6.4 Wadi-bed Infiltration Capacity

The lack of concurrence of rainfall and runoff indicates the great capacity of wadi-bed infiltration; however, only 2 runoff events sighted below were available to estimate the infiltration capacity.

(1) Rainfall and runoff on Aug. 25, 1984

On August 25, 1984, rain gauge RK3 at Al-Hijir recorded 43mm rainfall for the day. It is located upstream of the Wadi Bani Kharus water-shed. Among the other rain gauges near RK3, only at RK2 (Al-Awabi) was 1mm/day observed. The rainfall seemed to be a typical isolated rainfall. The runoff from this rainfall came down to the point near WK3 (Al-Awabi), but did not reached the wadi gauge section.

Based on this data, the infiltration capacity of the wadi-bed can be calculated as follows.

(Total Rainfall Amount)

$18.7^{km2} \times (43-2)^{mm} = 766{,}700^{m3}$

where Controlling area of RK3: 18.7 km^2

Primary evaporation from the base-rock: 2 mm

(Infiltration capacity of the wadi-bed)

$766{,}700^{m3} \div (20^{km} \times 15^{m}) = 2.56^{m}$

Where	Total Rainfall amount	:	$766{,}700m^3$
	Mean wadi width	:	15^m
	Length of Wadi-bed	:	20 km

According to local people, the surface water disappeared in half a day; thus the wadi-bed infiltration capacity would be about 5,000mm/day.

(2) Runoff on April 18, 1985

On April 18, 1985, the runoff was observed at the wadi gauge site WM2 (Afi) in upstream of Wadi Al-Ma'awail. The discharge of the flood was estimated as about $41{,}891^{m3}$ based on the recorded water level data. The surface water was inferred to be in the area 1km down from the wadi-

gauge section based on the flood marks. Thus the infiltration capacity of the wadi-bed is estimated as follows.

(The infiltration capacity)

$41{,}891^{m3}$ $(1000^{m} \times 30^{m}) = 1.40^{m}$

Where	Discharge of the flood:	$41{,}891^{m3}$
	Length of the wadi bed	$1{,}000^{m}$
	Mean Wadi-bed width	30^{m}

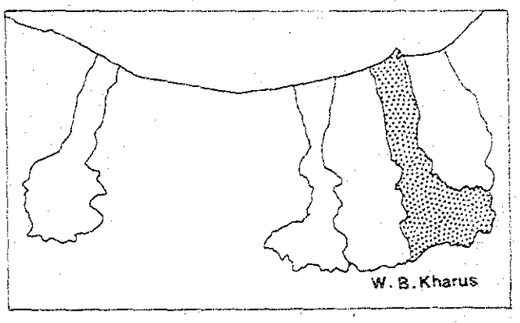
Although the exact duration for the surface water to disappear into the ground is unknown, if the duration was 12 hours, the capacity is about 2800mm/day.

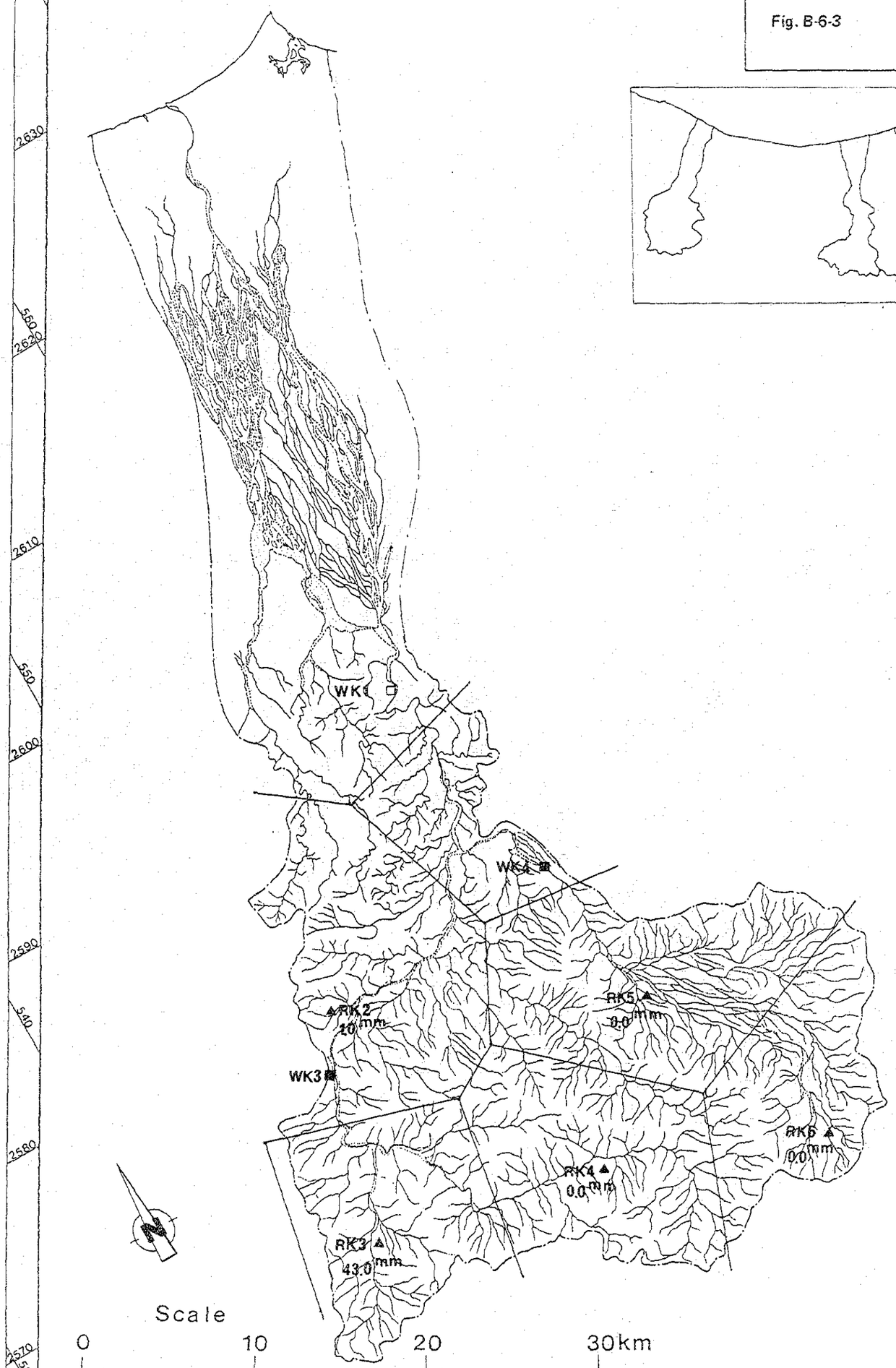
(3) Another study for the wadi-bed infiltration

There is a report which mentions that the capacity of a wadi-bed that is covered with gravel is about 7.2m/day and the capacity of sand-covered wadi-bed is 2.9m/day. This data is the result of an experiment for this capacity in UAE by JICA in Nov. 1981 (Water Resources Development in UAE).

We cannot determine the precise capacity of wadi-bed infiltration capacity, but we can conclude that the wadi-bed does have a great capacity for the infiltration in the study area and in similar areas.

Fig. B-6-3





Rainfall Distribution on Aug. 25, 1984 (Wadi Bani Kharus)