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Challenges and Priority Issues to Combat Desertification and to Prevent Land Degradation in Asia and the Pacific (AP)

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- **Desertification affects over 40% of total land area of the world**
  1. **Asia: The largest amount of land affected about 1.7 B hectares. One third of the entire area is drylands. 71% of its drylands are affected, All Pacific islands states face land degradation, deforestation, soil erosion, botany degradation, drought disaster and fresh water shortage;**
  2. **Africa: Two thirds of the continent is drylands. 73 % of its drylands are moderately or severely affected**
  3. **North America has the highest proportion of dryland, 74%**
  4. **Five of EU countries are affected;**
  5. **110 countries have drylands that are potentially at risk.**
- **Desertification costs annually the world US$42 Billion;**
- **Over 250 million people are directly affected and one billion are under threats or at risk.**

Desertification in AP

Arid lands/drylands and deserts in China, Mongolia and Iran, sand dunes of India and Pakistan, steeply eroded mountain areas of Nepal, and deforested highlands of Myanmar;

Deforested lands are prevailing in the Pacific States and landslides caused by soil erosion; unwise logging of forests causes soil loss;

Sea level rising threatens land surface and people; drought prevails and disasters frequently occur.

Out of a total land area of 4.3 billion hectares, Asia contains some 1.7 billion hectares of arid, semi-arid, and dry sub-humid land reaching from the Mediterranean coast to the shores of the Pacific.

In terms of the number of people and the land mass, AP is the most affected continent and has the largest area under dry lands.

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-AP has the lowest per capita availability of natural resources, and highest population density of all regions. Land loss to urbanization is increasing the pressure to raise crop yields, while non-food crops are claiming expanding land areas.

-AP covers a large/diverse range of ecosystems, including deserts, forests, rivers, lakes and seas. The forest cover is second largest in the world, encompassing large tracts of biologically rich tropical forest.

-Three factors have contributed most directly to the excessive pressure on the environment and natural resources in AP:

1. **a doubling of population over past 4 decades;**
2. **a tripling of regional economic output in last 2 decades; and**
3. **the persistence of poverty.**

-AP covers about 23% of total land area of the planet and is rich in its diverse ecosystems and cultural heritage that must be harnessed for future generations. Desertification is a global problem and is especially severe in this region and two-fifths of land area here is prone to desertification.

-Regionally, AP has the largest population living in dry lands, both in terms of numbers and percent: over 1.4 billion people, or 42 percent of the region's population. Africa has nearly the same percent of people living in dry lands—41 percent—although the total number is less than Asia's: nearly 270 million. South America has 30 percent of its population in dry lands or approximately 87 million people.

North East Asia

Population in NEA accounts for ¼ of the world today. Mongolia and China are being deeply affected by land degradation and top soil loss. PRC, about 27% of the country's land mass is "desertified". Almost 400 million people live in areas prone to desertification, and the economic loss to the PRC has been estimated at around $6.5 billion a year (www.unccd.int).

Mongolia, with a total of 2.65 million of population and a total of 156 million ha of land area. Water resources in Gobi and steppe region are scarce and they are also unsuitable for drinking purposes. Particularly, percent of shifting sands is increased. Recent Infrastructure and mining industry are rapidly developed, which causes damages to environment and socio-economic development .

Central Asia

All countries are severely affected by drought and desertification; In Kazakhstan, 66% of land area is affected by desertification; In Turkmenistan and Uzbekistan this figure is 80%; Erosion affects over 88% of arable land in Kyrgyzstan and 97% of agricultural land in Tajikistan. Over-irrigation combined with inadequate irrigation systems and reuse of drainage water for irrigation, has led to water logging and salinization.

In CA, desertification has become a serious environmental threat which has serious socio-economic ramifications. Agricultural yields have declined 20–30% across the region, and agricultural losses from salinization are estimated to be $2 b. per yr. (www.gefweb.org).

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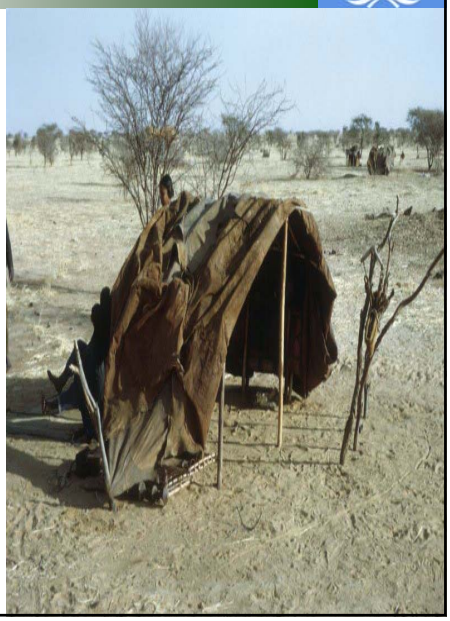
South Asia, South West Asia

Per capita land, for agricultural production has been diminishing with increase in population; loss of agricultural land is taking place at the rate of approximately 1% per year. Thar Desert is the biggest desert in SA and is extending at a rate of 100 ha every year and is causing damage to approximately 130,00 ha of cultivated lands/pastures in India and Pakistan.



Southeast Asia

Mainland component of the SEA is severely affected by land degradation and loss of biodiversity and deforestation coupled with unsustainable management of natural resources is causing enormous environmental problems, including land degradation.

Island component of the SEA constitutes a unique patchwork of marine, coastal, island, terrestrial and agricultural ecosystems with great variations regularly occurring over small distances.

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West Asia

WA has special and unusual Mediterranean climate and is facing environmental problems of land degradation and desertification at one of the highest degrees of hazard. Wind/water erosion, soil salinization, large population and low productivity have accelerated desertification. Most marginal lands in WA are permanent pastures of 1.35 million km^2 and 85% of them are considered to be in danger of desertification.

The Pacific

Climate change and land use changes are crucial threats to the extremely fragile environment service. It is very unique in its geography, ecosystems and natural resources endowment. Land is a scarce resource in the Pacific and all states are suffering from drought effect, vegetation degradation, soil deterioration and soil erosion, land unproductivity and sea level rising. Major environmental problems include:

- **Deforestation and invasive plants;**
- **accelerated soil erosion and unwise mining;**
- **loss of biodiversity and waste; and**
- **water pollution.**

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Key Issues and Challenges in AP

Deforestation

Large-scale destruction of tropical forest resources is recognized as an on-going ecological and economic crisis. As forests are logged for timber and/or cleared for agriculture, so many goods and services provided by its ecosystems, which have taken over millions of years to evolve and sustain humans. Various consequences of deforestation on landscape, including loss of top soil and biodiversity, drinking water contamination, destruction of watershed, unwise cutting of mangroves & worsening coastal environment.

fuel wood collection, Mongolia

Logging of natural forest

Clearing Peat Land for Agriculture, Malaysia

Deforestation in N Thailand

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Drought

Chinese officials attributed extreme droughts to climate change and believed that droughts left millions shortage of water;

In Australia, a drought trend persisting since 2002 reached severe levels in 2006;

In 2000, Iran was in the grip of its worst drought for 32 years and faces critical human suffering. It was estimated that Iran had lost 2.8 million tones of wheat and 280,000 tones of barley in these years and imported 7.5 million tones of wheat in 2000-2001. It was reported that 800,000 sheep and goats have died from malnutrition and disease in Iran in these years;

It was also warned that 60% of rural population might have to be forced to migrate to cities. The Iranian Government adopted a US $ 290 m emergency aid package to respond to the drought. But such a measure would not be always available to other developing countries;

Scientific researches warn that Central Asia will soon mark a decade of drought.

DROUGHT in Philippines

1. A recurring event in the climatic system defined as the lack of sufficient water supply to meet requirements
2. Causal Factor: Seasonal Aridity exacerbated by increasing incidence of El Niño
3. Impacts on: agriculture and fisheries sector, environment and natural resources; and socio-economic conditions

Overgrazing

--Overgrazing of steppe is a significant contributing factor to desertification in AP and it has been depleting grass cover in range that is fragile and low in plant density, coverage, diversity and productivity;

--In most of WA countries, the grazing density has been more than doubled over the past four decades.

--In Mongolia, nomads have been shifting livestock species from less exploitative species (cows and camels) to more exploitative species (goats) in order to increase revenues from livestock farming.

Dust and Sand storms (DSS)

--An increasing frequency and intensity of DSS are often cited as an alarm against accelerating Desertification;

--China has reported in recent years on the increased number of DSS incidents;

--Mongolia's records also show an upward trend in the number of DSS in Ulan Bator;

--Overall mechanisms of DSS occurrences have currently being examined from multi-disciplinary perspectives taking into account of recent climatic change global warming.

Water stress

- **Many countries face floods and seasonally arid conditions that hamper land productivity and aggravate land degradation;**
- **Level of run-off is significantly high and water-harvesting and optimal water distribution and usage remains an utmost priority for AP;**
- **Inefficient and mismanaged irrigation schemes have been causing water-logging, salinization and alkalization of soils;**
- **In India, water extraction exceeds recharge. As a result, water tables are falling throughout Punjab and Haryana States whilst in Gujarat groundwater levels declined by 90% during 1980's.**

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In China, a survey of 600 cities, 2/3 had inadequate water supplies and another survey of seven major rivers shows that nearly 1/3 of them registered the worst grade in national water quality standards, indicating that the water supply in these rivers are of very poor quality and has no practical use, not even for irrigation;

In 2006, more than 17 million people and 16 million livestock suffered from water shortage in SW China, caused by drought;

It is estimated that at least 1.3 million ha of agricultural land in the Sichuan Basin affected by water stress and 280,000 ha of crops were destroyed;

Significant subsidence has become prevalent in Manila, Jakarta and Bangkok due to increased water extraction. Salinization, inundation and saline intrusion are triggered by excessive water extraction that contributes to reducing soil nutrient and land productivity and accelerates desertification.

Soil erosion

Some areas are subject to acute problems of shifting sands (coastal areas of Viet Nam) and some areas to periodic inundation (Bogan, Myanmar) and water logging and salinity problems (NE Thailand) while landslides and slope instability present challenges in others (Philippines & Indonesia).

The island component of the SEA constitutes a unique patchwork of marine, coastal, island, terrestrial and agricultural ecosystems with great variations regularly occurring over small distances.

Soil erosion is an increasing problem in most parts of PNG. Fertile steeply sloping land can be easily overexploited and misused, leading to accelerated soil erosion. Many soils, especially those under subsistence farming, are subjected to fertility depletion due to decline in soil organic matter, soil leaching and soil acidification.

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Excessive mining and agriculture chemicals

--Extensive mining and misuse of agricultural chemicals cause destructive and toxicological problems in the local environments;

--Mining activities caused serious chemical pollution to land and water resources;

--With the poor application techniques and inefficient use, considerable portions of the chemicals do not reach their targets and the residue contaminate land, water and air;

--These chemicals can also be leached into drainage system causing pollution of surface and ground waters;

--The continued use of agricultural chemicals may lead to build up of pest and diseases resistance, which becomes a major problem in food production and safety.

Threats to Biodiversity Conservation

--Threat to biodiversity conservation is likely to increase due to the combined effects of climate change, land-use change and globalization;

--Species diversity in island countries in terms of numbers, richness and variety is considered limited due to its size and isolation (SPREP, 1999);

--Conservation of endemic flora and fauna and sustainable use of all land resources is therefore critical. In many parts of island, primary and regenerating forests have now been replaced by fern dominated shrub-land signifying low soil fertility and structure decline;

--Major threats to island biodiversity is a combination of continued clearance of forests, hunting pressures on coconut crab, fruit bat and pacific pigeon (access is increased as land is cleared).

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Challenges

Natural factor--Natural disaster

--Natural disasters such as droughts, mass landslides and floods, over the years, have caused considerable environmental damage, loss of life, damage to national economy and suffering to the lives of peoples in AP region.

--FSM is affected by typhoons, droughts, excessive rainfall and extreme high tides usually associated with El Nino Southern Oscillations (ENSO), frequent soil erosions, landslides, salinization and inundation of low lying coastal areas and swamp taro patches.

--Prolonged droughts associated with ENSO events is contributing to increased wild bush fires which is causing increased surface runoff, topsoil movement and soil infertility.

Climate change

--Climate changes contribute to changes in biogeochemical cycles, alter hydrological cycles, and worsen eco-balances and Complexity;

--These environmental impacts at local levels will certainly affect food security, tourism, transportation and the sustainability of agricultural and forest activities, alterations in surface runoff dynamics, lowering of groundwater tables, impacts on rates and types of land degradation, and reduced biodiversity;

--It is also known that land degradation and land use changes can potentially affect both local micro-climate and global warming;

--These conditions reaffirm the close links between climate change and land degradation.

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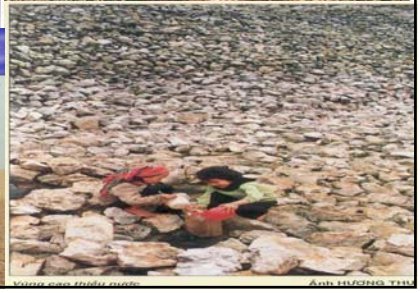
Nạn phá rừng trái phép

Đất bị xói mòn ở miền núi phía Bắc

Cát di động ở duyên hải miền Trung



Global Warming risk

--Four greatest anticipated consequences of any global warming and climate change are expected to be sea-level rising, an increase in climate-related natural disasters (storms, floods and droughts), disruption to agriculture due to changes in temperature, rainfall and winds, and less resilience of forests subject to greater pressures;

--Areas under most threat have been identified as marine ecosystems, coastal systems, tourism assets, human settlement and infrastructure;

--The Pacific SIDS are very vulnerable to impacts of global warming. Many of islands are of inundation, loss of fresh water or devastation due to more violent weather.

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Infrastructure

Tourism industry and wholesalers and retailers in many developing countries depend to a large extent on quality of basic infrastructure. Even in primary industries sectors such as agriculture, pearl farming and fisheries, require access to timely information about market supply and demand, as well as utilities, transportation, processing and ports facilities. Infrastructure, utilities and transportation development have been difficult due to limited capacities, lack of capital investments and rising cost of plant and materials, resources, maintenance, and services. Damage to infrastructure from severe climatic events has also contributed to increasing costs for developing and maintaining them.

Sea Level Rising

--Atolls in the Pacific have been lost due to rising seas. Coupled with El Nino, the results have included water shortages and drought in PNG, Marshall, FSM, Samoa, and Fiji;

--Kiribati and N Cook Islands became wetter. Fiji and Tonga became drier; Samoa and Kiribati became warmer and cloudier; Fiji, Tonga and S Cook Islands became warmer and sunnier. Kiribati and Tuvalu became sunnier;

--It is observed over years that sea level in Kiribati is rising and areas of coastal land are increasingly being eroded into the sea;

--Coastal erosion also gradually removes coconuts and other important trees that people rely on for food and income;

--"Best estimate" of sea level rising is 0.18-0.59 m by end of the Century;

--Frequency of cyclones, floods/droughts/soil erosion have dramatic impacts on all islands, especially the coastal communities where most islander's live and current impacts are marginal.

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Drought Mitigation

--Due to climate change trends, drought/reduction of freshwater resources are becoming main issues in SIDS.

--Over past 15 years, drought has caused significant degradation to terrestrial ecosystems that in turn are closely related to marine ecosystems.

--During the 1998 ENSO event, Palau had the lowest rainfall recorded in 100 years. During periods of drought, water shortages are frequent events in Koror and therefore rationing is implemented to conserve water.

--It is critical to improve storage and distribution of water for future droughts as well as to develop an action plan for fire prevention.

Invasive species

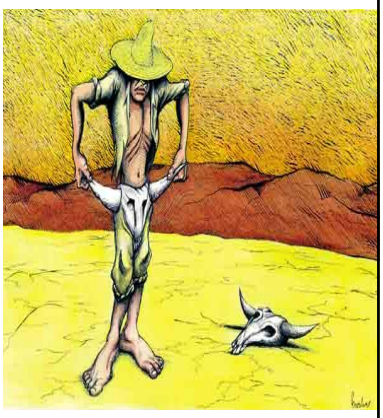
Invasive species are second largest threat to global biodiversity after habitat loss. In many SIDS, invasive species are greatest threat to biodiversity and a region-wide challenge to AP, driving environmental change, affecting water availability, and under-mining AP's ability to meet MDGs and other efforts to reduce extreme poverty/hunger (GEO 2007).

Palau's lack of adequate quarantine regulations to accommodate this trend has caused significant introductions of invasive species. According to IUCN's latest report, Palau is host to ten of the one hundred worst invasive species. Introduction of exotic species to Palau has risen markedly during last 50 years have become more efficient.

These non-native species have been causing harm to agriculture, biodiversity, and integrity of natural areas.

Economic aspect: Poverty

AP suffers from poverty. Recent indications show that poverty has increased significantly. As a response to this, the governments have increased their assistance to poverty alleviation in upgrading programs in all countries. The vicious cycle of poverty can easily be inherited by subsequent generations.



Combat desertification =combat poverty

Uncontrolled beach sand mining

Growing need for sand and aggregates for use in building construction has seen a proliferation of mining activities along beachfronts and initiation of commercial dredging activities. These activities also contribute to coastal erosion and loss of land. Enforcement of regulations that control beach mining has been difficult as many of the small scale activities are located in privately owned and customary land in which most of these activities carried out after working hours, weekends and midnights to avoid regular inspections by Environment Inspectors. Some state-owned companies and Public works department in the Pacific usually to be major building materials mining sector at a large scale.

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Social aspects

Legislative and institutional frameworks

Facing serious facts of some elements of land degradation issues, FSM have formulated recently FSM Sustainable Development Plan (SDP) and Integrated Development Plan (IDP), in addition to other plans already in place. The specific mainstreaming of adaptation to climate change and land use planning into all sectors of SDP is one example of initiatives undertaken by FSM since 2002. When completed, FSM NAP to implement the UNCCD and to rehabilitate land degradation will be integrated into FSM SDP.

Education and Awareness Raising

Education and training is a priority in nation building as it is medium for nurturing a well educated, high skilled, motivated labor force, as well as responsible citizens with high moral and ethical values. Governments of AP are focusing on raising education standards in rural schools. And also education needs to be aligned to technology developments and future skill demands such as Information and Communication Technology;

Technological Assistance

In many countries, there is still shortage of technological assistance for their development. It is envisaged that at completion of National Capacity Self Assessment (NCSA) and implementation of GEF's Sustainable Land Management Portfolio Project, a clear scenario of specific and priority capacity needs as well as technical assistance will emerge.

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Urban population growth/Urbanization

Perceive prospects of jobs, income generation, better access to medical facilities and better education have led to an unsustainable high rate of urban migration. The challenge for government of affected countries in AP in medium term is to manage causes of rural –urban drift, promote rural development to address urban social problem;

Influences of land tenure

It is acknowledged that environmental damage or degradation is accelerated by or is a result of underlying socio-economic and political "realities". Land tenure conflict, downsizing of the government employment sector, increased immigration, improved quality of life, increased cost of production, availability of modern machinery have all in various ways resulted in increased pressures on land and soil resources. Both scenarios combined with current land practices are threatening biodiversity and soil resources.

Environmental aspect

Environment vulnerability

Almost AP states face some serious environmental problems that are accelerated by ineffectiveness with which they are being treated. These particular problems include natural disaster, degradation of land resources, climate changes and drought, increasing risk of flooding and inundation to coastal settlements, unsustainable exploitation of marine resources and sewage water and waste management problems.

AP is very unique in its geography, ecosystems and natural resources endowment. Arable land is a very scarce resource and people are suffering from drought effect, vegetation degradation, soil deterioration and erosion, land unproductive. In AP, vulnerability to natural disasters and economic shocks are main issues confronting them in relation to sustainable development.

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Many AP countries are also facing environmental vulnerability because of the fragile ecological condition, poverty in the affected areas, possibility of climatic-induced droughts, and the challenges ahead are still huge since desertification issues threaten livelihood and environment.

Mongolia is a landlocked country with sharp continental climate, and low precipitation and strong DSS aggravates risk of desertification.

WA suffers from environmental vulnerability due to harsh environment condition, fragile ecosystem and distribution of marginal lands. Climate in WA is special and unusual Mediterranean climate and it is very vulnerable to wind water erosions and other environmental issues. Most marginal lands in WA are permanent pastures of 1.35 million km^2 and 85% of them are considered to be in danger of desertification.

Improper waste management

Population growth, business activities and increasing reliance on imported items is having its toll on the atolls' environments. Improper dumping of solid waste, littering and careless disposal of pollutants is posing a serious health risk to atolls inhabitants. Toxic leachate from rubbish heaps and dumps as well as careless spillage of oil/toxic pollutants are finding their way down to water lens.

To date, inappropriate waste disposal on islands of the Pacific is long standing problem along with rapid increase of population. Agricultural and industrial activities pose significant contaminants at many sites. Ground water proved to be contaminated with hydrocarbons due to dumping of waste oil and diesel. Polluted water is no longer usable and edible or as for subsistence needs.

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Increasing Population

AP is most densely populated region that has been influenced by desertification in the world. With fast economic development in AP, rapid population growth is placing ever-increasing demands on land, clearing natural vegetation and tilling without fallow or nutrient replenishment, putting pressure on land and natural resources in AP;

Population growth in **AP** of past 40 years has increased demand for agricultural land and consequently has put a significant amount of pressure on arable land. This has resulted in land degradation, reduced productivity, lower yields, reduced food security and an increase in poverty.

WA is considered to be having one of the highest annual population growth rates in the world, 2.4%. It is not surprising that population pressure in particular may be forcing further expansion of cropland and permanent pastures at expense of forest and woodlands;

SA has a much higher population density and always has severe land pressures. With population growth, desertification is worsening and facing a big challenge nowadays. Growing population in India and Pakistan is placing great strains on natural resources in arid lands of SA;

Pacific is also facing population pressure on land and natural resources. In Fiji and FSM, much of arable land has been taken up for housing, industrial, commercial developments, settlements, infrastructure and agricultural development for meeting needs and demands of its growing population. Within 25 years, native forest upland of Pohnpei Island has been reduced from 42% to 15% of its total forest land for agriculture development and has resulted in accelerated soil erosion and severe land slides.