

The results of soil survey of rapidly changed city of soil information data in South Korea

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Abstract

By decreasing arable land rapidly and increasing urbanized and intensively developed areas, previous soil information should be changed to reflect present conditions. In order to revise old soil information to new ones, utilizing satellite image is easy and quick. This result was obtained as followed results. Yongin and Namyangju city have very abruptly changed soil information because of increasing urbanized. We examined soil of those areas. We made maps (paddy, upland, orchard and green house) of landuse in Yongin city. The results were similar to agricultural and forestry statistical yearbook k (2007). This method could be used the agricultural and forestry statistical yearbook in the future. Soil was resurveyed in Yongin municipality in Gyenggi province in 2007. The numbers of soil series were increased from 65 to 71. And the numbers of soil phases in Yongin increased from 159 to 170. The drainage classes were changed by readjustment of agricultural land and arable land that have changed to factory, house and road etc. The area of arable land (paddy, upland, orchard etc.) was much decreased compared to the super-detailed soil survey of upland in Namyangju. It had decreased by 439 ha of paddy, 317ha of upland and 717ha of orchard. The area of Jinjeob meon and Jingeon eup were mainly changed into areas of green house. The type of agricultural Anthrosols was mainly cumulated soil dressing. A new soil series was called the Jijeb soil series. The classification of Soil Taxonomy was coarse loamy, mesic family of Streptic Udorthents. Paddy has changed into urbanized area, cultivation of green house and fallowing as revealed by soil surveying in Namyangju. Moreover, the drainage classes of soil have changed to even worse conditions because of interception of flowing water owing to road construction etc.

Key Words

Yongin-city, Namyangju-city, soil survey, landuse.

Introduction

A soil map is a very important thing for managing soil resources properly. The Republic of Korea continued to soil survey from 1964 to now but because of rapidly decreasing arable land and increasing urbanized and intensifying developing areas, soil information has changed to present. The sample cities were Yongin and Namyangju which were very abruptly changed with respect to soil information because of the increasing urbanized area. We examined soils of those areas. We made maps (paddy, upland, orchard and green house) of landuse in Yongin city. In order to relate old soil information to new ones, satellite images provided an, easy and quick procedure.

Materials and methods

In order to revise and update old soil information data, especially arable land turned into urban and development areas, we should revise soil information data. The investigated areas were Yongin and Namyangju city which were abruptly changed recently. Base maps were aerial image and topographical map(1:5,000 scale). The main investigated items were landuse and area of past and present, soil information especially current paddy soil. We analyzed topography, soil drainage classes, soil texture, etc. Anthrosols were examined by methods used for soil and plant analysis (NIAST 2000)

Results and discussion

Table 1 shows the changing area of land classification according to year in Yongin city. The area of paddy had decreased but others(urbanized area, etc) had increased.

Table 1. The changing areas of land classifications according to year in Yongin city (Unit. ha).

Division	Paddy	Upland	Forest	Others	Whole
1990 (Soil interpretation map) ^A	10,484(17.3)	7,834(12.9)	37,257(61.6)	4,939(8.2)	60,514(100)
1999 (Statistical yearbook)	5,229(8.8)	8,668(14.7)	34,721(58.7)	10,521(17.8)	59,162(100)
2005(Statistical yearbook)	4,812(8.1)	8,140(13.8)	33,461(56.6)	12,732(21.5)	59,145(100)

^AThis area was classified by soil interpretation map of 1999 in Youngin city.

Table 2 shows soil types according to investigation year. The soil series increased from 65 to 71, soil types from 81 to 87, and soil phase from 159 to 170 comparing with 1997 to 2008.

Table 2. Soil types according to investigation year.

Year	Series	Types	Phases	Remarks
1977	39	56	58	Detailed soil survey. Not surveyed Mt. soils
1999	65	81	159	Highly detailed soil, survey of upland
Present('08)	71	87	170	Resurvey of paddy in 2000 ^A

^AResults of soil survey (11,000ha, Paddy soil mainly) : Ogcheon, Cheongweon, Hwasu, Baeggu, Daegu, Shinbul series(New series in Yongin city)

Table 3 shows soil information of a resurvey in Yongin city and changing area of landuse. Change from paddy to others affected drainage classes (64.1%) and landuse (63.3). Reasons include better irrigation system construction and factory, road construction.

Table 3. Soil information of resurvey in Yongin city and changing area of landuse.

Division Soil properties	Number of changing soil information polygon (Total 256)						
	Topography	Texture	Drainage classes	Av. soil depth	Gravel	Slopeness	Landuse
Numbers	44	40	164	44	7	83	162
Ratio	17.2	15.6	64.1	17.2	2.7	32.4	63.3

※ After readjustment of arable land and construction of water facilities for irrigation, soil drainage classes are better than in the past landuse of other soils has changed to urban, factory, road, etc.

Table 4 shows the changed soil information for soil resurvey results of paddy in Yongin city. As an example of Seogcheon series (this was paddy soil), changed to other soil series because of enlargement scaled (from 25,000 to 1:5,000) and landuse changed from paddy to urban or greenhouse.

Table 4. The changed soil information by soil resurvey results of paddy in Yongin city.

Topography	Soil series of old data (paddy)	No. Polygon	New soil series of resurvey and landuse
Alluvial plain	Seogcheon(SEP)	16	Cheongweon, Docheon, Eungog, Jungdong, Jisan, Jigog, Maegog, Noegog, Sachon, Shingheung, Yongji, /paddy, urban, upland, greenhouse
	Cheongweon(CwP)	2	Sangju, Shinhueung/upland, paddy
	Geumcheon(GMP)	8	Seogcheon, Gangseo, Hwabong, Jungdong, Sachon, Shindab/paddy, upland, urban, reservoir
	Gacheon(GqP)	2	Deogcheon/urban, greenhouse
	Gangseo(GtP)	5	Seogcheon, Jungdong, Docheon, Noegog/paddy, upland, greenhouse
	Gocheon(GzP)	1	Jigog/upland
	Hoegog(HEBP, HECP)	21	Hoegog, Jigog, Maegog, Noegog, Osan, Yecheon, Samgag, Weolgog/urban, paddy, upland, barren, reservoir, grassland
	Shinheung(ShP)	2	Gacheon/greenhouse
	Shindab(SnP)	9	Seogcheon, Docheon, Geumcheon, Hwabong, Hamchang, Hwasu, Noegog, Shinheung/paddy, upland, urban, greenhouse
	Subug(SpBP)	3	Hoegog, Maegog, Sacheon/paddy
	Hamchang(HhP)	6	Geumcheon, Docheon, Sangju, Seogcheon, Shinheung/paddy, urban, greenhouse
Diluvium	Hwadong(HjBP)	3	Gopyeong/orchard, greenhouse, urban
Fan	Haggog(HYBP)	1	Seogcheon/paddy
Mt. Footslope	Yeongog(YcBP)	2	Pungcheon, Sachon/urban, paddy

Conclusion

The number of soil series in Yongin city increased from 65 to 71. And the numbers of soil phases in Yongin increased from 159 to 170. The drainage classes were changed by readjustment of agricultural land and some arable land has changed to factory, house and road. The area of arable land (paddy, upland, orchard, etc.) was much decreased based on the super-detailed soil survey of upland in Namyangju. The decrease was 439ha of paddy, 317ha of upland and 717ha of orchard. The area of Jinjeob meon and Jingeon eup was mainly changed from paddy into areas of green house. The type of agricultural Anthrosols is mainly due to cumulated soil dressing. A new soil series the Jijeb soil series was established Its classification in Soil Taxonomy is coarse loamy, mesic family of Streptic Udorthents.

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