

DR. LE CONG KIET; BOTANIST.
SUGGESTIONS for ECOSHARE – TRP ECOSHARE leases in PNG

- surveys on vegetation and flora;
- collection of plant materials;
- taxonomic expertise;
- list of species occurring in each conservation area;
- surveys on critical environmental threats;
- surveys on traditional plant uses;
- training of local staff in collecting, field description, identification, and the processing of duplicates;
- documentation;
- publications.

I- Mount MURRAY: Sekesu-Sisapi LGI Southern and Gulf Province

I.1-GENERAL OBSERVATION:

- conservation (approximately 54,000 ha total area);
- great wilderness area : lowlands, low hills, Pleistocene volcano;
- prominent volcanic outlier;
- little populated and little known;
- very heavy jungle cover;
- virtually undisturbed;
- extent of tower limestone, unstudied and botanically unknown;
- geological substratum, soil formation.

I.2-BASIC DATA:

1)-*geomorphology*:

Rugged topography:

a) ridges of folded Miocene limestone, alt. range: 0-1500 m a.s.l.;

b) deeply dissected volcano, erosional forms on volcanic cone plus lower fan-shaped slopes to the south:

-a lava cone (culminating at 2253m a.s.l.);

-crater (# 8 km diameter, the bottom at 970m a.s.l.);

-fan-shaped lava dejection (elevation from # 60m to # 700m a.s.l.) extending southward.

c) lowland area (general elevation 16m – 70m a.s.l.) at the southern end of the concession.

2)-*soil types* (compilation from literature)

3)-*high annual rainfall* (compilation from literature)

I.3-VEGETATION:

1)-*distribution and types*:

- on lava: altitudinal zones of vegetation on dejection cone slopes:

-low montane forests : from 1400 m up to the culminating point

- (2253 m a.s.l.) of the concession;
- hill forest from 800 m to 1400 m of elevation;
- upland forest (roughly from 200m to 800 m of elevation).
- on dissected topographies (limestone): ecologically important;
- lowland alluvial forests, complex, may be a mosaic with very varied botanical composition;
- riverine gallery forest;
- swamp forest at the S-E end corner (?)
- presence of savannah grassland (?)
- 2)-*forest succession*: effects of human impacts (mining, timber operations, gardening).
- 3)-*habitat preservation*: in case of the rare and geographically confined dipterocarp forest.
- 4)-*mapping* (?): hard and expensive work.

I.4-FLORISTICS:

- species diversity estimation: totally unknown;
- taxonomic and demographic composition of main forest types unknown;
- inventory of forest trees flora coupled with timber resource survey;
- expected greatest diversity of species and genera on well-drained lowland sites;
- presence of dipterocarps? great significance for the PNG flora;
- temperate plant families from 600m elevation upwards;
- presence (?) of : hoop pine, *Araucaria cunninghamii* ('religious and superstitious' reasons) and klinkii pine, *A. hunsteinii* (a PNG endemic species grow from # 500m up to # 2450m);
- elevational transition of the forest flora, nature of species turnover?
- important taxonomic plant groups;
- New Guinea Beech *Nothofagus*;
- herbs, sub-canopy trees, tree ferns, and especially climbers;
- limestone flora: poorly known from PNG, detailed studies should be made of its flora, possibly new species and new generic records;
- endemism :
 - generic level (84 in whole New Guinea);
 - species level: still rudimentary (# 60% of the plant species are endemic to the whole island of New Guinea); suspected a high degree of local endemism.
- species lists of the concession's area.

I.5-HUMAN SETTLEMENTS:

- very low population: the core zone virtually uninhabited;
- location of villages around its perimeter ?

I.6-PLANT USES:

- potential timber resources;
- food and medicinal uses.

I.7-PARTICIPATION of local land-owning communities:

- eco-tourism (small-scale, nature-based tourism) ?;
- local food harvesting (and production?): revenue source for local dwellers.

I.8-ECOLOGICAL ASPECTS:

- difficult to quantify an environmental service, the levels of scientific incertitude being high (20 to 40% regarding the life cycle of forest trees and carbon cycle).

II- MIDDLE SEPIK

II.1-GENERAL CONSIDERATIONS:

- large wilderness area with low human population;
- critical watershed: river meanders, oxbows, tributary lakes, marshes, and woodland swamps;
- ecologically sensitive, due to catchments of tributary rivers emptying into the Sepik;
- highly diverse aquatic and wetland flora.

II.2-BASIC DATA:

- 1)-topography & habitats: meanders, tributaries, lakes, hillside
- 2)-medium to high annual rainfalls
- 3)-sedimentation and turbidity of water (main river, lakes)
- 4)-flood depth, frequency and duration

II.3-VEGETATION:

Reconnaissance, typology and delimitation (mapping ?)

- 1)- rich lowland humid forests: composition and ecological dynamics;
- 2)- freshwater swamps: swamp forests (permanent, seasonal); swamp woodlands; swamp savanna; herbaceous swamps; river bank vegetation; river bed vegetation; special focus on vegetation dynamics in meanders;
- 3)- mosaic nature of forest formations: scale and pattern of forest patchiness?
- 4)- lakes: concentric and vertical zonation of vegetation;
- 5)- hillside: altitudinal zonation of vegetation; forest types; savanna; grasslands.

II.4-FLORISTICS:

- aquatic & wetland floras; special focus on rheophytes;
- upland flora: inventory of forest trees; climbers and epiphytes; ferns; orchids; myrmecophytes;
- plant biodiversity of lakes;
- Sepik: only known locality of *Ceuthostoma* (Casuarinaceae) in PNG;
- endemism.

II.5-PLANT USES:

Food, medicinal, cultural uses of native aquatic and wetland plants:

- check-lists;
- yam (*Dioscorea*) species and cultivars;
- traditional knowledge; current practices;
- promotion of “candidate” species for national and/or international markets as sources of revenue for local people.

II.6-HUMAN SETTLEMENTS & LAND USES:

- % of land occupation and uses;
- mapping of village’s locations;
- home-gardens;
- crop lands;
- cultivated staple foods.

II.7-ENVIRONMENTAL ISSUES:

- alien invasive plants;
- pollution (river and lakes);
- risk of contamination from Frieda river copper-mine;
- main threats on forest cover: timber exploitation;
- health of the Sepik hill forests → important to the river and its human cultures.

II.8-CONSERVATION VALUES:

- lakes;
- remarkable diversity of habitats and landscapes, from lowland to upland forest ecosystems;
- forest resources;
- cultural value of the site.

II.9-PERSPECTIVE:

- toward the reconnaissance of RAMSAR site?

FINAL REMARKS:

Great challenge to survey and study:

- large gaps in our knowledge of PNG's plant diversity;
- taxonomic problems: fundamental to the quantification of biodiversity;
- species database should be set up for the collection.