1. AMOUNT OF PRECIPITATION

2. DISPERSION OF PRECIPITATION

1. Amount of Precipitation

Precipitation is the general term for the substance which falls on the ground surface in the form of rain, snow, sleet, and hail as a result of the condensation of water vapor in the air. The amount of precipitation represents the volume in water form. The amount of precipitation is observed at various locations in Japan, and the amount of precipitation during the preceding 24 hours is recorded. This recorded figure is shown in units of 0.1 mm and represents the amount of precipitation for the previous day.

Precipitation differs to a great extent, depending on the region, with marked differences in local areas. There also is a wide degree of the dispersion of annual changes in the monthly or annual amount of precipitation. Its norms, unlike those of mean temperature, are used mostly as a yardstick.

There is heavy precipitation in the areas on the Pacific Ocean side, such as Kyushu, Shikoku, and the Chubu area, from June through August, whereas the amount of precipitation from snow is great in the districts on the Japan Sea side from March to May. On the other hand, the amount of precipitation is small in the island areas, including the eastern part of Hokkaido, the Tokai and Kansai areas, and the northern part of the Kanto Region; the basins, including Hokuriku, Nagano and Kochi; and the areas facing Seto Inland Sea. (Okada et al., 1972)

A check of the annual changes in the amount of precipitation shows that much of the rainfall occurs during the rainy seasons in June and July and during the long periods of rain in September and October. Occasionally in August, heavy rains also occur on the Pacific Ocean side brought about by typhoons and typhoons. The amount of precipitation from snow is extremely great on the Japan Sea side, whereas heavy rainfall is frequently registered in southern Japan in April and May.

Precipitation differs not only in intensity and duration varies each time. The daily amount of precipitation exceeding 50 mm conceptually represents a day of much rain in a broad sense. The daily amount of precipitation as well as the hourly amount of precipitation are the elements which must be taken into consideration for city planning and also for designing riparian flood engineering and construction projects since there is a need for drainage. The daily precipitation for the 10 year return period represents the amount of precipitation which may be expected once every 10 years on the average. On the basis of the data on the amount of precipitation in the past, the return period is calculated by the method of N = 251 / (r - 1), where N is the number of years for statistics, r the ranking integer of the annual maximum daily rainfall amounts in the order of the series of N samples beginning with 1 for the greatest, and r the empirical return period which corresponds to the precipitation for r.

The 1,660,000,000 mile square maps showing the amounts of precipitation were compiled from the data for the 30 years registered by climatological stations at 1,300 points all over the country. With respect to Okiwara Syoud, Ishimura Syoud, Komanuma Ts, and Osakado Ts, the observed values were rectified before 1951 and those for neighboring areas were corrected to rectified norms since the norms for the period from 1861 through 1870 are not available.

Sources

2. Dispersion of Precipitation

There is a wide degree of dispersion of annual changes in the monthly or annual amount of precipitation. To indicate this dispersion, the Japan Meteorological Agency has prepared tables of values for each classification by the quintile grouping method on the basis of statistics covering 30 years.

In the quintile grouping method, the values of samples are put in the order of magnitude and then classified into groups, each containing one-fifth of the total number. The classifications divided under the quintile grouping formula roughly have the following qualitative implications:

- Classification I: very light,
- Classification II: light,
- Classification III: medium,
- Classification IV: heavy,
- Classification V: very heavy.

As regards the question of what classification may be used for the amount of precipitation in a given month, for example, to evaluate the quintile grouping formula, the probability theoretically stands at 8.2%, so that the probability for Classification 1 is 6.4%.

The maps were printed to indicate the range of precipitation for each month on the basis of classification. The range of classification 1 is from the bordering value between Classifications 2 and 3 and the border of Classifications 3 and 4, i.e., the range of classification was looked upon as the range of precipitation. The ranges were indicated, while the difference between the maximum and minimum values, i.e., the ratio of appearance of Classifications 2, 3, and 4 to the ratio of appearance of all classification was looked upon as the ratio of dispersion.

For example, when the range of precipitation and the ratio of dispersion are calculated from the amount of precipitation in Okinawa covering 30 years, they are 500 mm and 50% in January and 80 mm and 60% in June, respectively.

By region, the greater the amount of precipitation, the larger the range of precipitation. By month, the range of precipitation is larger in a month which has a greater amount of precipitation. Even at the points which have similar amounts of precipitation, the range of precipitation differs to a considerable degree, depending on the point.

The ratio of dispersion is small (20-30%) suggests the possible appearance of a year registering an amount of precipitation three to five times the value of Classifications 2-4. In such districts, there may be springs with a very large or a small amount of precipitation.

Sources