USING THE REMOTE SENSING TECHNIQUE TO ESTABLISH A LANDUSE MAP IN VIETNAM ON SCALE 1:1.000.000.

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Remote sensing technique have been using for establishing of landuse map on differece areas of Vietnam. This report will discuss about the result of this work which had been carried out for mapping on scale 1:1,000,000 for all territory of Vietnam after each 5 years.

I. SOURCES OF DATA:

* LANDSAT TM imageries FCC, scale 1:100,000, 1:250,000, (all territory), 1:100,000 for several parts.
* SPOT imageries of some key areas: Red river delta, Mekong river delta, middle part area of Vietnam. (date 1990)
* Landsat tape of landsat V on Red river delta, Mekong river delta (date 1989).
* Documents of the institute for forestry planning and investigation.
* Documents of the institute for agriculture planning and management.
* Imageries of NOAA and MOS I satellites (date 1993).

II. METHODOLOGY:

* Visual interpretation by specialists of institutes as: geography agricuture, forestry, cartography.
* Digital processing for some trainning areas (with software such as: PERICOLOUR, ERDAS, ACR/VIEW, ILLWISS...)
* Grouth truth collection on training areas and fastly checking.
* Comparing with documents of departments for land management.
* Cartographical methods: correction, location, coordinate transformation
* Classify ofjects base on categories of different map scale.

III. PRINCIPLES FOR ESTABLISHMENT OF LAND USE MAP:

`III.1 Establishe legend of the map:

* Principle for: establish legend which corresponding to map scale and suitable with study method.
* Requirement:
  - Fully reflect landuse units of the territory correspording to map scale and suitable to the National landuse clasification legend.
  - Express capacities for recognization, clasification difference objects on remote sensed data.

III.2 Map drawing:

- Reflect high- detailly with map contours and correct to the coordinate UTM map- net.
- Colour system is suitable to the traditional principles of the land use map.

III.3 Establish the commentary of the map:

- Adequate statistic the area and distributted characteristic of land use unit for each part of the territory administrative zone or district.
- Interpretation and comparate to the previously data for changing assesement of essentical landuse units.
- To point out corcerned problems of land using and propose resolutions to the management offices for the purpose that land will be suitable investigated and stability development.

IV. RESULT OF STUDYING:

IV.1 Map content:

Land units on the map have been distinguished to 4 groups and 25 units as follow:

100. Agriculture land
   110. annual cultivated land
      111. crop land
      112. pasture and interative agriculture land
   120. Longtime plantation land
      121. pasture and industrial plant
      122. shifting cultivated land
      123. orchard land
      124. other long-time plant

130. Other land

131. grass- brush land

132. water surface (lake and pond)

200. Forestry land

210. Evergreen forest

211. dence evergreen forest

212. average evergreen forest

213. sparse evergreen forest

220. Decidous forest

230. Mixed forest

240. Pointed leaves forest

250. Growth forest

260. Mangro forest

300. Special use land

310. constructed land and human settlement area

320. salt field

330. seage field

340. other specially land

400. Barren land

410. exposed rock

420. sand and gravel other than beaches

430. beaches

440. natural surface water

450. other non vegetated wetlands

Remark: By principle, detail level of the map: Contours with area of 5mm^2 are separated (corresponding to the area of 2,5 ha on ground). But, due to mixed condition between cultivated land and settlement areas on delta region, and on other, in mountain region, due to complicated condition of forest land, detail of contour will not be followed the principle carefully. That means, contour of land use units in these regions had been generalized, but still present correctly for natural condition.

IV.2 Characteristic of distribution and changing of land use

* Distributed characteristic of land use units:
  Calculation on the land use map of scale 1:1,000,000 land use distribution can be show on the below table (on next page).
* Changing of the landusing during recent 5 years:
  Comparize with documents of several years since 1985, 1989 and existing condition, landuse changing in Vietnam as follow:

- Forest land and humansettlement areas have been changed in all of regions of Vietnam, especially in the central plateau, East South region, middle part coastal zone.
- In forest land, growth forest area have been enlarged fastly, especially in low land and hilly land of the North and middle part.
- In present, bare land have been restricted but it is still rather large (41,24%) of the total territory.

It is the area for alot of problems of land used plant in Vietnam such as: reforestation, management and improving improverished soil, investigation wetland areas, catchment management...

Land use condition up to the year 1994

(unit :1,000 ha)

region	natural area	land is being used				barren land
		agriculture land	forest land	special use land	settlement area	
- Mountain and hill on North part	10297	1326	2175	245	220	6331
- North part delta (Red river delta)	1251	695	59	225	115	157
- North middle part	5118	701	1570	162	97	2588
- Coastal zone of middle part	4578	521	1620	152	105	2180
- Central plateau	5557	725	3450	115	82	1385
- East part of the South	2345	1036	562	197	168	382
- Mekong river delta	3956	2790	170	192	175	629
Total	33102	7594	9606	1288	962	13652

CONCLUSION:

- Using aerial photography, checking in training areas, interpretation with difference remoted sensed data: KOSMOS, LANDSAT, SPOT, NOAA, MOS I, IRS... give capacity of having hightly correction on the landuse mapping.
- Using difference remote sensing data give a facility method to fastly management landuse process. This work is very useful and have been publicized for land use mapping in difference scale: it will be more useful if we have multitemporal data, multidata... but, it is the most difficult for us in present.