

Change of the Hydrological Environment in the Urban Area

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(Viewpoint) If a natural area is urbanized, and more advanced urbanization takes place in an urban area, it is known that the hydrological environment in a natural area will be a large change. If the change is seen roughly, there are two, the thing in connection with the outflow of a river and the thing in connection with ground water. On a concrete target, the former change is shortening of runoff time, the increase in a peak discharge, reduction of the amount of base flow and so on. The latter are land subsidence, salinization of ground water, generating of thin air and so on. They are called the so-called ground water obstacle. These change came after the Second World War, came to be known, and became especially remarkable after the economic high-growth era.

However, change came to take place also to many of these phenomena in recent years. A big change took place especially about the latter.

Then, change of the hydrological environment in an urban area is serially surveyed mainly for the time after the Second World War.

(Change of the earth surface) Urbanization can be regarded a change of earth surface in hydrology. The land where bare land and vegetation grew thick was specially developed, it became a residential section etc., bare land decreased, and vegetation was removed. Moreover, the land use as a paddy field or a field changed to commercial area or residential section. Consequently, earth surface came to be covered with the quality of the material it is hard to make rain water, such as a building and a road, permeate.

Change was seen also in the water area. Reduction in farmland reclaimed land from the farm pond which became unnecessary, and public facilities such as a school, were built there. Moreover, the winding river was straight-line-ized and the bank was built. The damp area around a river was used for the industrial site etc. River-bed was hardened with concrete, and the sharpe bank divided the protected lowland and riverside land. The sewer was built by the both sides of a road and drainage of a road was led to the sewer through there.

(Change of runoff) Consequently, change of above many took place. That is, the above flowed out and shortening of time was caused. And drainage came to concentrate on a lowland part simultaneously. On the other hand, in an urban area, it becomes easy to generate a heavy rain local for an urban climate. For this reason, flood disaster(landside inundation) came to occur in the urban area. Recent years come and various measures(Unban Oasis Design etc.) came to taken to this flood. However, this kind of flood is generated in an urban area in spite of it like an every year.

(Ground Water Obstacle) Change has taken place also to ground water. Population and industry concentrated on the urban area after the Second World War, water resources were very insufficient for the degree there. A long distance dam and the ground water in an urban area were asked for the water resources. In the urban area, the remarkable fall of the ground water level was caused as a result of too much ground water pumping. For this reason, land subsidence accelerated further and it became a big social problem. The pumping regulation of ground water performed as a measure against land subsidence obtained the big effect. However, pumping regulation causes the rise of the ground water level and various problems came to generate it. Moreover, land subsidence is generated newly or ground water obstacles, such as salt-water-izing of the ground water in near the seashore, still remain.

Thus, it can be said that the hydrological environment in an urban area has changed with time.