

2

2.1

가 . 6 9 ,
70)
14,33,34,97 99,163,166)
가
77,84,163)
,
76 80) , 14,163)
SPILE(ver.15)
83)
.

2.2

.
가 .
(),
, ,
() ()耐力
. 天變地理
가
가 가
69,70)
가 . ,

2.1 '78 - 87'

62)

	26	82	57	8	4	7	27	8	1	4	224
	2.6	8.2	5.7	0.8	0.4	0.7	2.7	0.8	0.1	0.4	22.4
(%)	11.6	36.6	25.4	3.6	1.8	3.1	12.0	3.6	0.5	1.8	100

1916

1984

2.1 62)

가

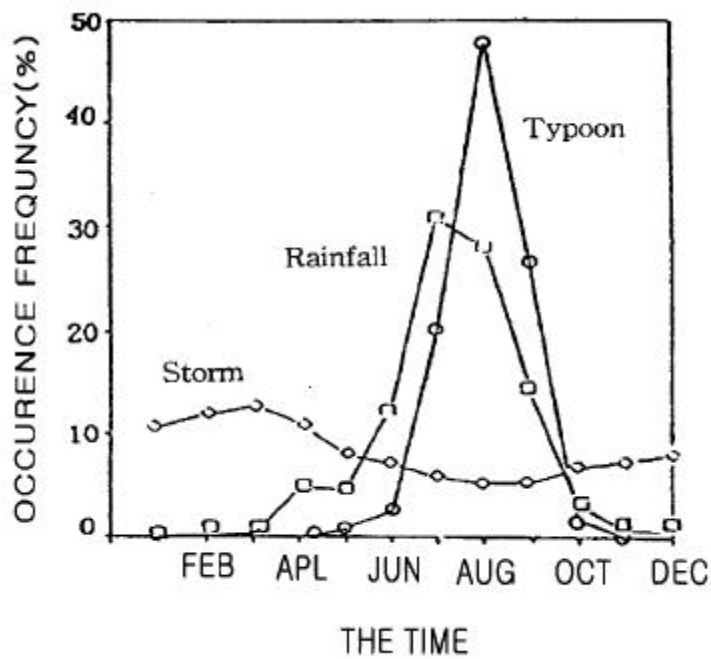
6 9 88.8%가

2/3

가

素

因



， 1916 1990

- 가
- 16)
- ， (水系別)，
- 가
- 70%
- 6 9
- (1) 가 가
- (2) 33 300
- (3) 10 가 가
- .(2.2)
- (4) ， ， ， ， 가
- 70% ， 50%
- (5) 가
- ， ， ，

2.2 10 (1986 1995) 42)

	9	24	1	10	12	9	111	133	83	93	67	180	119	185	18	1,054

2.3

2.3.1

Um and Reedman(1975) Lee(1988)

221,000 km²

70%가

50%

163)

2.2

3



2.2

163)

,

43)

,

,

,

•

50% 100m 2.3(b)
· 가 90%
20m 가 가 2m

90%
가

43)

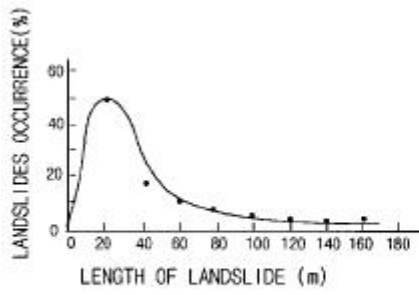
•

1991 7 21 11
100mm/hr)

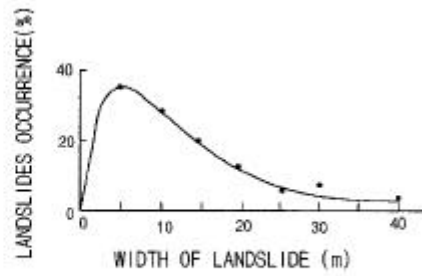
가 1152

.

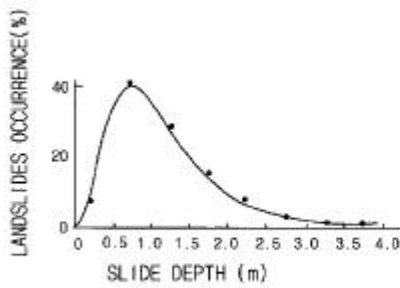
가



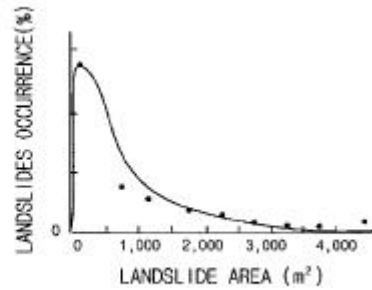
(a)



(b)



(c)



(d)

2.3

(a)

(b)

(c)

(d)

43)

가

가

가

2.4

가

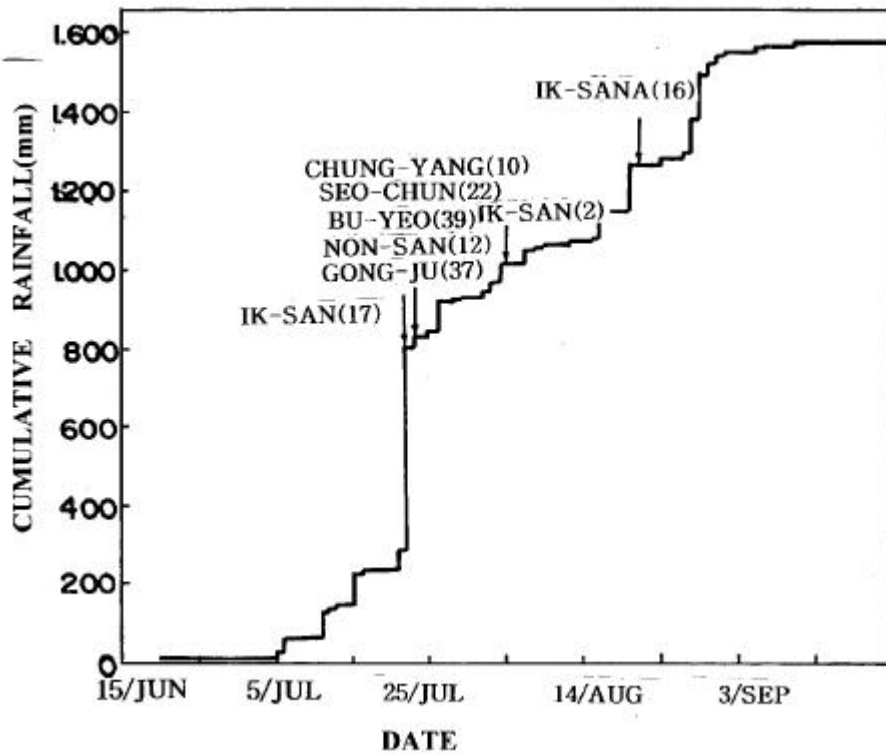
50%

가

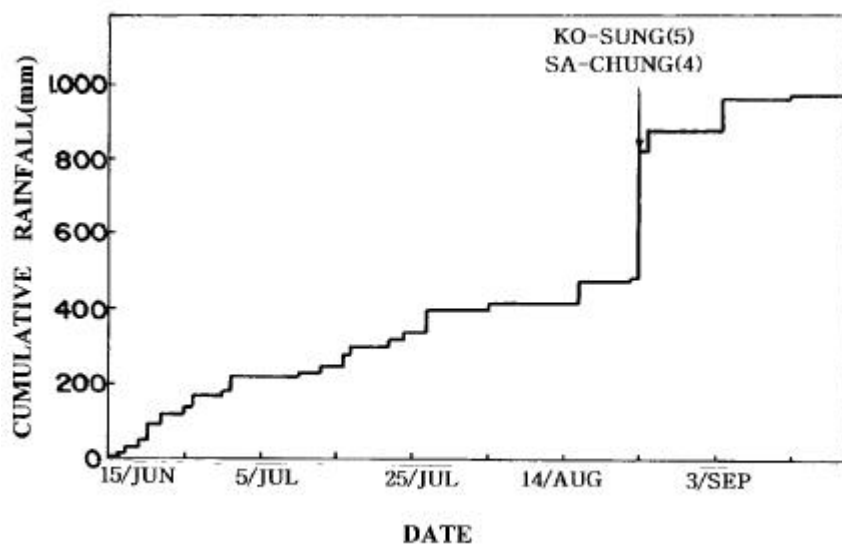
가

2.6

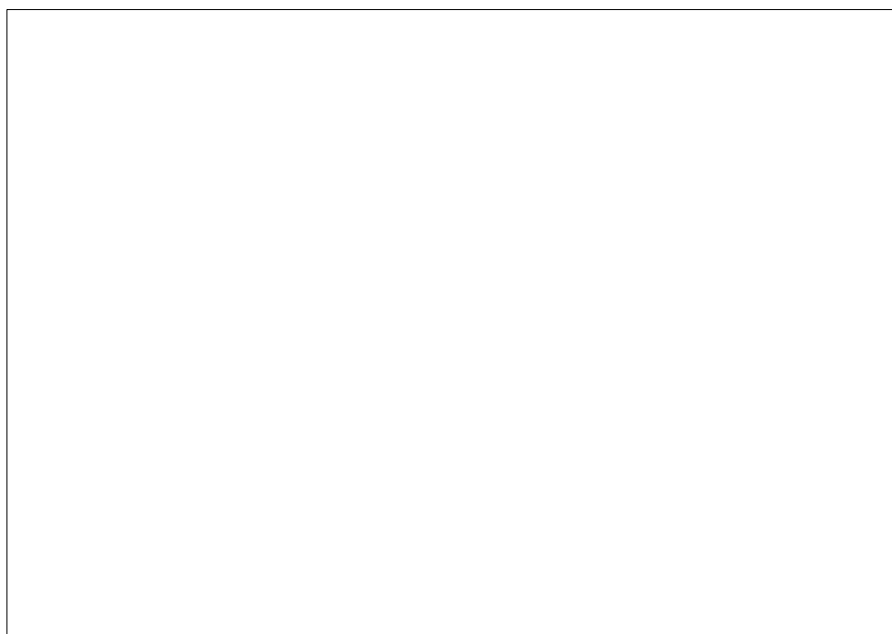
1980 9 10
21 24 , 1 가
9 10 60mm , 3
40mm
3



2.4 1987



2.5 1979



2.6 1980

2.4.2

1977

1987

2.7

2.10

.

.

(2.7), 3 (2.8), 7 (2.9), 15 (2.10) 4 . ,

45 ° ()

45 °

가

45 °

가

가

3

.

2.7

2.8

45.

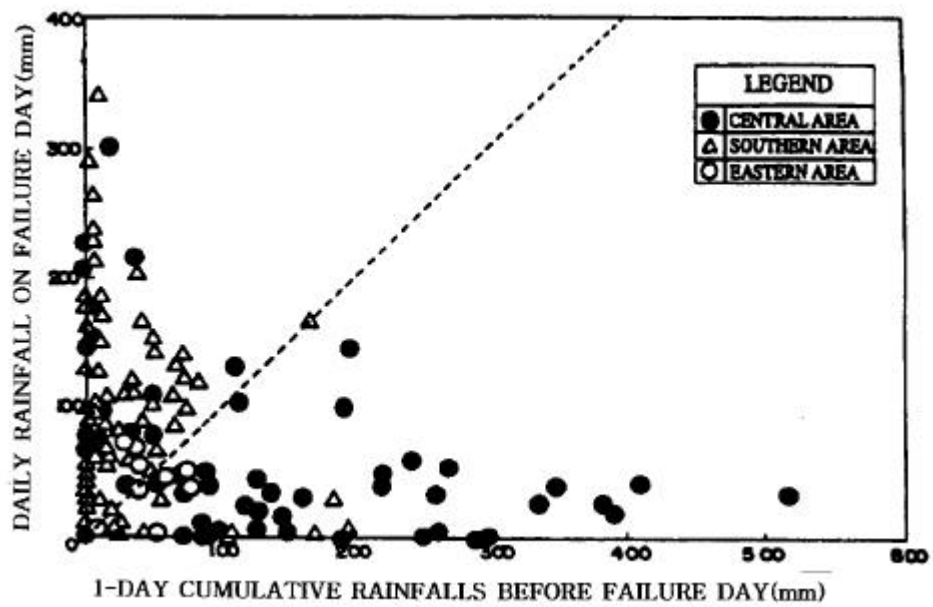
가

2.9

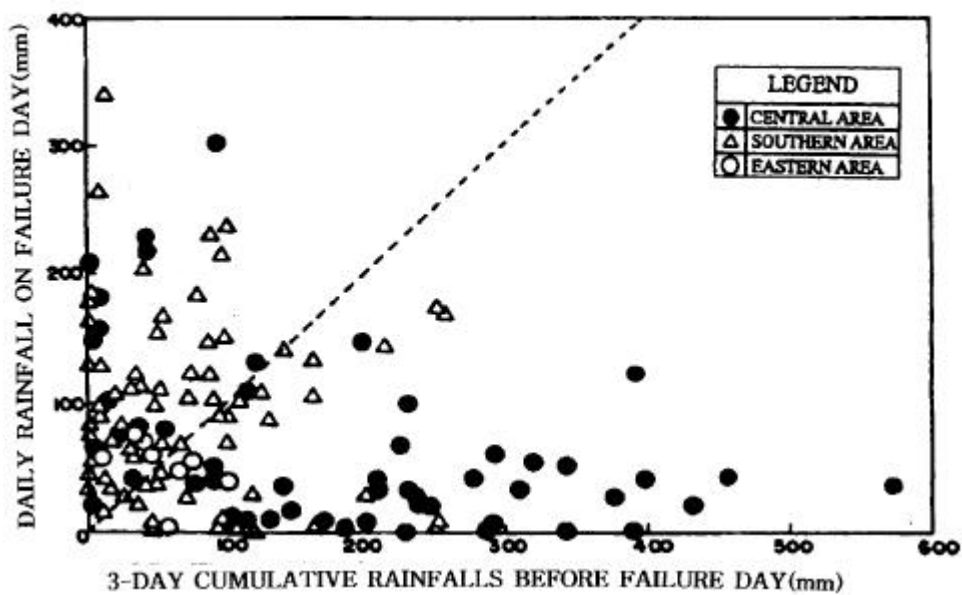
2.10

45.

.

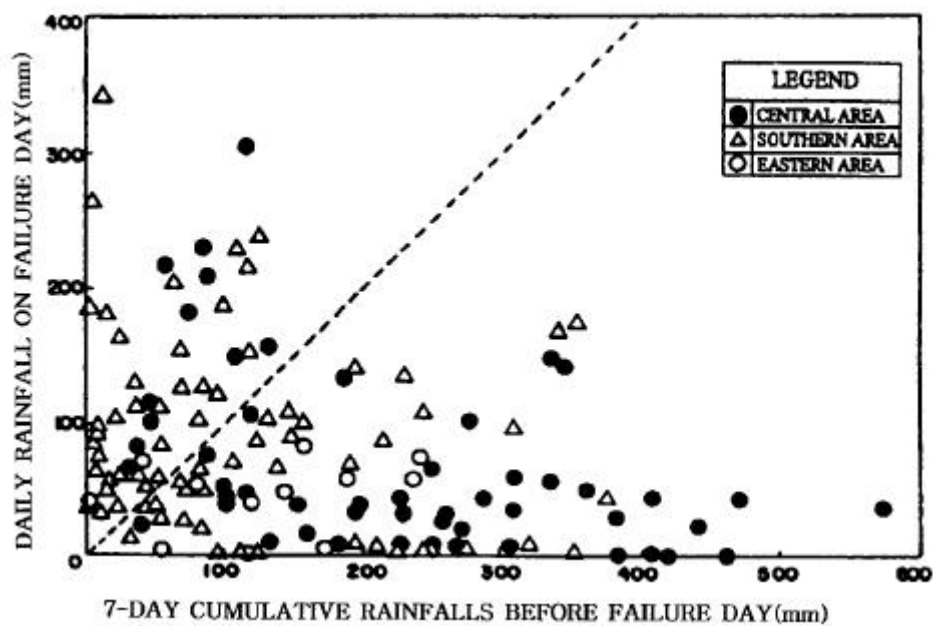


2.7



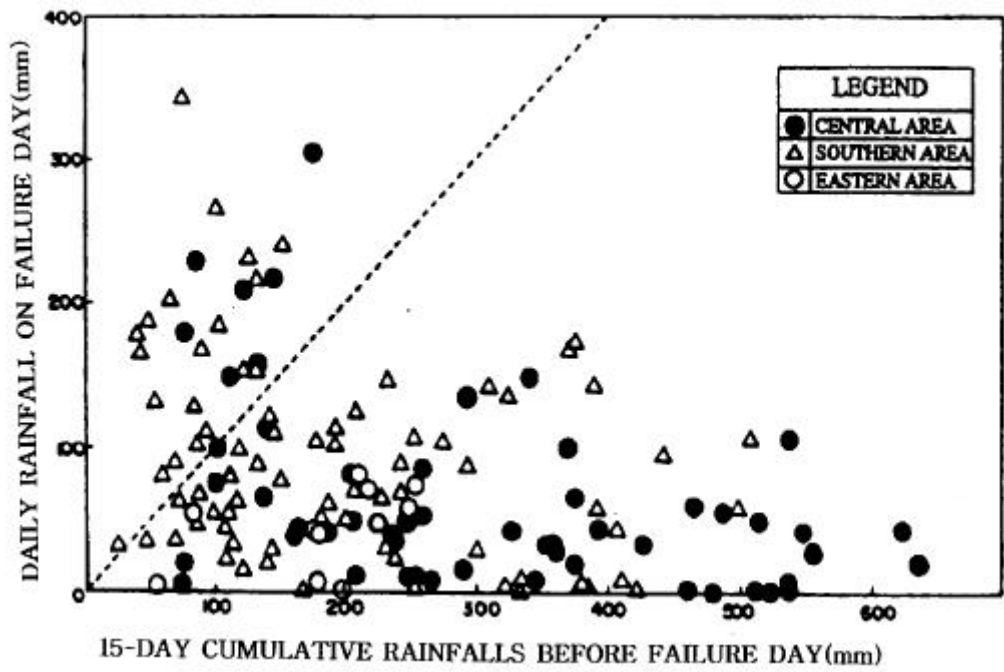
2.8

3



2.9

7



2.10

15

3

7

가

45.

가

가

3

2.7

2.10

2.7

2.8

3

가

가

2.7

2.8

100mm

2.4.3

⁹⁹⁾

가

2.11

2.13

가

(1)

11

1987

2.11(a)

13

37

5

13

4

72

가 7

23

가 53mm,

302mm

2.11(b)

10

10

22

1

43

가

가 36mm,

392mm

(2) .

가 . 2.12(a)

8 25 5 , 5 가 .

340mm

가

50mm 가 2 , 30mm 가 4 , 20mm 가

1 2.12(b)

5 , 4 가 .

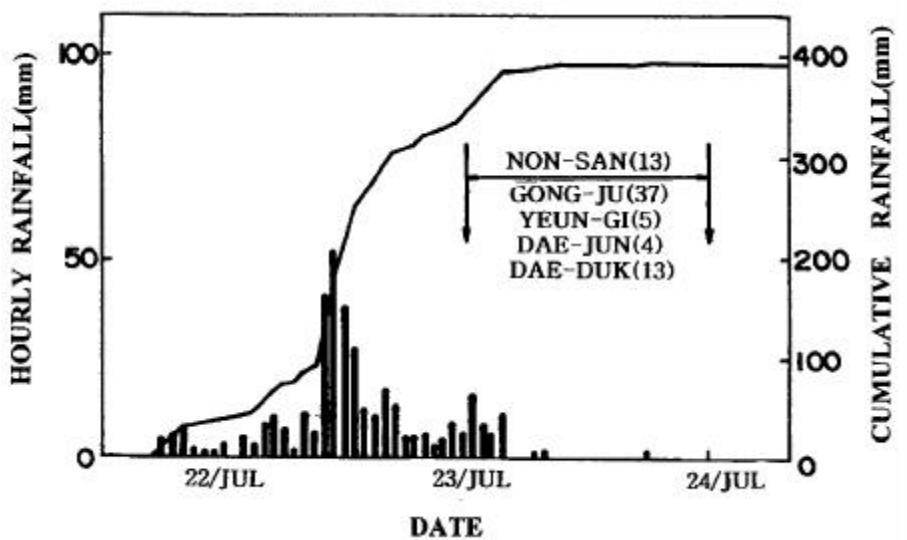
260mm 50mm

가 1 , 40mm 가 1 , 30mm 가 3 , 20mm

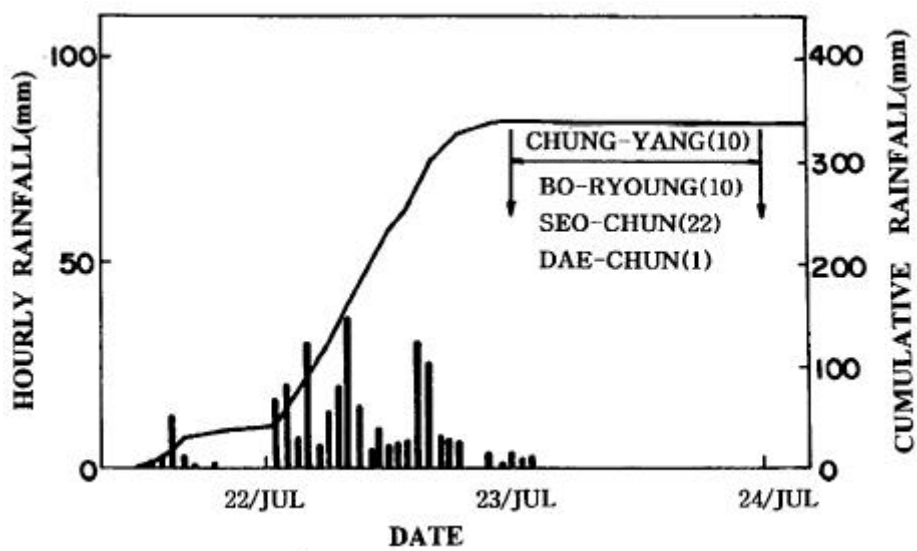
가 1 , 10mm 가 5 .

300mm

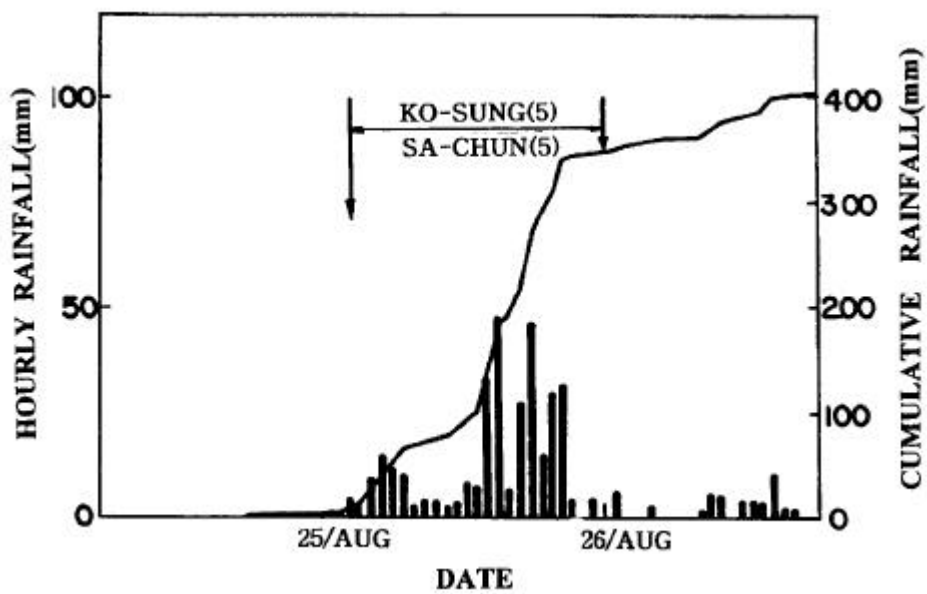
가



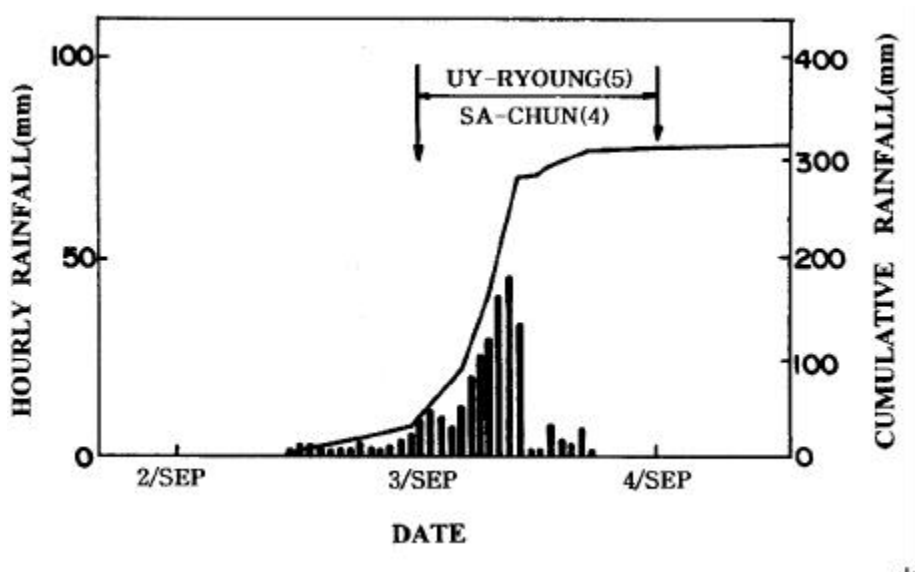
2.11(a) 1987



2.11(b) 1987



2.12(a) 1979



2.12(b) 1979

(3)

2.13

2.13(a)

1977 7 8

7

가

74mm ,

20mm .

1980 9 10

2.13(b)

21 ,

1 ,

24

, 46

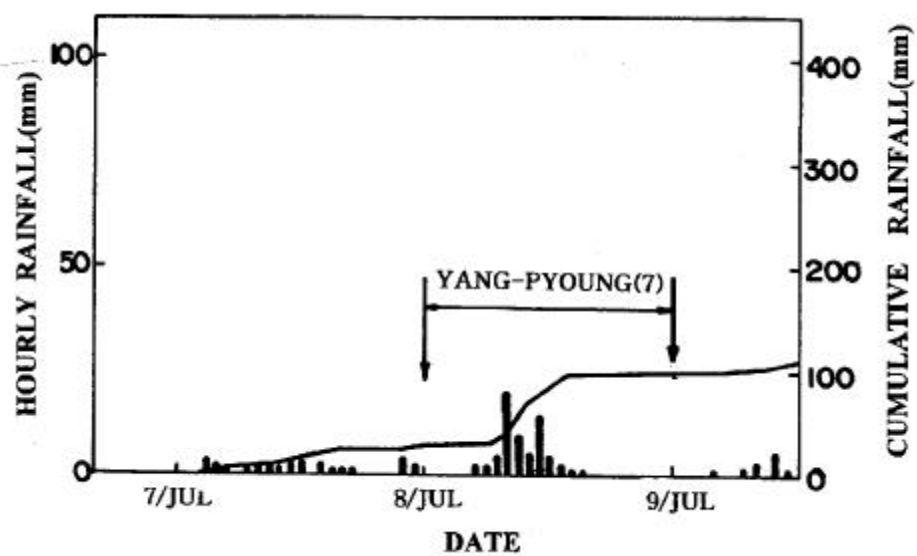
가

66mm

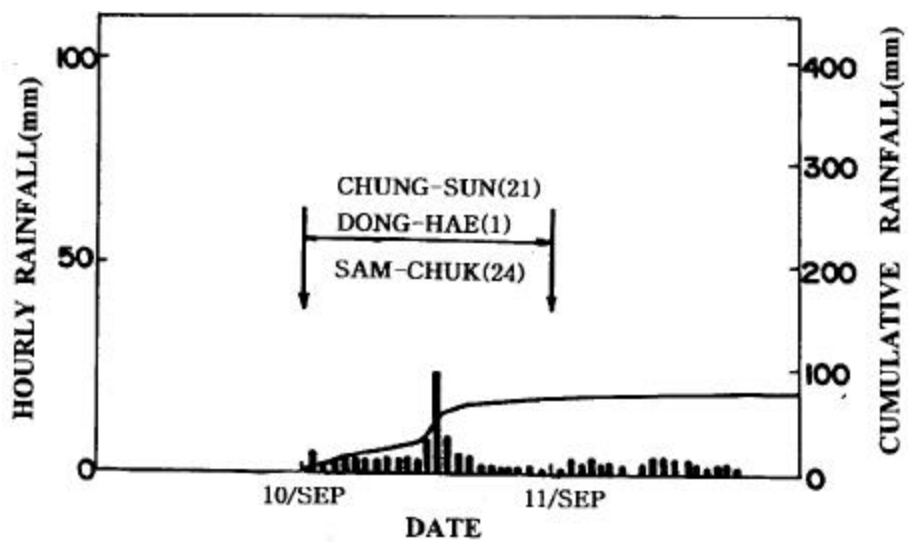
25mm .

가

가



2.13(a) 1977



2.13(b) 1980

2.4.4

(minor), (severe), (disaster)

2.14

가 1 3 , 4

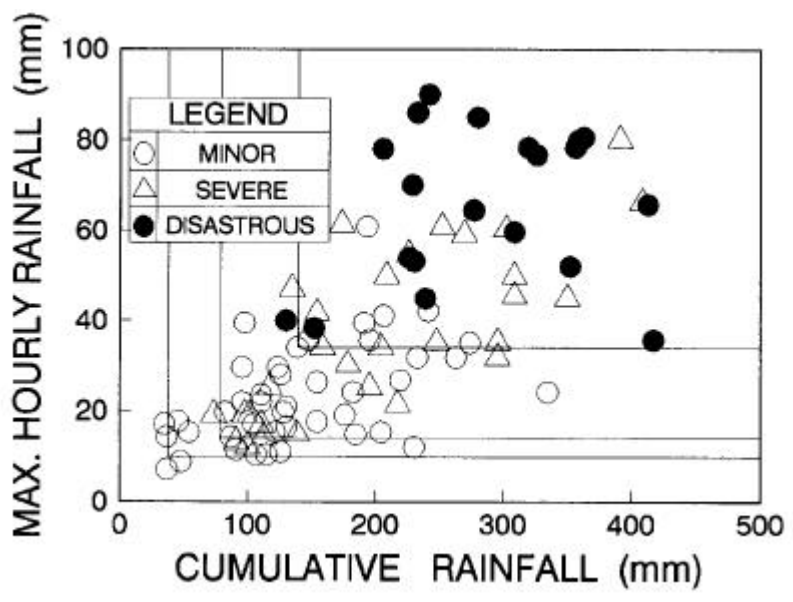
19 , 20

2

가

m km

Lumb



2.14 (,)

가

10mm 40mm

가 15mm 80mm

가 35mm

140mm

(24)

40mm 가 10mm 가

가 , 80mm 가

15mm가 가 가

, 140mm 가 40mm

1991

2.5

2.5.1

, , 가 .

70%가 6 9

10 (1982 1991)

2.2 .

7,8 ,

1985 1 , 1987 7 , 1991 9 ^{34,77)}

, 2.4 가

1977 1992

1 , 3 7 2.15(a) 2.1

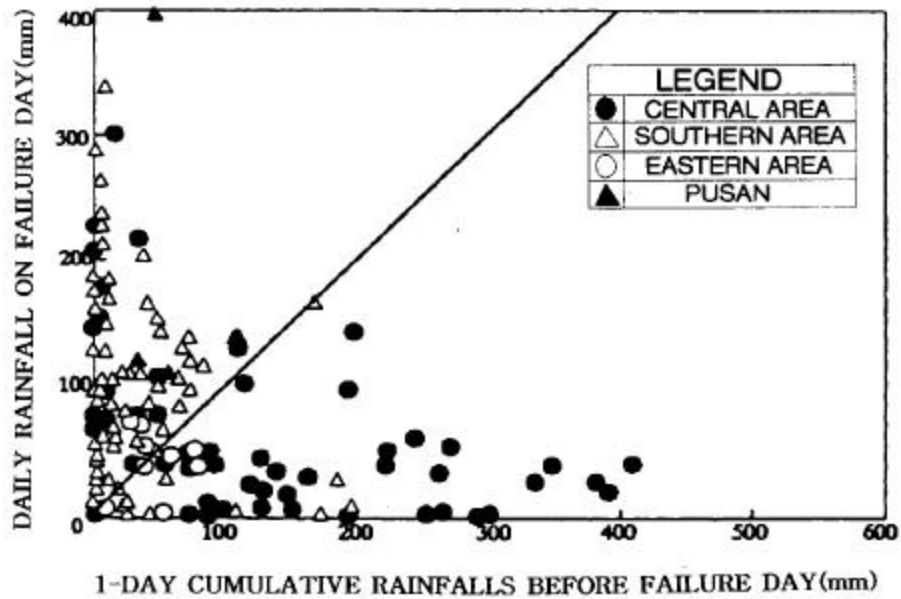
5(c) .

2.2

10

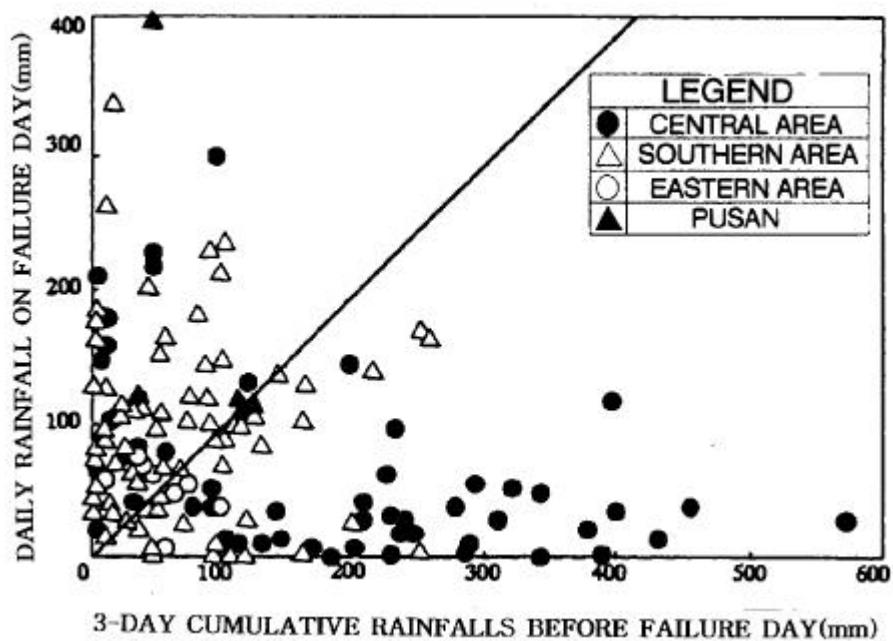
(1982- 1991)^{34,77)}

	6	7	8	9	
1- 7		1			1
8- 14					
15- 21					
22- 28			9		9
29- 31		7	6		13
		8	15		23
(%)		35	65		100



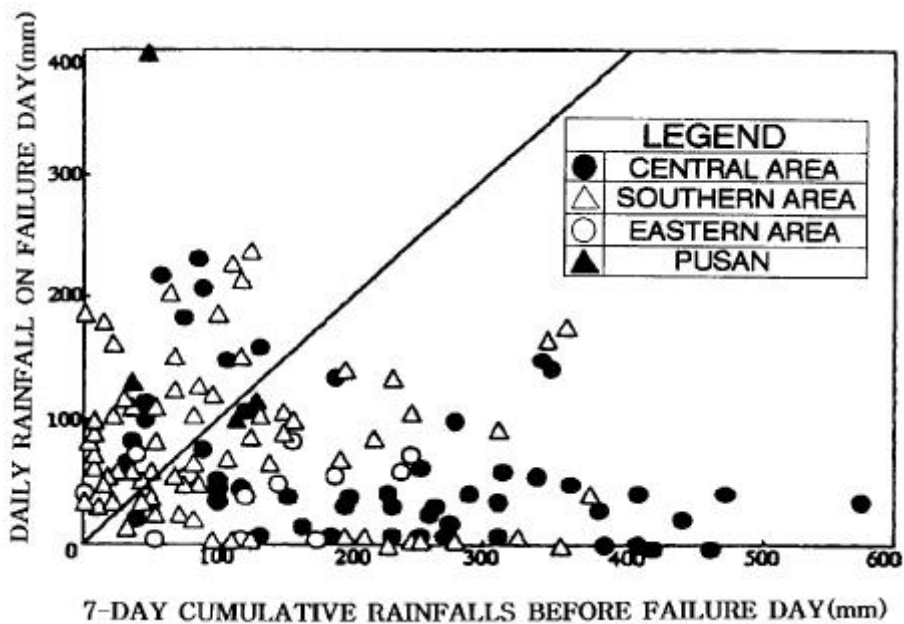
2.15(a)

1



2.15(b)

3



2.15(c)

7

2.16

가

2.17

2.17

10

2.14

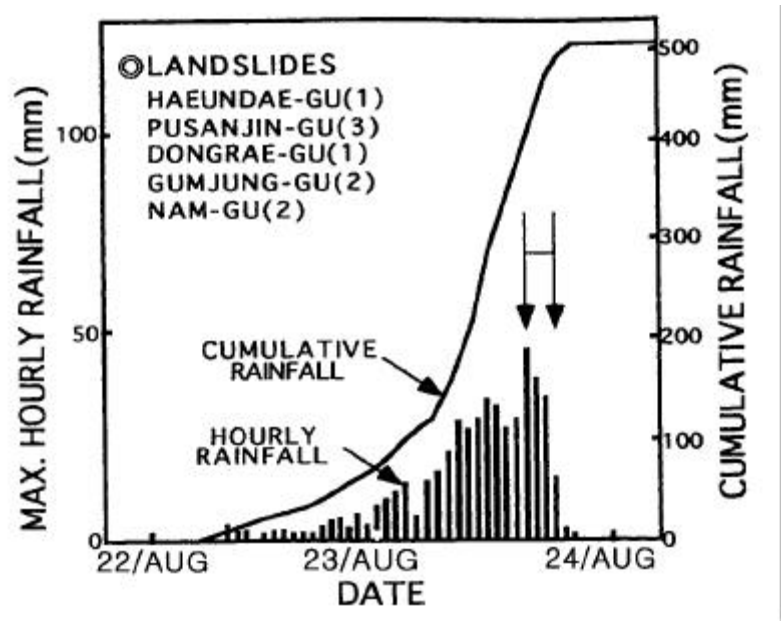
10 (2.2) 가

85

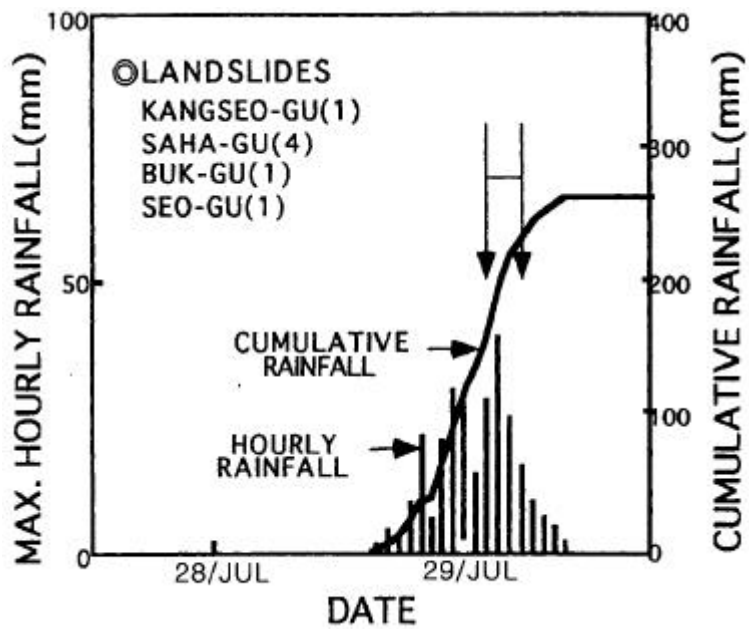
87 , 89 , 91

가 80%

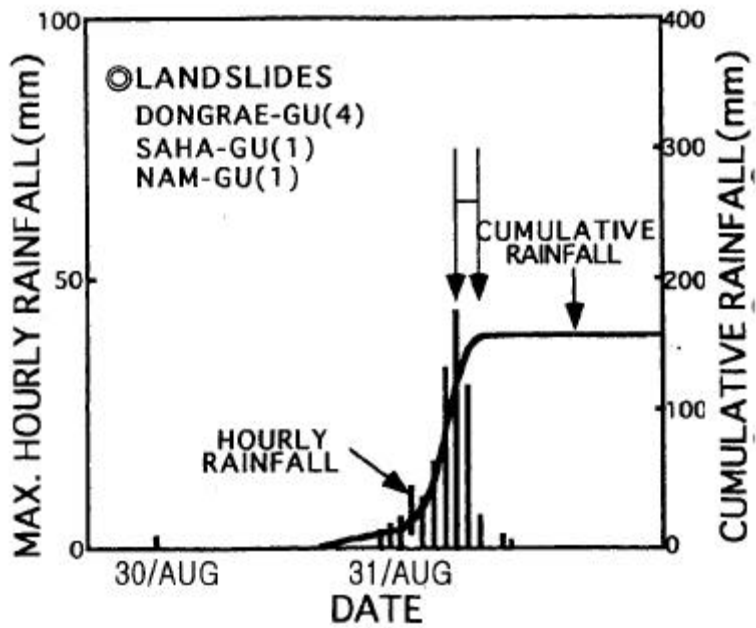
가 50%, 가 30%



2.16(a) 1991



2.16(b) 1989



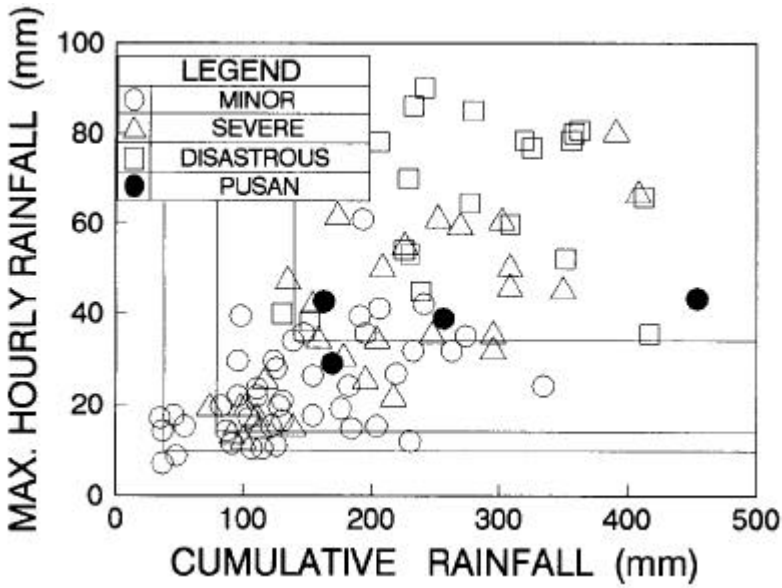
2.16(c) 1987

2.5.2

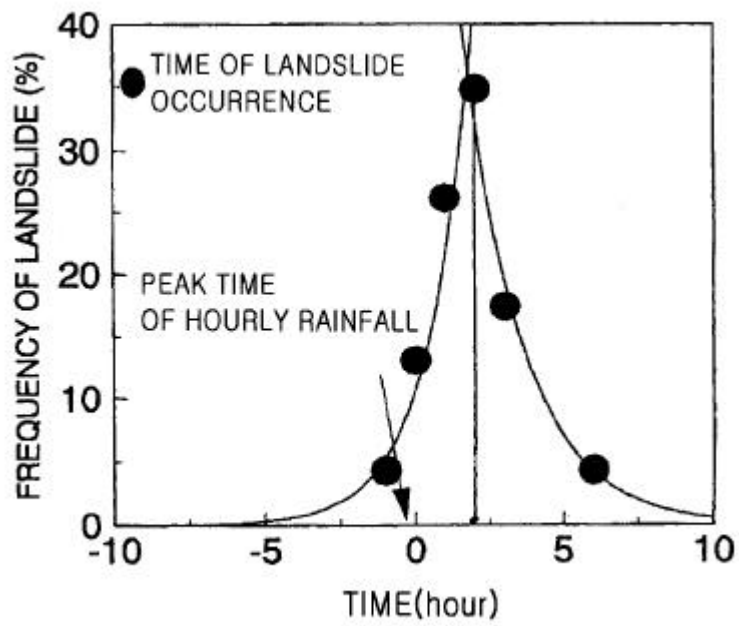
2.17
18.4mm, 79.7mm
42.8mm
153.2mm 가
23mm 110mm

2.5.3

2.18
1.8 36.7%



2.17 10 (+)



4.1.3

3

90%

3 가

2.6

2.6.1

가

가 . ,

가

가

가

124)

Lumb

(2.1) ¹⁶⁶⁾

, , , (S_f - S_i)

$$h = \frac{K_s t}{n(S_f - S_i)} \tag{2.1}$$

h , K_s , n , S_f, S_i

t

, 가 가

가 . ,

가

가

¹⁰⁷⁾

G.C.O 10

2.19 ¹²⁸⁾ ,

50%가 40% 10

K_s

(S_f - S_i)

가 가 가 .

Weyman

가

가

가

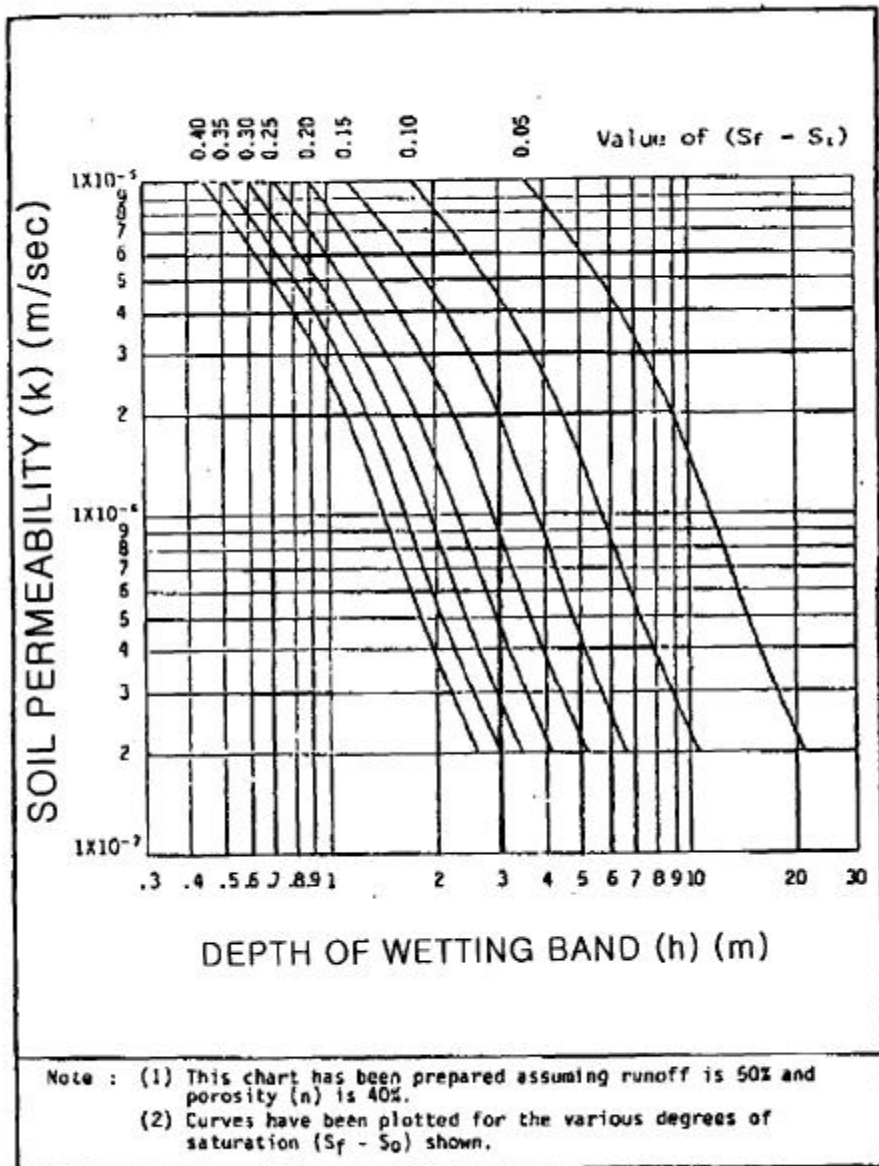
²³¹⁾

Niver and Walter

$$K_s = 4 \times 10^{-3} cm / sec$$

$$r = 2.83 \times 10^{-4} cm / sec$$

²⁰²⁾



2.19 10

128)

2.6.2

(1)

가 1993 8 19

2.20

61,76 78,147 148)

SPILE (Ver 1.0)

16.5M

1.5m

H - 300x300x 10x 15 H

1.5m

H - 250x250x9x 14 2m 4

가 1:1

12.5m 5

5

(2)

2.21

가

AA 2.22

가 가

가 가

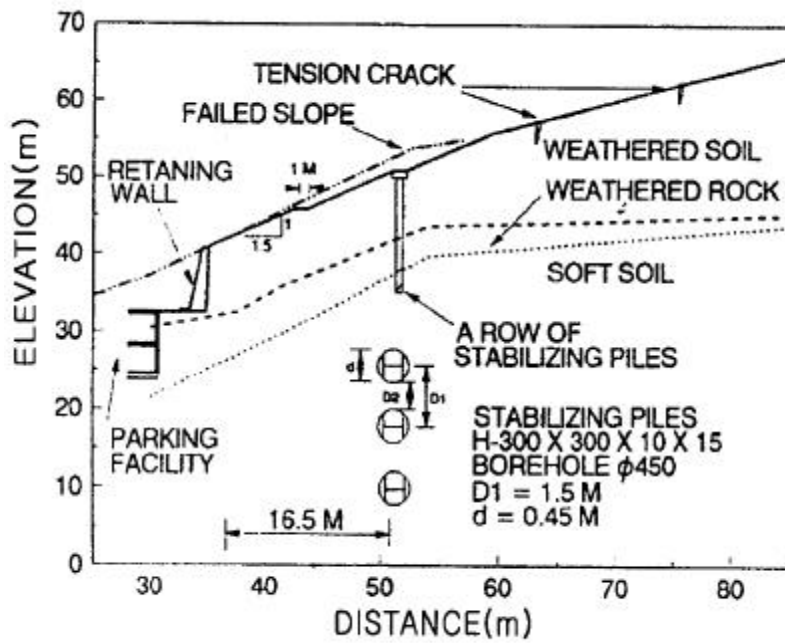
가 가

가 가

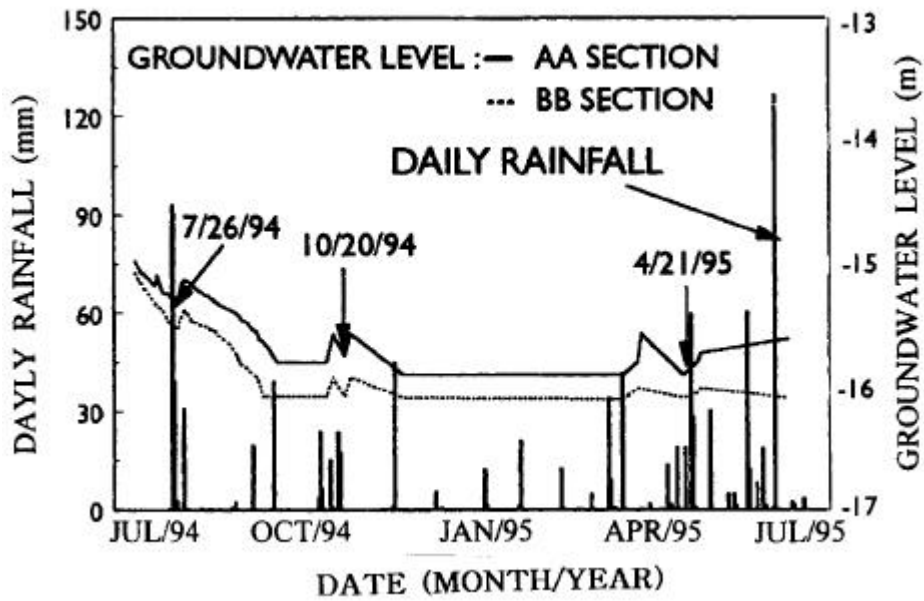
가

(wetting front) Suction

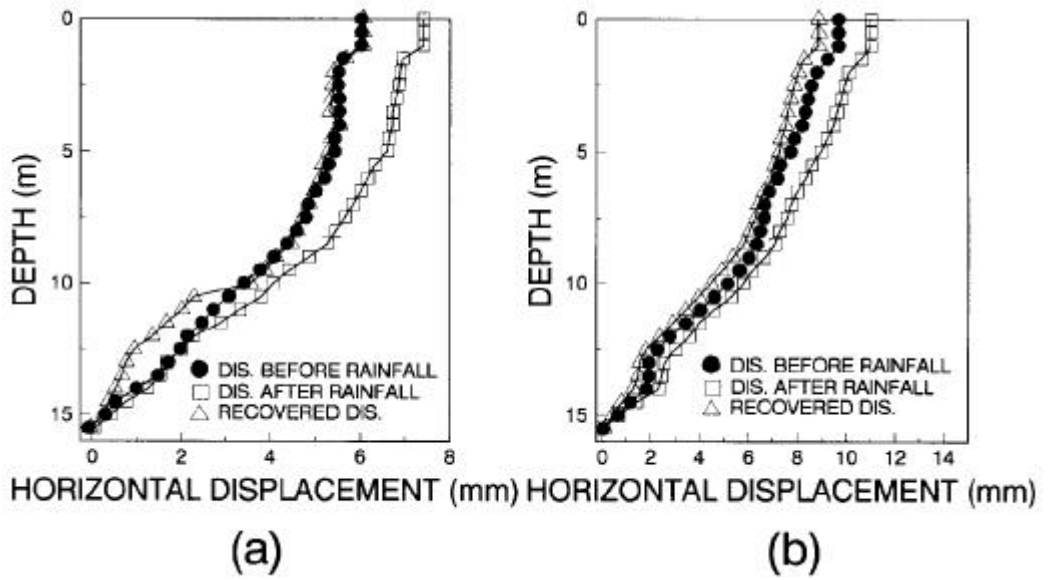
가



2.20



2.21



2.22

(3)

가 6.7×10^{-4}

cm/ sec, 6.3×10^{-5} cm/ sec

0.24- 20

가 1k- 30k ,

14,163)

가 가 .

가 가 가 가 가

가 가 가 가 5 가

가 가 가 가 가

가 가 가 가 가

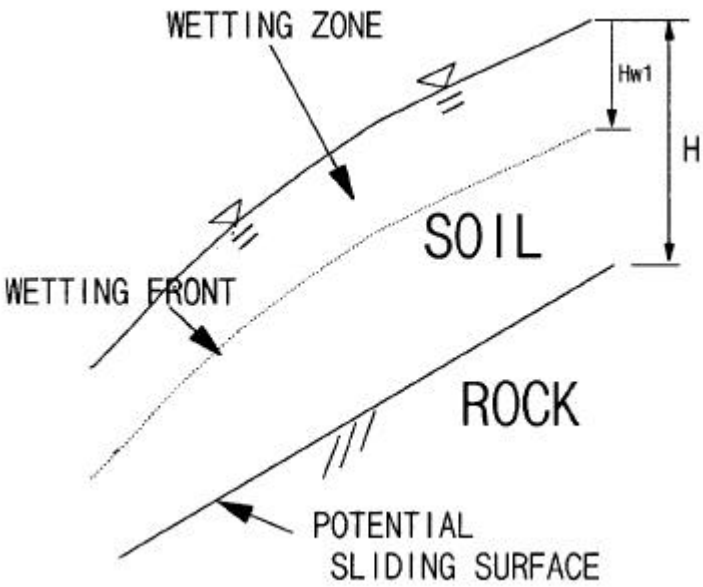
가 가 가 가 가

2.6.3

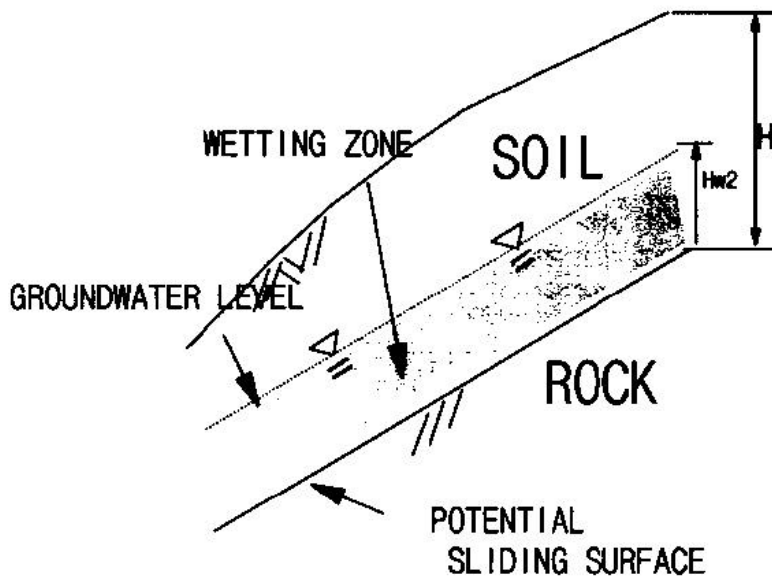
2.25

83)

(1) 2.23 가 (Potential sliding surface) H H_{w1} 가 , $H_{w1}/H = 0.3$ 가 30% 30% 가



2.23 가



2.24

가

(2)

2.24

가 (Potential sliding surface) H

가 H_{w2}

가

가 가

가

가

가 $H_{w2}/H = 0.3$ 가 30%

가 30% 가

2.6.4

(1)

2.25 가 .

13- 30m

$\gamma_t = 1.85 t / m^3$, $\phi = 25^\circ$,

$c = 1.0 t / m^2$.

가 .

$\gamma_t = 2.0 t / m^3$, $\phi = 40^\circ$, $c = 2.0 t / m^2$

.

(2)

$H_{w1} / H = 0.0, 0.1, 0.2 \quad 0.9, 1.0$

가 $H_{w2} / H = 0.0, 0.1,$

$0.9, 1.0$ 가

2.26 .

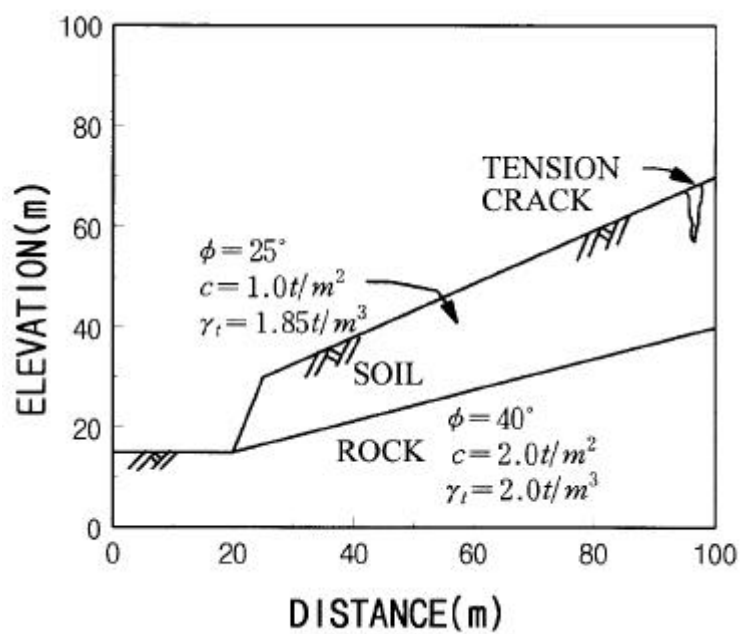
.

$H_{w1} / H = 0.45$ $H_{w2} / H = 0.72$

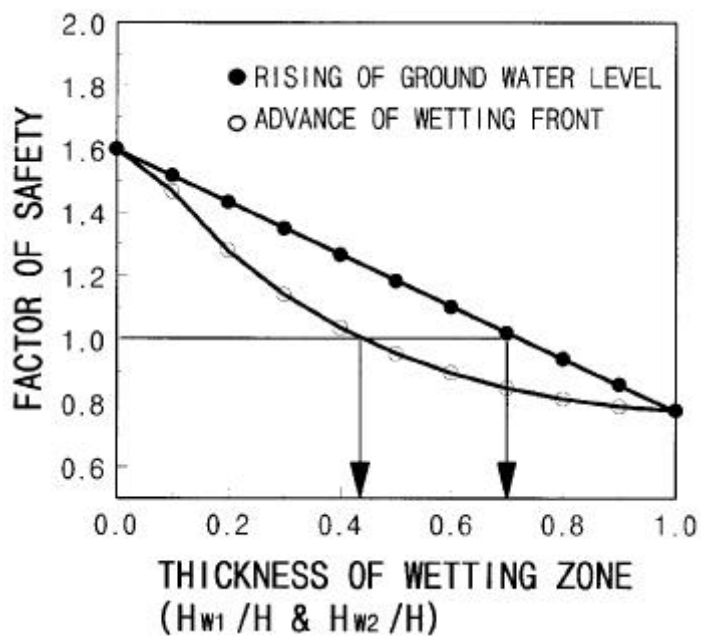
가

.

.



2.25 ()



2.26

(3)

가 ,
 가
 2.27 .

(1)

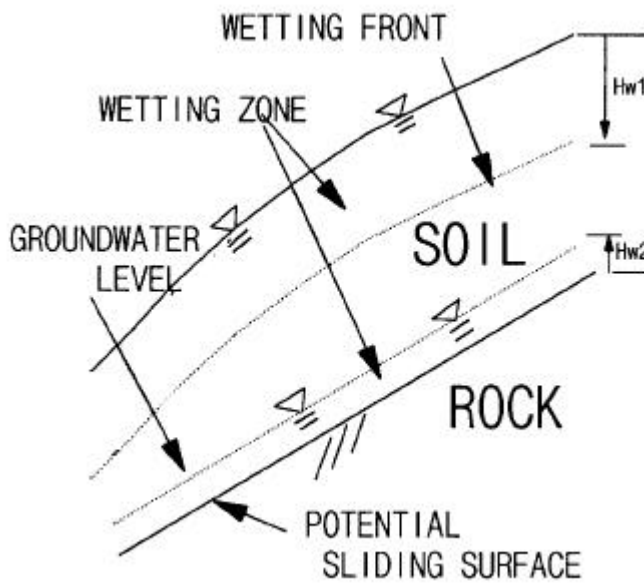
(2.27(a))

(2)

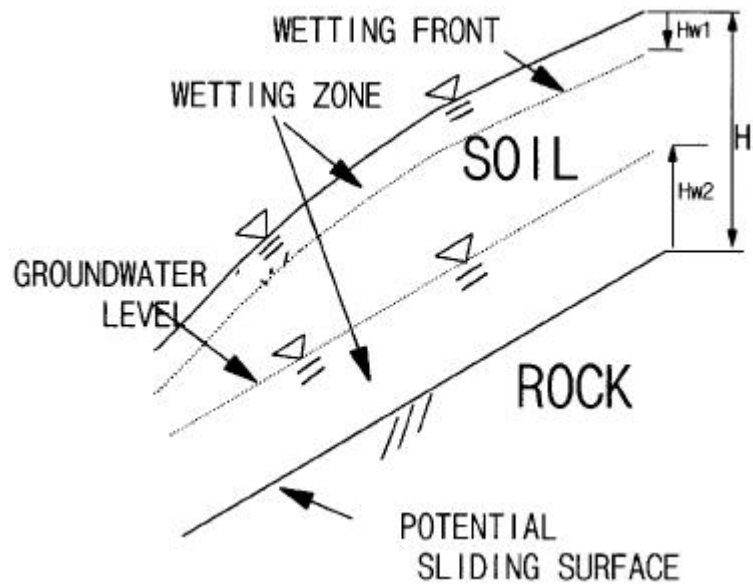
(2.27(b))

가
 가

2.30 , H_{w1}/H
 H_{w2}/H .



2.27 (a)



2.27 (b)

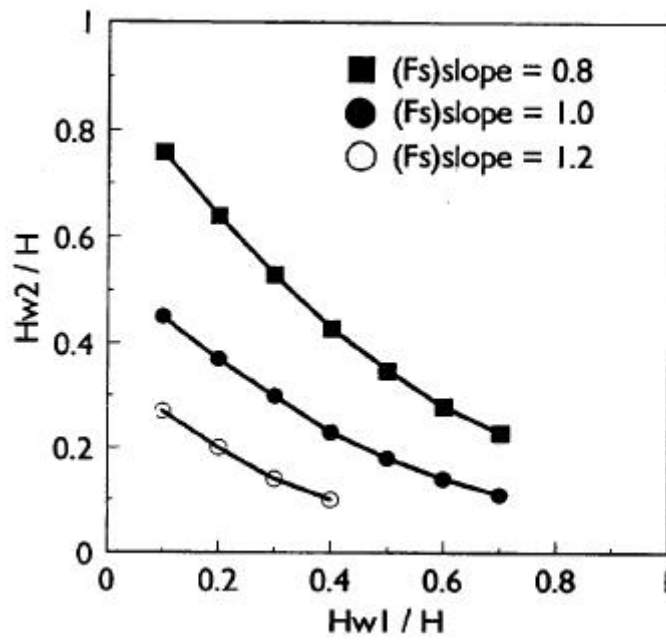
$$H_{w1}/H = 0.1$$

$$H_{w2}/H = 0.45, \quad H_{w1}/H = 0.2, \quad H_{w2}/H = 0.36$$

가

$$H_{w2}/H = 0.5$$

2.6.5



2.28

(1)

2.29

2

40%

2.30

가

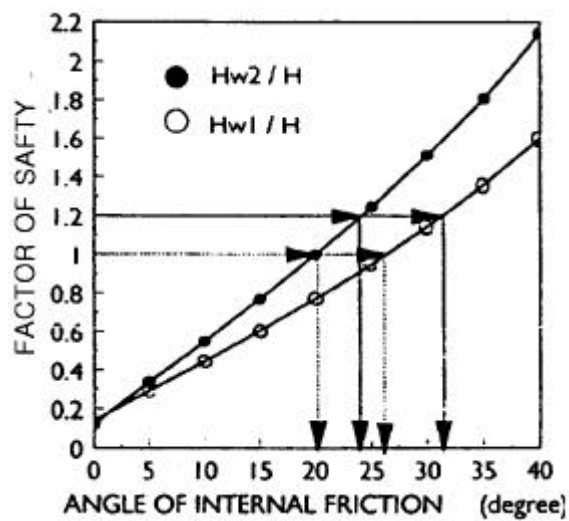
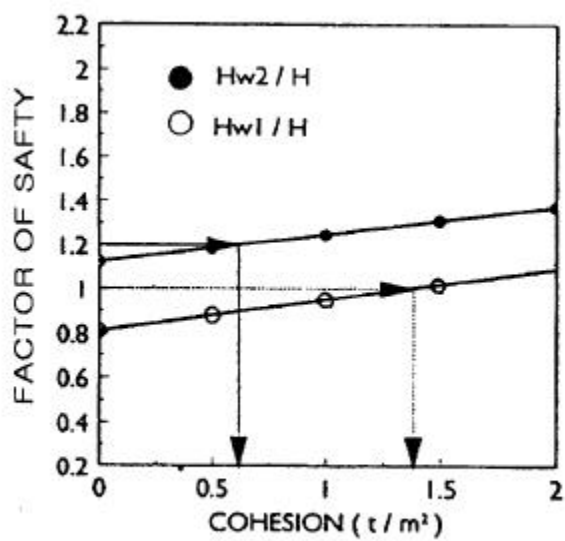
가

가

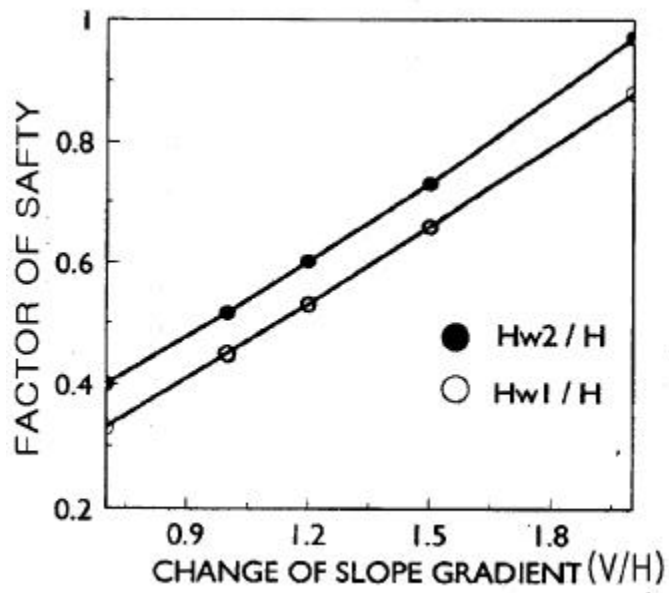
가

$\phi = 31.5^\circ$

$\phi = 26.5^\circ$



2.30



2.32

2.7

1)

2)

2

10mm

2

40mm

- 140mm 2 80mm 15mm 35mm 2 .
- 3) 1) 2) .
- 90% 가 3 .
- 4) , 가 가 ,
 . 가
- 가 Suction .
- 5) SPILE Ver. 1.5 .