Water Environment in Shimabara Peninsula -Water and Material cycle in the Intensive farming area on the volcanic edifice-

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1. Introduction

The excess rate of environmental standards with the nitrate nitrogen is too high as compared with other items. The water pollution of the nitrate nitrogen because of the influence of manure to farm products is remarkable, and is admitted in the agricultural region in various places . Therefore, the research that an uncertain point is a lot, and is detailed is still waited for as for a mixture route, time, of the river water and underground water spatial change and outflow process(Saito et al. 2005). To solve the problem, it is necessary not to see a narrow pollution object alone, also the matter cycle in the connection of Mountain, river, and sea as background, is kept in mind on the assumption of the water circulation each valley. Therefore, the directionality of environmental preservation in the future and an excellent water environment reproduction was considered in this research for the Nagasaki Prefecture Shimabara peninsula thought that the nitrate pollution was especially remarkable.

2.Study Area

The Shimabara peninsula is located in the Nagasaki Prefecture, and its comprized of 24km in east and west,the south north 32km, and 459.49km^2 in the area.Shimabara City has a a lot of spring water and the flowing well. But it was dameged from the eruption activity of Mt.Unzen that had started in 1991.And also, its one of most intensive farming area in Nagasaki Prefecture, therefore pollution with the nitrate nitrogen is confirmed in a part of the spring water that springs up abundantly everywhere in the peninsula.Moreover, there was a district where with underground water as the source of water supply, too and the nitrate nitrogen decrease plan was settled on from requiring the emergency in October, 2006.

3. Methods

The hydrological observation was done for the period on November, 2006 from April, 2005 for the whole area of the peninsula for the river and the spring water, and about 100 points were surveyed about one investigation. The density of the main ion and the silica was analyzed in January and August, 2006. Moreover, the altitude, the geologic map, the land-use map, the agricultural arable land area, and the number of livestock were overlapped by using GIS. We tried it related to the state of land in each valley, and consideration of the season change.

4. Results

The density such as the nitrate nitrogen in underground water has risen from the agriculture livestock industry active, the living drainage processing rate low in the Shimabara peninsula. It is guessed that it contributes to the pollution of the surplus nitrogen shallow underground water by the manure of active agriculture a lot by advancement by development in the farmland by a land improvement and new creation that is still progressing to the reclamation of drain and the stock raising waste from a lot of stock raising bases distributed in the upstream region and them now. Moreover, a water quality characteristic different according to the region was admitted, and the value of the nitrate nitrogen in the river was especially remarkable in northeastern and southwest.

5. Conclusion

A remarkable region to pollute existing became clear though the problem of the nitrate nitrogen pollution of the volcanic zone with a complex underground water system that extended to the reticulation was more difficult than that of another region. It is necessary to monitor the water environment to underground water that exceeds nvironmental standards steadily.

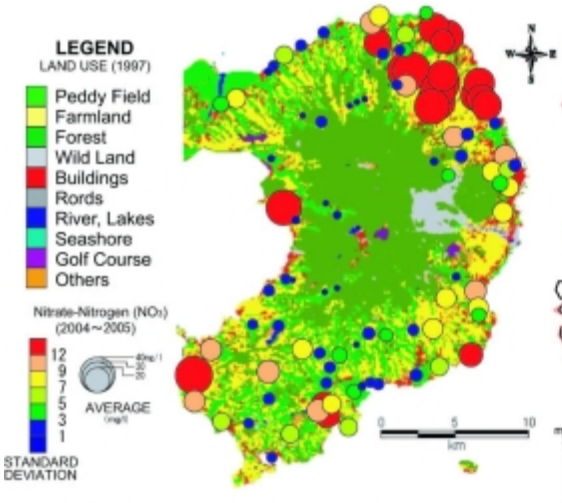

Fig.1 The relationship between Land use and Nitrate-Nitrogen

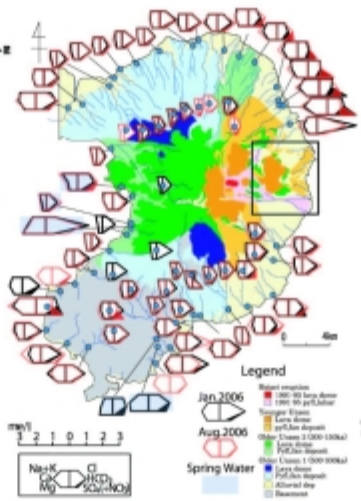

Fig.2 Water quality in Shimabara Peninsula

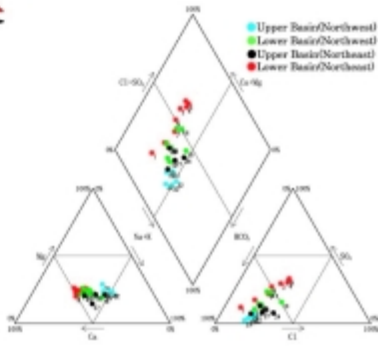

Fig.3 Trilinear Diagram