

SEPLS in Timor-Leste and government initiatives to promote their sustainable management

By

Marcal Gusmao, Ph.D.

ABS Focal Point of the UNCBD, Ministry of Commerce,
Industry and Environment and
National University of Timor Lorosa'e

Background



- Timor Leste ($\pm 15,000 \text{ km}^2$): full independence in 2002
- It is located northwest of Australia in the Lesser Sunda Islands at the eastern end of the Indonesian archipelago.
- One of the biodiversity hotspots in the region both in the terrestrial and marine biodiversity
- In the terrestrial sites, new endemic species have been found (next slide)
- In the marine sites Timor Leste is part of the Coral Triangle Initiative that serves >75% of the global coral reefs

New plant species records for Timor

1. *Aglaonema marantifolia* (Araceae)
2. *Aglaonema marantifolia* (Araceae)
3. *Aglaia lancilimba* or *affin.*
4. *Alchornea rugosa* (Euphorbiaceae)
5. *Alstonia actinophylla* (Apocynaceae)
6. *Baumea rubiginosa* (Cyperaceae)
7. *Colocasia gigantea* (Araceae)
8. *Crateva religiosa* (Capparaceae)
9. *Dendrophthoe curvata* (Loranthaceae)
10. *Dimocarpus longan* ssp. *malesiana* (Sapindaceae)
11. *Euroschinus falcata* (Anacardiaceae)
12. *Ficus microcarpa* (Moraceae)

Land use

Category Land	Land Use/Cove	Area (ha)	Percent (%)
Forest Land	Dense Forest	312,930.67	21.2
	Sparse Forests	556,199.74	37.7%
	Very Sparse Forest	63,173.45	4.3%
Grassland	Grassland/Shrubs	403,247.22	27.4%
Crop Land	Rice Field	41,387.36	2.8%
	Dry Farm	22,152.57	1.5%
Settlement	Settlement	2,988.57	0.2%
Other Lands	Water Body	22,877.31	1.6%
	Bare Land	48,717.01	3.3%

Dense forest: Forest with canopy density more than 60%;
 Sparse forest: forest with canopy density between 20-60%;
 very sparse forest: forest with canopy about 5-20%

Source: Timor Leste action plan to combat land degradation, A draft report, 2017

Land use (Cont.)

- Agriculture activities employ most of the people
- Productive flat land located in the southern area of TL where it receives more rain compared to northern areas
- The middle range of the island of hills and mountains are increasingly under the pressure of the farming practices
- Causes various problems and challenges

Problems and challenges

- Expansion of agricultural practices into forest areas reduces land cover
- Annual deforestation was 1.12% but now increased to 1.7%
- Illegal cutting of trees (including mangroves) for fuel wood, construction and for urban development
- Illegal hunting wild animals including the Timorese deer
- Climate changes
- Creates vast soil erosion, land slides, flooding, sedimentation and disrupting socio and economic activities and lost of biodiversity

Species that may be threatened

1. *Antiaris toxicaria* – A deciduous tree common in the dry deciduous forest
2. *Neoalsomitra podagrica* (provisional id) – This peculiar Cucurbitaceous vine with a spiny, swollen base was common in dry deciduous forest
3. *Carallia brachiata* (Oi) – An occasional component of semi-evergreen rain forest and swamp forest but widespread in the region
4. *Cycas rumphii* – This taxon is listed by IUCN as Near Threatened and in decline and thus the remaining wild stands in conservation areas are particularly important
5. *Eleocharis geniculata* – a rare sedge and in the Lesser Sunda Islands only found in Timor

Role of MCIE

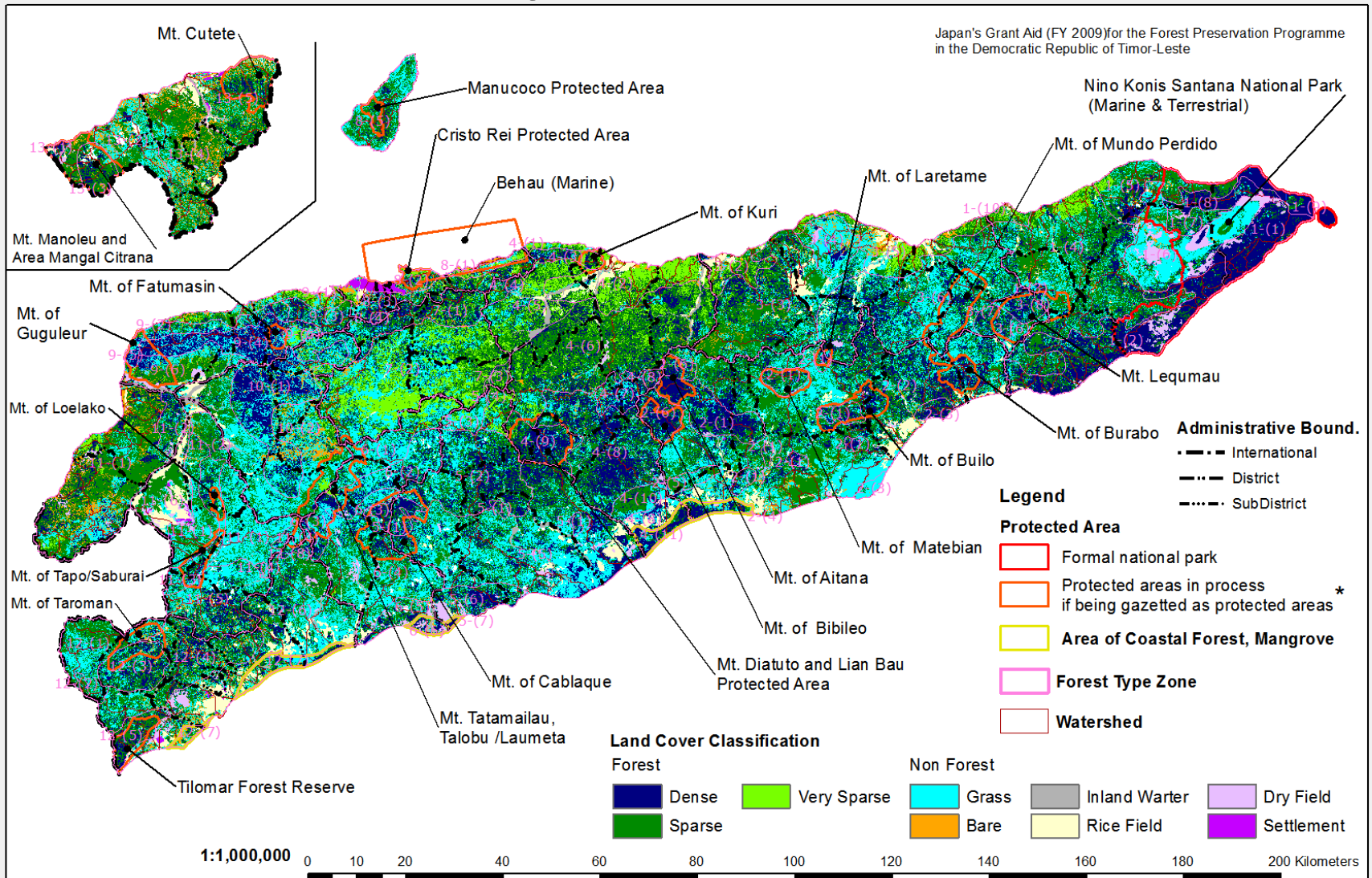
- Roles of the directorate general for environment as follows:
 - Protect and conserve environment and use its resources sustainably
 - Establish policy and legal frameworks
 - Public awareness raising to stakeholders (among Government Institutions and Civil Societies including students and communities)
 - Incorporate with other governmental institutions/sectors and non-governmental organisation as well as international agencies
 - Seek for partnership with donors in implementing environmental programs such as climate change adaptation and mitigation, biodiversity conservation (ecosystem services, ABS and wildlife protection)

Government initiatives

- One of the country's constitution objectives is
“To protect the environment and to preserve natural resources”
- Various laws and regulations and manuals in dealing with problems and challenges:
 - environmental basic law,
 - biodiversity decree law
 - Environmental license decree law
 - forest regime
 - forest policy
 - law for protected areas,
 - national policy for disaster management
 - manual for DRR management (launched on 10th July 2017),
 - NBSAP (5 priority strategies and 21 action plan), NAPA (9 priorities e.g. **food security**), UNABD and UNFCCC National communications, etc.

Biodiversity conservation Area

Japan's Grant Aid (FY 2009) for the Forest Preservation Programme in the Democratic Republic of Timor-Leste



Target for Conservation Area

✓ By 2023

- Approx. **73 %** of dense forests in the country will be protected by 2023;
- More than **53 % of the villages** located in and around the critical forests will be granted the long-term land use or forest management rights;
- Major parts of forests in at least **5 critically degraded watersheds** will be managed in a proper and sustainable manner.

Research on sustainable agriculture: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture(SDG Goal 2) and Climate Action (SDG 13)

- Increased population
- Increased human pressures on land use
- Climate change
- Reduces crop yield





Soil sampling for soil water content determination & plant measurement





Crop appearance at maturity



Kidney bean



Grass pea



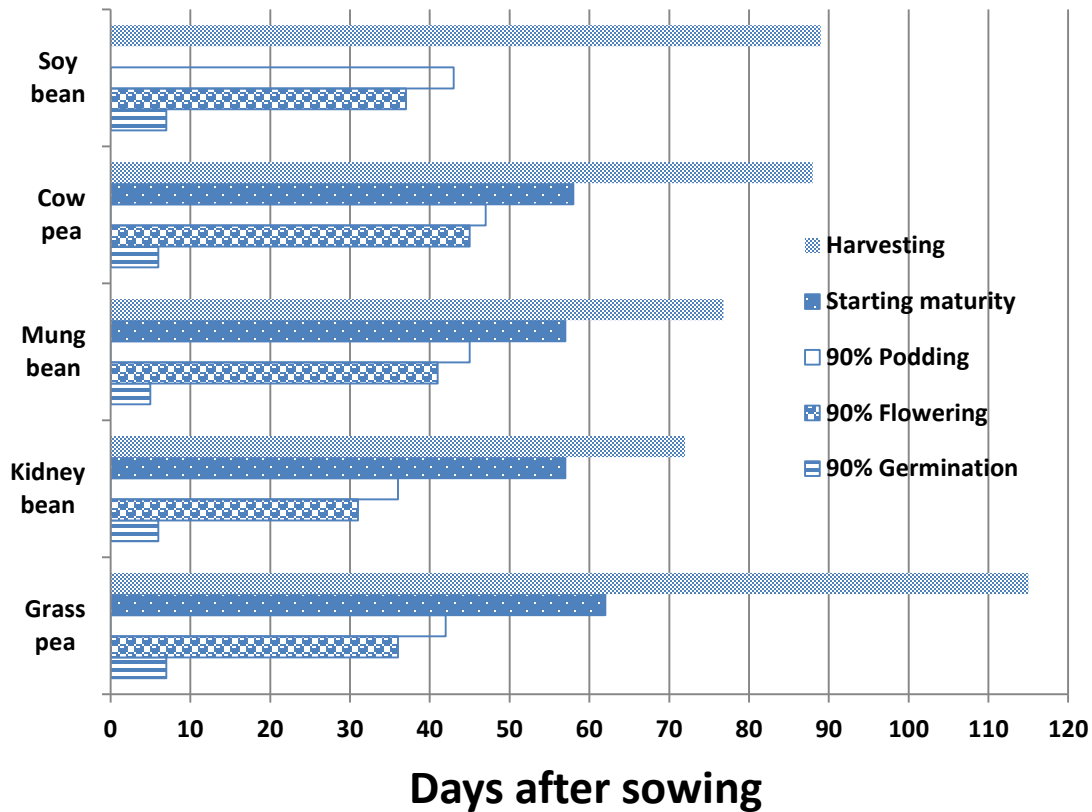
Mungbean



Seeds of grass pea

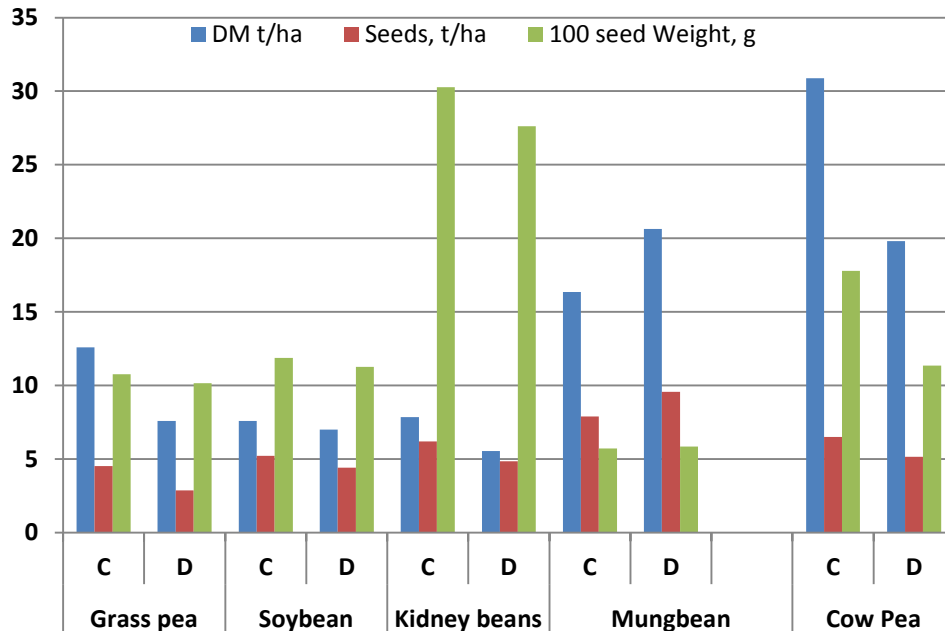


Crop phenology



- The fastest germination species was mungbean followed by kidney bean and cowpea
- Kidney bean was the earliest flower species in about a month from sowing
- Similarly, kidney beans set pod and reached maturity (70 DAS) faster than any other species
- Grass pea starting maturity in about 60 DAS but due to its indeterminate growth habit it took longer days to complete maturity

Yield and yield components



- Cow pea produced highest biomass of >30 t/ha © and the lowest beans of about 5 t/ha (D)
- The highest seed production was mungbean (approx. 9.5 t/ha) and the least yield was grass pea which was 2.9 t/ha
- This was due to high number in pods and seed per pod

Residues management for next cropping



Publications



- UNTL Deskobre Koñesimentu Foun
- September 6, 2016, **DILI, ANTIL News Letter**
- News taken during a field day participated by more than 100 people (students, staffs, lectures, MAF staffs, etc)
- **The study result was also presented at a regional IPSI workshop in Malaysia, April 2017**

Adoption by government

- The Ministry of Agriculture and Fisheries with financial and technical support from the government of Australia is initiating research on the same area involving socio and economic studies

Conclusion

- Geographically, Timor Leste is positioned in the transition of Asia and Australia and thus one of the biodiversity hotspots in Asia and the Pacific both in Terrestrial and marine areas
- In the terrestrial site, most of the lands are inappropriate but still use them for crop production leading to various problems and challenges
- The government of Timor Leste has developed various legal frameworks to implement the sustainable development in all sectors
- This includes technical research support on sustainable agriculture in enhancing food security and adapting to climate change

Thank you