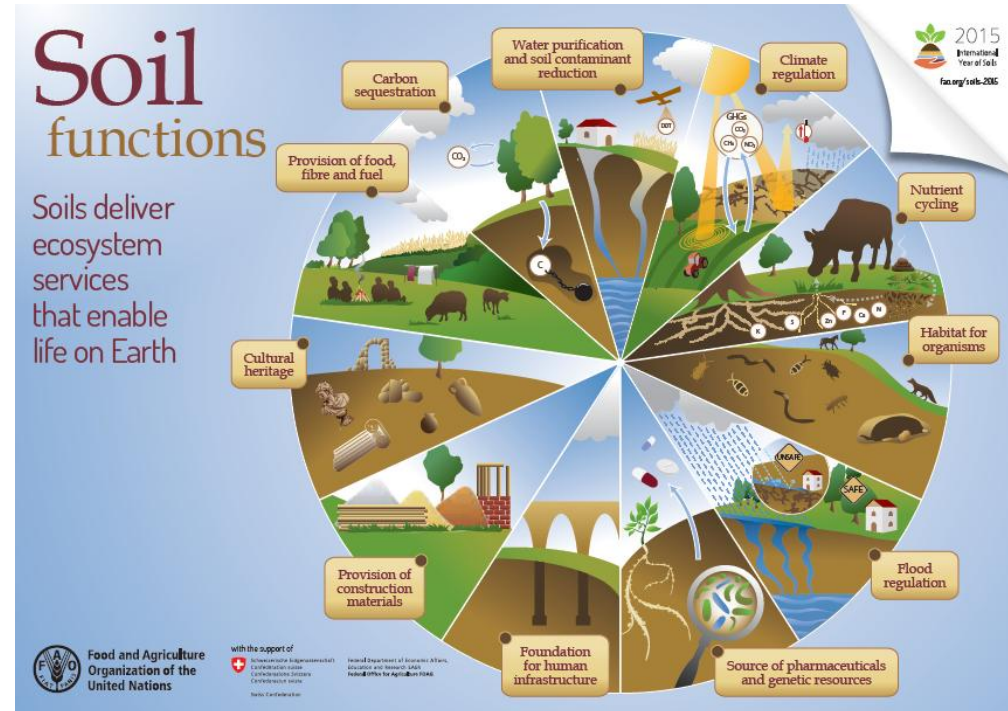
Food and Agriculture Organization of the United Nations
With the financial support of the Russian Federation

Healthy soils for a healthy life

I. Introduction - FOREST

Diverse Roles of Soil

- Food and other biomass production
- Environmental interaction:
 - storage and filtering
- Biological habitat and gene pool
- Source of raw materials
- Physical and cultural heritage:
 - archaeological artifacts,
 - paleontological materials
- Platform for man-made structures:
 - buildings, highways



I. Introduction - FOREST

Roles of forest?

- Ecological - **Soil stabilization, water resources, support biodiversity, protection against natural hazards**
- Economical - **Timber and non-timber products, ecotourism, community management**
- Social - Beautiful landscape/amenity for **recreation** and **healing**

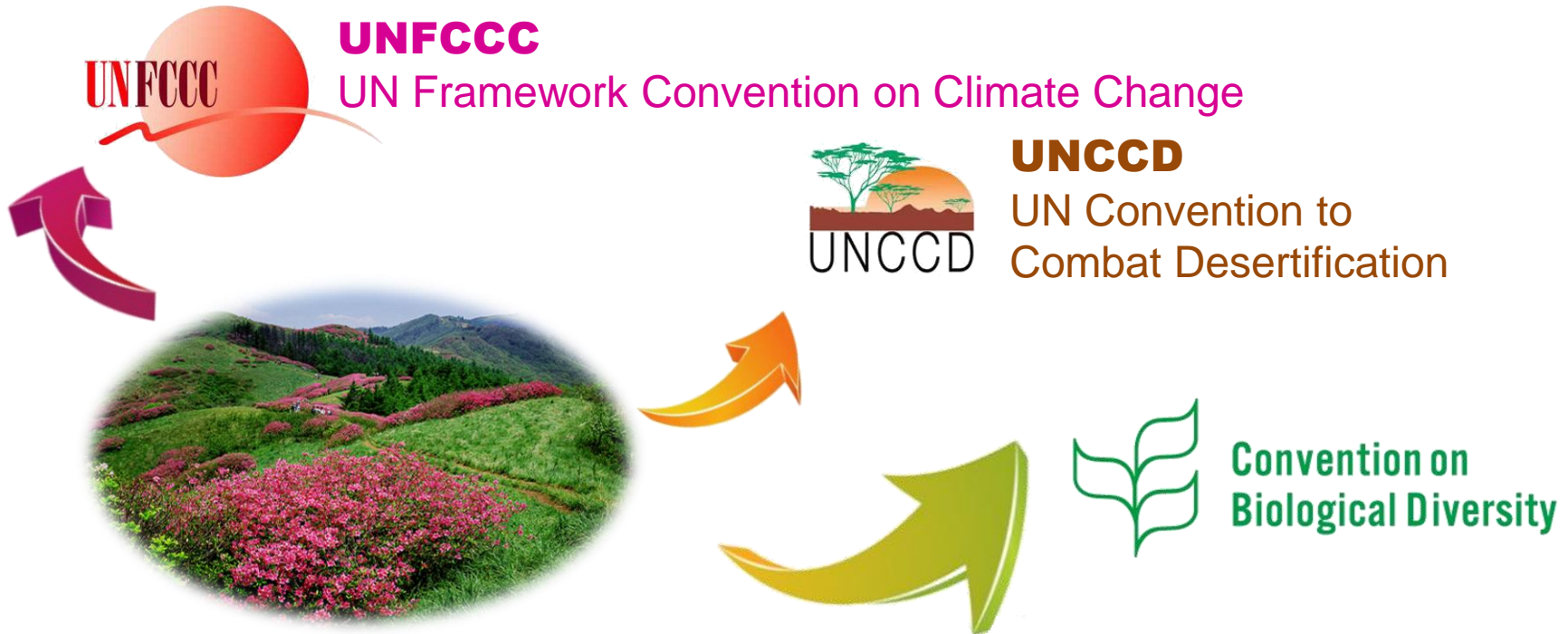
The NY Declaration on Forest at UN Climate Summit; Sep 23, 2014, signed by 27 nations
"Forests are essential to our future. More than 1.6 billion people depend on them for food, water, fuel, medicines, traditional cultures and livelihoods"

UN Secretary General Mr. Ban Ki-moon's Statement

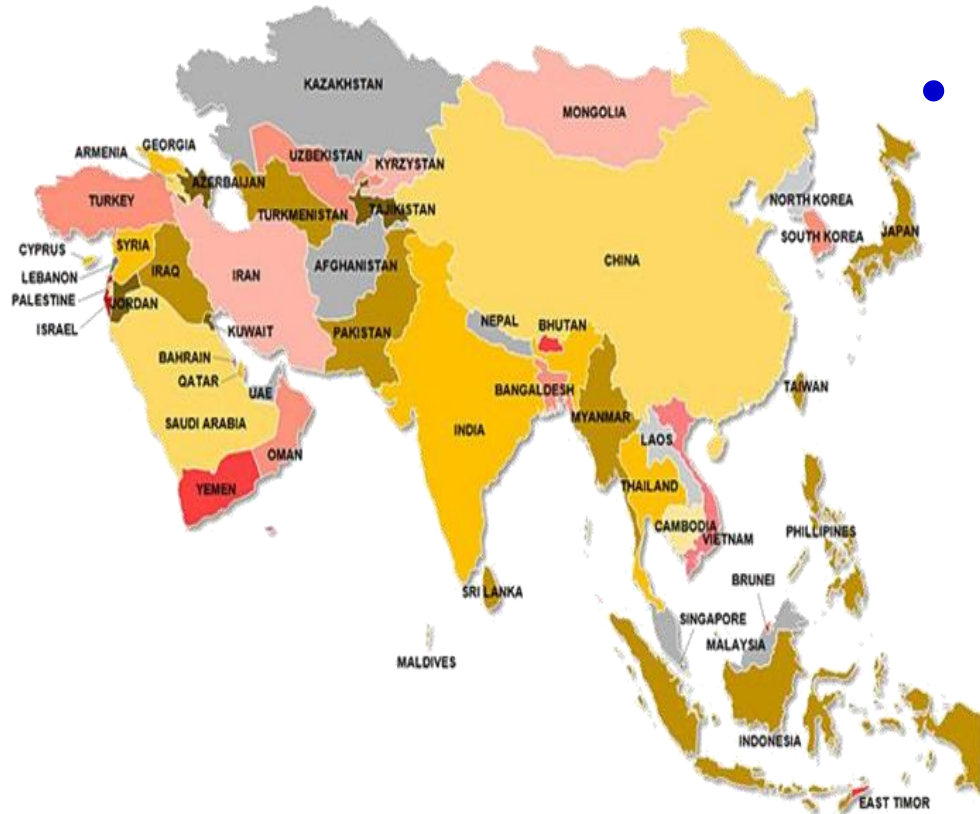
"The climate change cannot be won without the global forest": The role of forest to climate change.

I. Introduction - FOREST

Forests – Key to Environmental Crisis



I. Introduction - ASIA

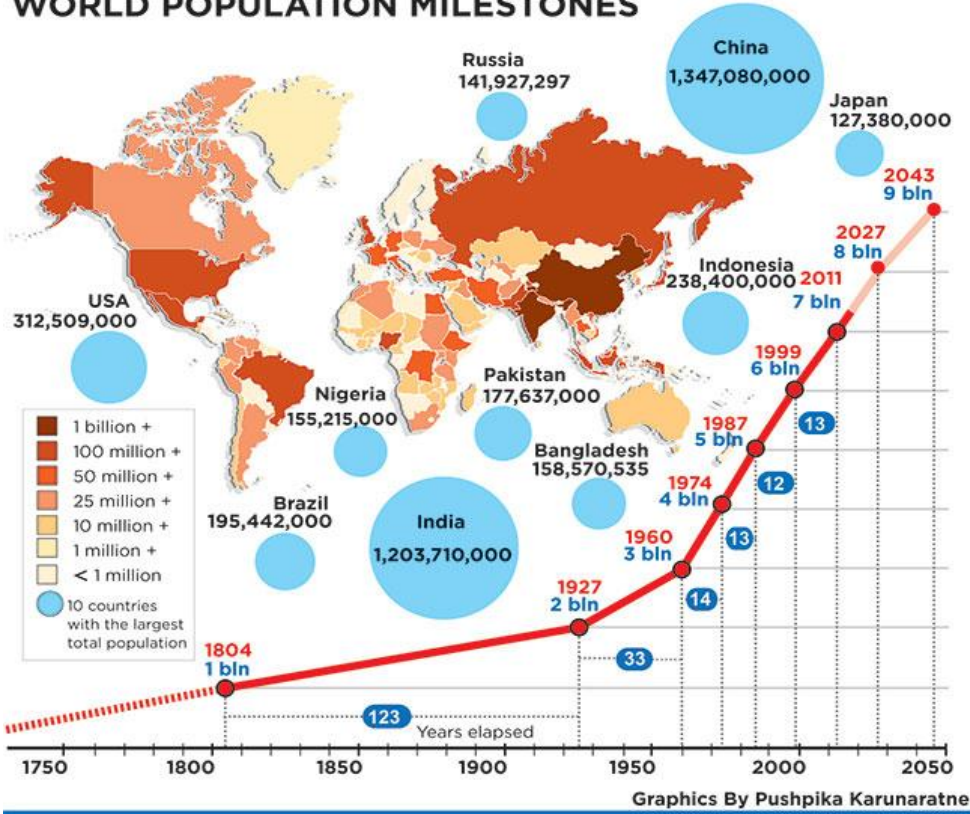


- **Asia**

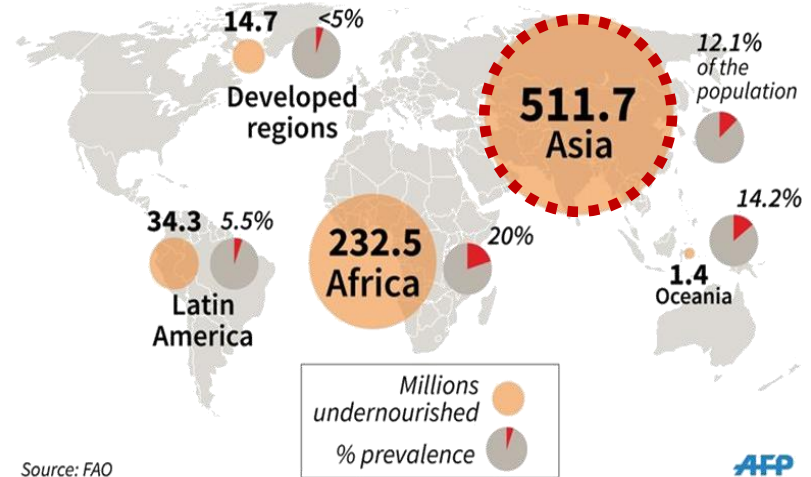
- **44,579,000 km²** of land area, 30% of Earth's total land area
- **48** UN members and **6** other states

I. Introduction - ASIA

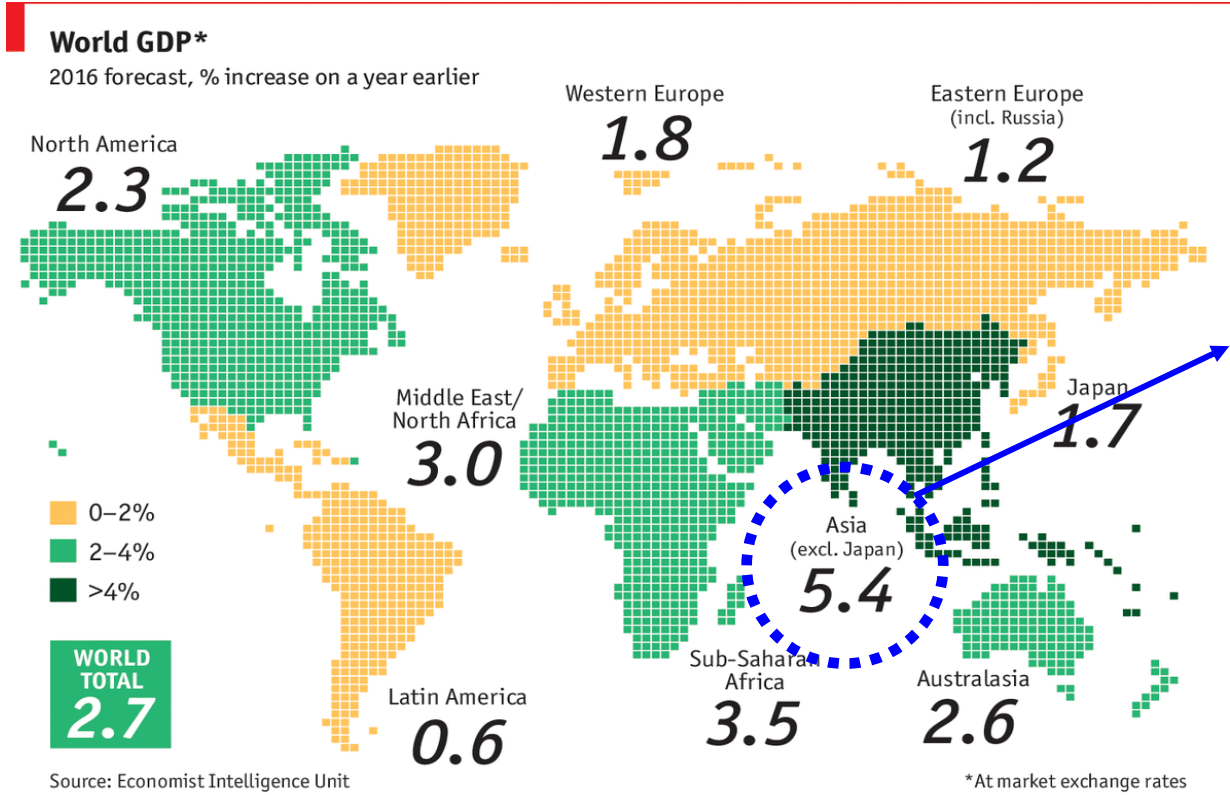
WORLD POPULATION MILESTONES



- Asia, Earth's largest and most populous continent.
- 511.7 M people are under-nourished (FAO, 2015)



I. Introduction - ASIA



Asia is experiencing a more rapid increase of annual GDP by 5.4% than the other regions.

I. Introduction - SUSTAINABILITY

“Today is a son of yesterday and a father of tomorrow”



Yesterday



Today



Tomorrow

“Who creates SUSTAINABILITY?”

“Collaborative partnership” between young and old generations



- **More attention to young people** must be given now and in the future.
- Spirit of the **young passion, dynamical mind, creativity, imagination, adventure, and overcoming failure** should be fully encouraged.
- Young generation needs full support from older generation.
- **Women in forestry** needs more support.

I. Introduction - CHALLENGES TO OVERCOME ¹³

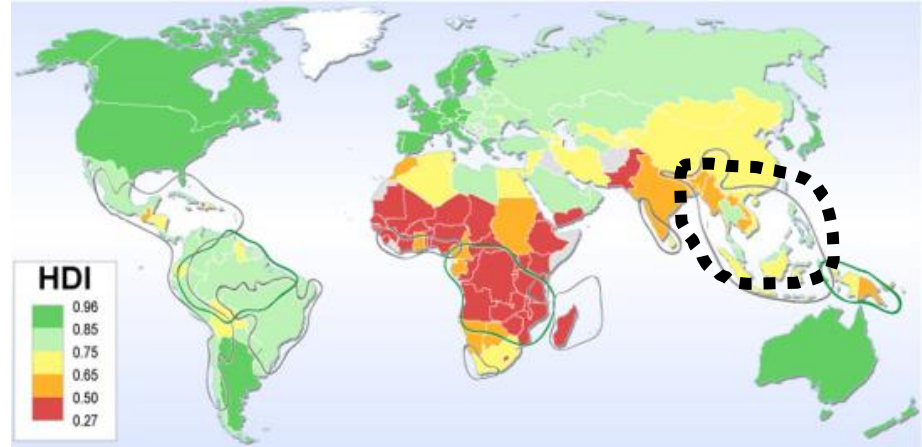
Global as well as Asian challenges/issues:

- **Climate change** (fire, typhoon, sea level rise, drought, desertification, landslide, flood, etc.)
- **Land/soil degradation, water shortage**
- **Natural disasters** (typhoon, earthquake, wildfires, etc.)
- **Poverty**, health, disease, pest, unbalanced food supply, pollution, urbanization, etc.



II. What We Have Done for Sustainability

- **Education and research** to enhance awareness, build capacity & empower marginalized communities
- Development for economic growth **w/o environmental degradation** but **with environmental conservation and sustainability.**
- **Strength in Asia:** Plenty of natural resources and biodiversity (illegal harvesting/ marketing/ trading)



Asia, holding major biodiversity hotspots, has comparably lower HDI
(Source: UNDP, 2004)

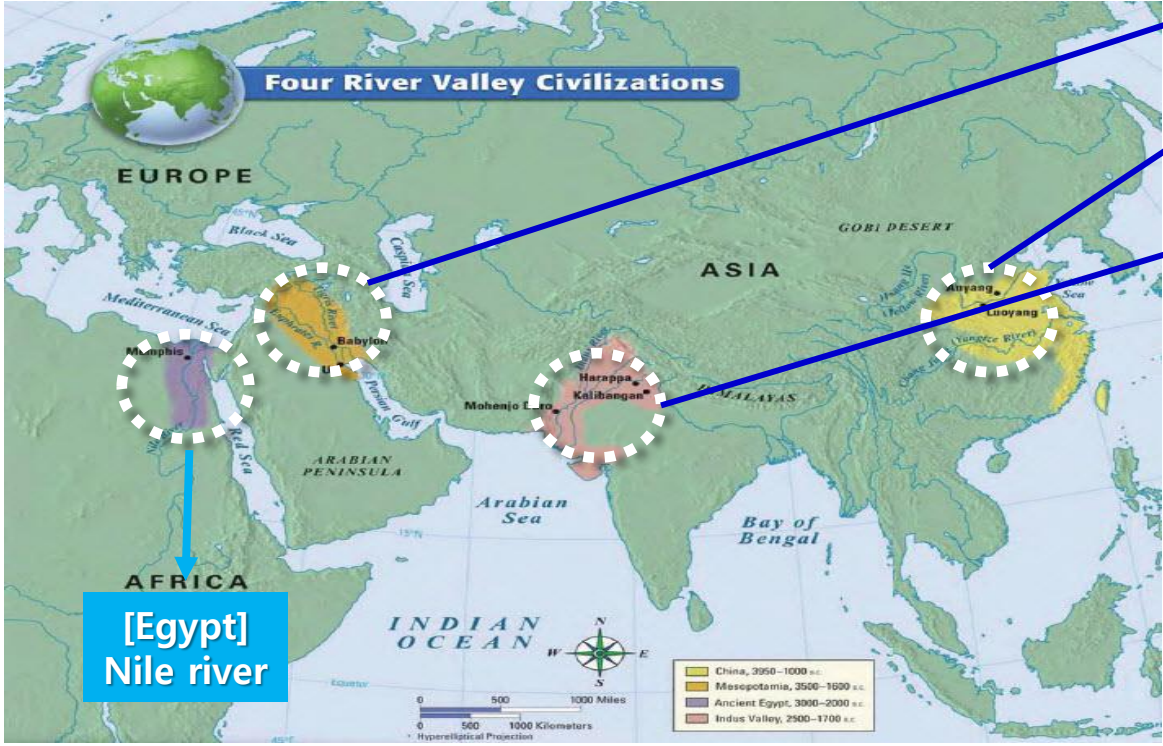
II. What We Have Done for Sustainability

- **Respect indigenous people rights and ancestral domains**
 - ensure land security and ownership
- **Community-based forest management**
 - enhance joint management and reduce conflicts over land



II. What We Have Done for Sustainability

Asia, historically a center of civilization



[Mesopotamia]
Tigris & Euphrates rivers
[Shang China]
Huang He or yellow river
[India]
Indus river

- Civilization began early in Asia, along the major river valleys
- **Sustainable agriculture first started in Asia** through rice culture.

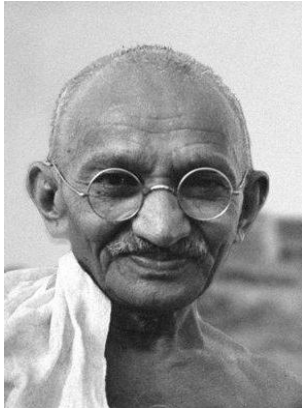
[Egypt]
Nile river

Political Leaders



MAO Zedong
(1893~1976)

CHINA



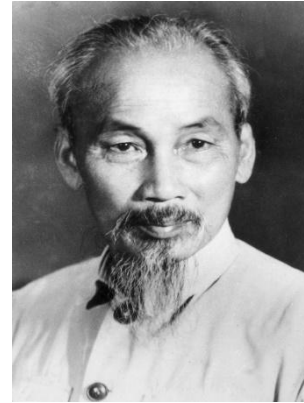
**Mahatma
GANDHI**
(1869~1948)

INDIA



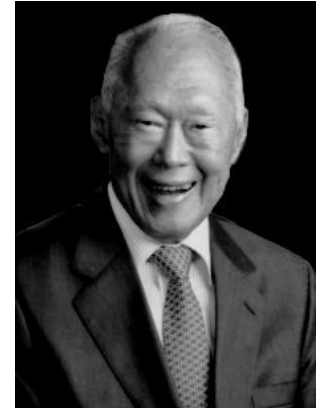
**PARK
Chung Hee**
(1917~1979)

KOREA



**HO
Chi Minh**
(1890~1969)

VIETNAM



**LEE
Kuan Yew**
(1923~2015)

SINGAPORE

Spiritual Leaders



▶ **Wonhyo**
(617–686)
Uisang
(625–702)

**Gautama
Buddha**
(4-6 C. BC)
Ancient India



Confucius
(551-479 BC)
CHINA

▶ **Yi Hwang**
(1501–1570)
Yi I
(1536-1584)
Yi Sun-sin
(1545-1598)



**UCHIMURA
Kanzo**
(1861~1930)
JAPAN

IV. What and How to Do for Sustainability?

- **Think globally, act locally as well as globally**

Research/education to be developed for:

- current and future needs/demand
- problem-solving, *e.g.* scarcity of land, desertification, pest & diseases, optimization of raw materials

- **Environmentally friendly and sustainable development**

New policy / policy reform:

- green economy
- commitment by governments

IV. What and How to Do for Sustainability?

From MDGs
(2000-2015)



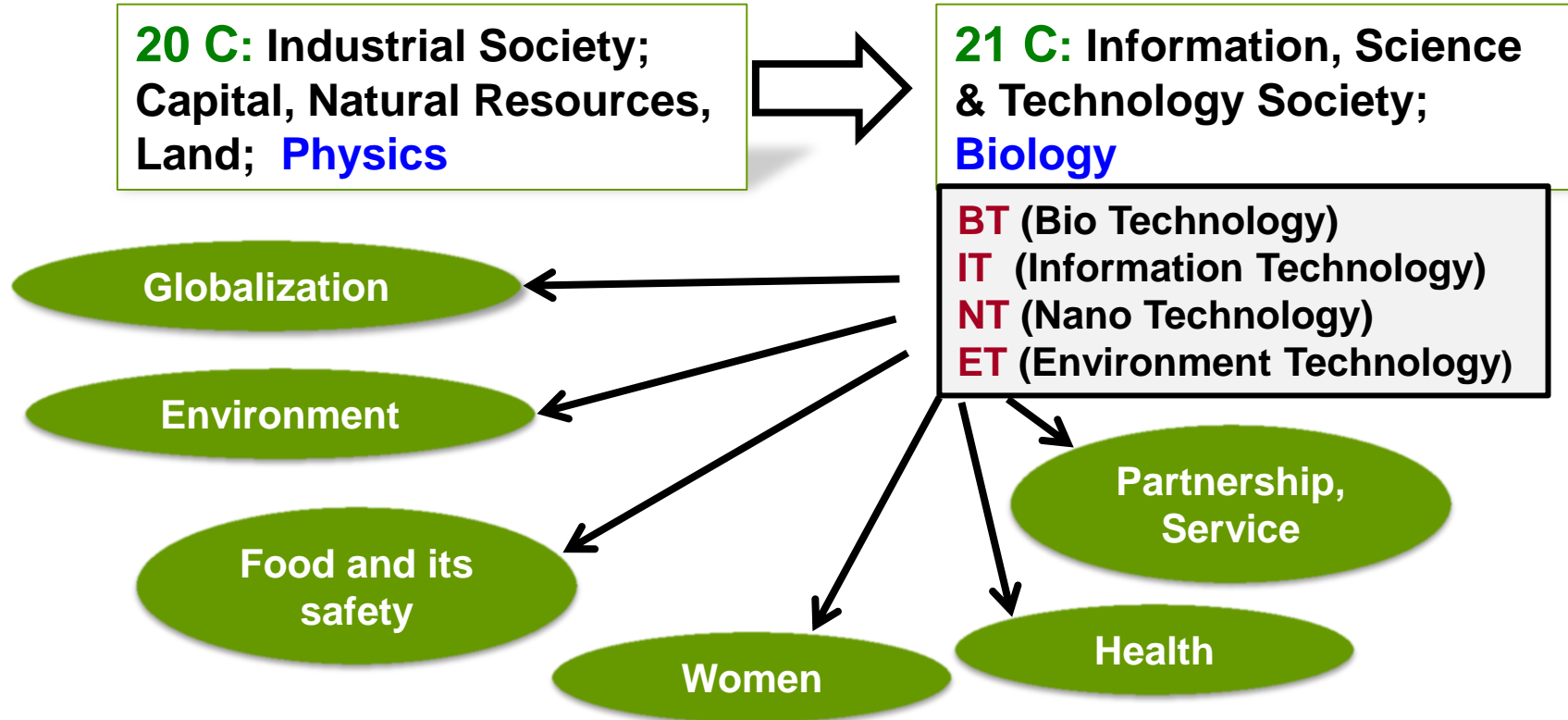
To SDGs
(2016-2030)



Ban Ki-Moon clustered SDGs into six "essential elements":
Dignity, prosperity, justice, partnership, planet, and people.

V. Sustainable Future Forest in Asia

20th Century is different from 21st Century....



V. Sustainable Future Forest in Asia

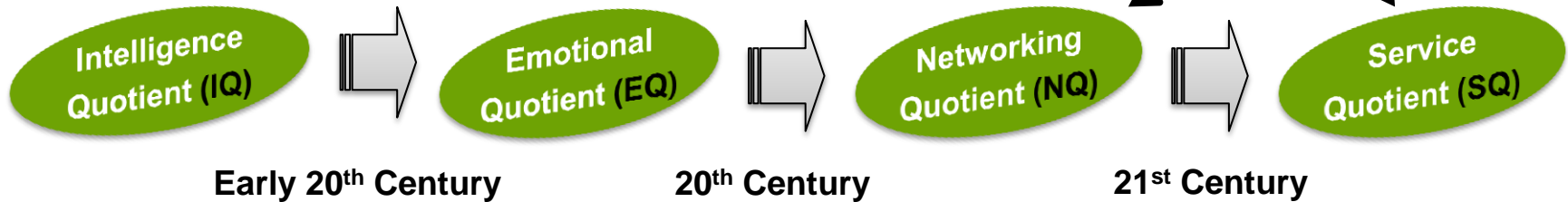
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Strategies and Outlook for the 21st Century

Changing Society...



New paradigm & thinking needed



SQ to be globally important for partnership and cooperation

V. Sustainable Future Forest in Asia

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TRUST

Relationship

myself, neighbors, nations, and nature

Partnership

among countries, GOs and NGOs

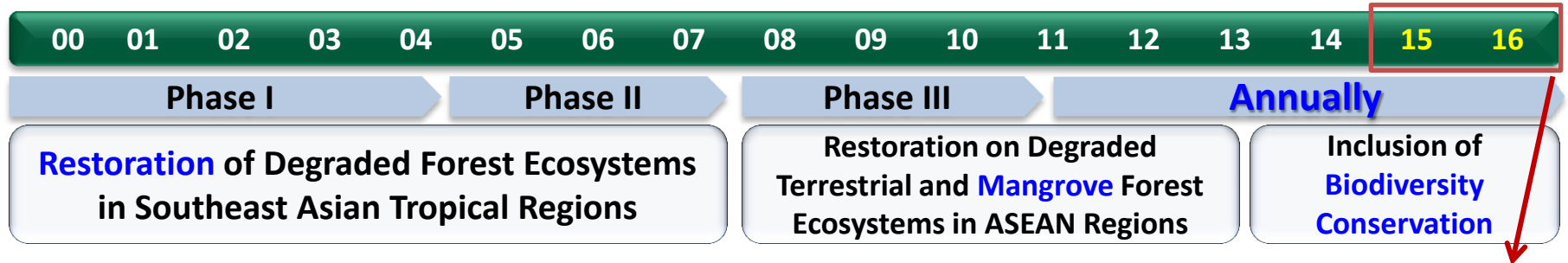
Leadership

strong leadership (honest, clean) at local, regional, and country levels

V. Sustainable Future Forest in Asia

ASEAN-Korea Environmental Cooperation Project (AKECOP)

- AKECOP is a cooperation project between ASEAN Member States and the ROK addressing environmental issues, funded by **ASEAN Cooperation Fund** in collaboration with Korea MOE.
- It has been implementing **research & educational project** since on 2000 to support capacity development of forest related human resources in ASEAN and Korea.



2015~2016:

“Restoration of Degraded Ecosystems and Conservation of Biodiversity in the ASEAN Region”

V. Sustainable Future Forest in Asia

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Major Activities of AKECOP

- Regional Research in AMS – restoration, conservation, etc.
- On-site Research in the Philippines – rehabilitation, biodiversity, social forestry
- Short-term Training Courses/Workshops
- Graduate Scholarship – Master & Doctoral degrees in Korea universities
- NICEM Education & Training Programs
- Public Awareness/ Publications



V. Sustainable Future Forest in Asia

AFoCO, Asian Forest Cooperation Organization



 1st stage

[AFoCo]
ASEAN+ROK (11)
(2012-2016)

 2nd stage

[AFoCO]
Asian Countries (15)
(2017-)

- **AFoCO** is an inter-governmental regional organization in the field of forestry based on **ASEAN-ROK Forest Cooperation (AFoCo)** and participation of other Asian countries as Parties.
- AFoCo completed its successful deliberation on 4 August 2016 and paved the way towards the formalization of **AFoCO**.

V. Sustainable Future Forest in Asia

The vision of AFoCO

contribute to strengthening regional forest cooperation by undertaking proven technology and policy into concrete **actions**.

Sustainable Development for a Green Asia

Forest Rehabilitation and Prevent Forest-related Disasters

Rehabilitate forest ecosystems to prevent calamities

Restore tropical forests and combat desertification in Asia

Prevent forest disasters

Climate Change Mitigation & Adaptation

Enhance forest C stocks and support initiatives on mitigation/ adaptation of climate change impacts

Support REDD+ activities and prevent forest disasters

Reinforce sound industrial plantation within the region

Sustainable Forest Management

Promote sustainable forest management practices

Encourage sustainable trading of forest products

Protect livelihood of forest-dependent and indigenous communities

Promote community-based forestry activities

Capacity Building and Transfer of Technology

Establish human resource development

Raise public awareness

Research and development in the forest sector

Establish database for comprehensive information sharing

Partnership between the Parties and with other entities *

** A newly incorporated mission through the negotiations over the Agreement text. Corresponding objectives have yet been developed.*

V. Sustainable Future Forest in Asia

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AFoCO's Approach



1. Action-oriented

Focusing on transferring know-how, experience and technology related to current issues on targeting rehabilitation of degraded & deforested areas at ground level



2. Regional-based

Fostering close cooperation through joint efforts of participating countries towards a common regional goal



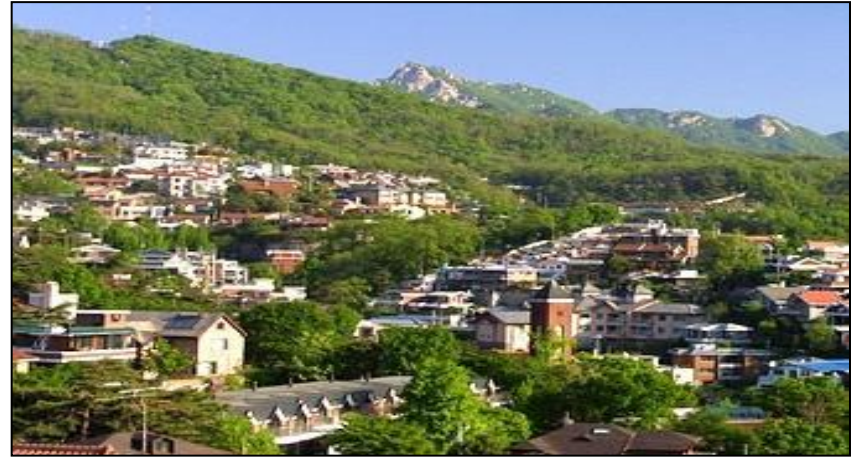
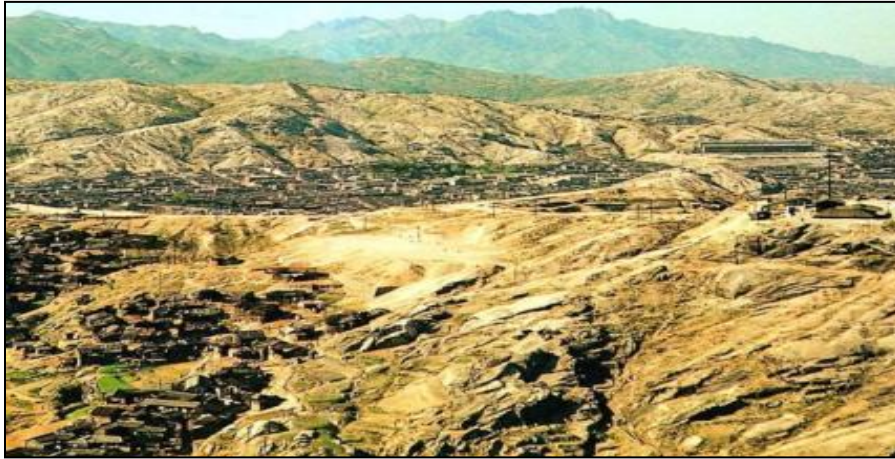
3. Country-driven

Developing projects based on each country's priorities under specific national strategies

VI. A Case of Korea

Success story of reforestation in Korea

Growing stock changes: **6 m³/ha** in 1953 → **146 m³/ha** in 2014



Seongbuk-dong area, Seoul, Republic of Korea in 1950s (left) and present (right)

Success story of reforestation in Korea

Governance

- Korea Forest Service
- Forest Protection Law



People's Willingness

- *Sanlimgye*
(a mutual aid association in village forestry)



Leadership

- Reforestation as a national agenda



Saemaul Spirit (1.0)

- **CAN DO**, Better life, Cooperation, Self-help, etc.



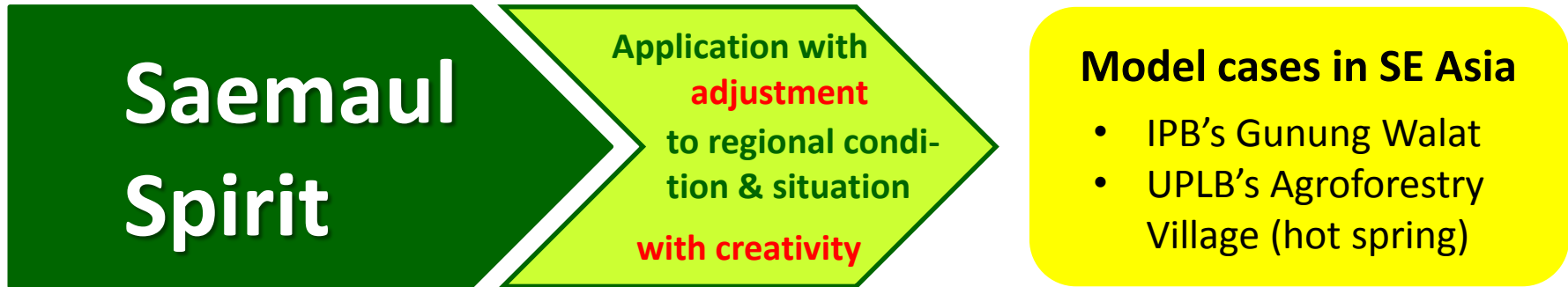
Economic Growth

- Substitution of firewood with fossil fuel (coal)



Saemaul Spirit into Forest Policy and National Development in Asian Regions

- Saemaul Spirit 1.0: Diligence, Self-help, Cooperation
- Saemaul spirit 2.0: **Sharing, Service, Creativity**

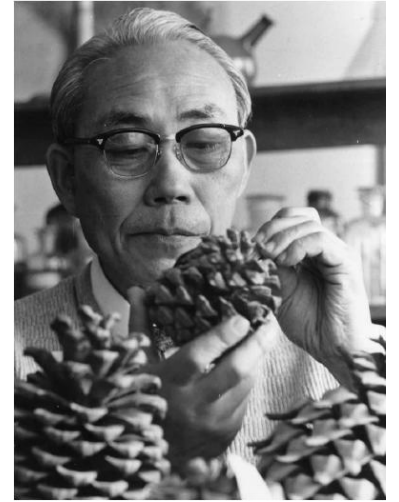


VI. A Case of Korea

Role of Green Leaders – strong political will; short, medium & long term plans



President PARK Chung Hee



Dr. HYUN Sin Kyu

Human resources capacity building done in Korea as a success model.

- 1950-70s in Korea ▶▶▶ **Hungry Spirit** for Food and **Learning**
"We all were infected with NEED-virus"
- **Capacity Building of Human Resources,**
fundamental driving force for national greening and development

Minnesota Plan-Education

- Part of reconstruction programs for Korea in 1950s
- Supported 226 faculty members of Seoul National University for learning advanced technologies at University of Minnesota for 7 years.

NICEM-Research

- National Instrumentation Center for Environmental Management in SNU
- Established in 1992, supported by IBRD loan of US\$15 million
- More than 80 full-time staff members, generating over US\$ 8 mill of equipment use fee by more than 36,000 users annually

For A Sustainable Forest Management in Asia

- ➔ Research and Development
- ➔ Human resources capacity building
- ➔ People's willingness
- ➔ Good governance
- ➔ 'CAN DO' spirit; and
- ➔ Green leaders



(Korean pine plantation in Chuncheon, 2009)

THANK YOU!

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