TABLE-I.14 RECORDED ANNUAL RAINFALL

| Year \ Station | Bacacay | Guinabatan | Legaspi | Libon | Allang | Malama | Polangui | Sto. Domingo | Tabaco | Malinao |
|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | | 3,543 | 4,091 | | | | | 5,115 | | |
| 1957 | | 2,381 | 2,810 | | | | | 3,008 | | |
| 1958 | | 2,763 | 3,535 | | | | | 4,113 | | |
| 1959 | | 3,053 | 3,337 | | | | | 3,583 | | |
| 1960 | | - | (* 3,040) | | | | | 3,280 | | |
| 1961 | | 1,934 | 2,454 | | | | | 2,580 | | |
| 1962 | | 2,548 | 3,229 | | | | | 2,990 | | |
| 1963 | | 2,134 | 2,588 | | | | | 3,212 | | |
| 1964 | | 2,227 | 3,512 | | | | | 4,018 | | |
| 1965 | | 1,092 | 3,711 | | | | | 3,898 | | |
| 1966 | | 2,587 | 3,892 | | | | | 3,664 | | |
| 1967 | | 2,220 | 3,094 | | | | | 3,242 | | |
| 1968 | | (* 2,015) | 2,073 | | | | | 2,140 | | |
| 1969 | | (* 1,628) | 2,319 | | | | | 2,383 | | |
| 1970 | | 2,977 | 4,179 | | | | | 4,068 | | |
| 1971 | | (* 2,992) | 4,231 | | | (* 1,417) | | 4,754 | - | |
| 1972 | 2,108 | 2,560 | 3,511 | 1,957 | | 2,373 | | 3,666 | * 3,312 | 4,070 |
| 1973 | 2,071 | 3,068 | 3,835 | 2,180 | | 2,080 | | 4,026 | * 4,455 | 4,257 |
| 1974 | * 2,628 | (* 2,233) | 3,760 | (* 1,482) | | (* 1,149) | | 3,128 | 2,931 | 4,040 |
| 1975 | * 2,899 | 2,974 | 4,220 | 2,623 | (* 1,739) | - | | 3,917 | 3,833 | 4,714 |
| 1976 | * 2,736 | 3,244 | 3,277 | 2,265 | (* 971) | (* 775) | (* 654) | 4,431 | (* 6,380) | 5,128 |
| 1977 | * 2,296 | 1,901 | 3,058 | (* 1,064) | 2,704 | (* 1,870) | 977 | 3,612 | - | (* 3,858) |
| 1978 | 2,354 | 2,052 | (* 3,171) | - | 1,997 | 2,123 | 1,362 | 3,430 | - | 4,041 |
| 1979 | (* 1,489) | 2,218 | 2,810 | - | 4,723 | (* 1,919) | (* 796) | 2,962 | - | 3,164 |
| Number of Years | 8 | 23 | 24 | 6 | 5 | 8 | 4 | 24 | 5 | 8 |
| Average | 2,442 | 2,499 | 3,342 | 2,256 | 3,141 | 2,192 | 1,170 | 3,551 | 3,633 | 4,203 |

Note: * No record month exists

- No record

TABLE-I.15 RECORDED ANNUAL MINIMUM MONTHLY RAINFALL

(1) LEGASPI

| Year | Month | Amount (mm) | Remarks (No record period) |
|---|---|---|---|
| 1956 | June | 87.0 | |
| 1957 | Feb. | 98.8 | |
| 1958 | Apr. | 75.2 | |
| 1959 | June | 72.7 | |
| 1960 | July | 193.0 | JAN. - MAR. |
| 1961 | Feb. | 46.5 | |
| 1962 | Apr. | 91.8 | |
| 1963 | Apr. | 41.9 | |
| 1964 | Mar. | 96.6 | |
| 1965 | Apr. | 158.4 | |
| 1966 | Apr. | 87.8 | |
| 1967 | May | 47.2 | |
| 1968 | May | 19.4 | |
| 1969 | Feb. | 24.1 | |
| 1970 | May | 134.5 | |
| 1971 | Apr. | 137.9 | |
| 1972 | Apr. | 95.8 | |
| 1973 | Mar. | 83.0 | |
| 1974 | Apr. | 65.6 | |
| 1975 | Mar. | 122.0 | |
| 1976 | Apr. | 104.9 | |
| 1977 | June | 107.3 | |
| 1978 | Feb. | 92.8 | JAN. |
| 1979 | Mar. | 73.1 | |

(2) GUINOBATAN

| Year | Month | Amount (mm) | Remarks (No record period) |
|---|---|---|---|
| 1956 | Jan. | 100.5 | |
| 1957 | May | 26.8 | |
| 1958 | Apr. | 21.1 | |
| 1959 | Apr. | 35.1 | |
| 1960 | - | - | JAN. - DEC. |
| 1961 | Feb. | 1.0 | |
| 1962 | Apr. | 39.8 | |
| 1963 | Mar. | 11.4 | |
| 1964 | May | 50.7 | |
| 1965 | Mar. | 22.6 | |
| 1966 | Apr. | 30.4 | |
| 1967 | May | 46.6 | |
| 1968 | Apr. | 10.4 | MAY.-AUG.,NOV. |
| 1969 | Mar. | 7.6 | JAN. JUNE |
| 1970 | May | 43.6 | |
| 1971 | Apr. | 73.5 | FEB. |
| 1972 | Apr. | 22.5 | |
| 1973 | Apr. | 11.2 | |
| 1974 | Mar. | 39.0 | SEPT. |
| 1975 | Mar. | 8.2 | |
| 1976 | Apr. | 13.6 | |
| 1977 | Oct. | 8.6 | |
| 1978 | Feb. | 12.0 | |
| 1979 | Mar. | 11.4 | |

(3) MALINAO

| Year | Month | Amount (mm) | Remarks (No record period) |
|---|---|---|---|
| 1972 | May | 101.3 | |
| 1973 | Mar. | 96.3 | NOV |
| 1974 | Aug. | 137.1 | |
| 1975 | Feb. | 29.5 | |
| 1976 | Sept. | 180.0 | |
| 1977 | June | 179.7 | APR. |
| 1978 | Jan. | 139.2 | |
| 1979 | Mar. | 34.0 | |

TABLE-I.16 RECORDED ANNUAL MINIMUM MONTHLY MEAN RUNOFF

(1) San Francisco River
Bobongsuran (131 $km^2$)

| Year | Mean Runoff | Remarks (No record period) |
|---|---|---|
| 1956 | 4.5 | JAN. - APR.22 |
| 1957 | 3.3 | |
| 1958 | 1.5 | |
| 1959 | 0.9 | |
| 1960 | 4.1 | |
| 1961 | 3.9 | |
| 1962 | 3.7 | |
| 1963 | 2.5 | |
| 1964 | 2.7 | |
| 1965 | 3.3 | |
| 1966 | 3.0 | |
| 1967 | 3.3 | |
| 1968 | 1.3 | |
| 1969 | 2.7 | |
| 1970 | 1.6 | JAN. - MAR., JUNE - SEPT., DEC. |
| 1971 | 1.5 | AUG. |
| 1972 | 6.0 | NOV. |
| 1973 | 4.1 | AUG. - DEC. |
| 1974 | 4.3 | JAN., JUNE |
| 1975 | 3.3 | JAN., FEB., APR., SEPT., OCT. |
| 1976 | 2.2 | SEPT. |
| 1977 | 3.6 | |
| 1978 | 4.0 | JUL. - SEPT. |

(2) Cabilogan River,
Bobongsuran (164 $km^2$)

| Year | Mean Runoff | Remarks (No record period) |
|---|---|---|
| 1956 | 7.6 | JAN. - APR.22 |
| 1957 | 7.5 | |
| 1958 | 5.3 | |
| 1959 | 4.6 | |
| 1960 | 9.0 | |
| 1961 | 7.4 | |
| 1962 | 5.6 | |
| 1963 | 5.5 | |
| 1964 | 5.6 | |
| 1965 | 5.3 | |
| 1966 | 7.2 | |
| 1967 | 5.9 | NOV. - DEC. |
| 1968 | 2.3 | JAN. - MAY AUG. - OCT. |
| 1969 | 2.5 | OCT. - NOV. |
| 1970 | 1.8 | APR., MAY, JUL., SEPT., NOV., OCT. |
| 1971 | 3.0 | JAN., JUNE, AUG. |
| 1972 | 6.5 | JUL., SEPT., OCT., DEC. |
| 1973 | 5.9 | JAN. |
| 1974 | 11.0 | |
| 1975 | 3.1 | JAN., FEB., APR. |
| 1976 | 2.8 | SEPT. |
| 1977 | 3.3 | |
| 1978 | 4.1 | |

(3) Irraya River,
Obaliw (217 $km^2$)

| Year | Mean Runoff | Remarks (No record period) |
|---|---|---|
| 1960 | 3.5 | |
| 1961 | 7.4 | |
| 1962 | 3.8 | |
| 1963 | 3.7 | |
| 1964 | 3.8 | |
| 1965 | 2.6 | |
| 1966 | 3.5 | |
| 1967 | - | JAN. - DEC. |
| 1968 | - | JAN. - DEC. |
| 1969 | - | JAN. - DEC. |
| 1970 | 2.9 | AUG. - SEPT. |
| 1971 | 2.1 | |
| 1972 | 3.2 | |
| 1973 | 3.2 | SEPT. |
| 1974 | 3.9 | NOV. |
| 1975 | 3.1 | MAR. |
| 1976 | 4.5 | JAN. |
| 1977 | 3.3 | FEB. - MAR. |

TABLE-I.17 RECORDED ANNUAL MINIMUM MONTHLY MEAN RUNOFF

(1) Ogsong River, Benanuan (11 $km^2$)

| Year | Mean Runoff | Remarks (No record period) |
|---|---|---|
| 1954 | 1.12 | JAN. - MAR.11 |
| 1955 | 1.23 | |
| 1956 | 0.82 | |
| 1957 | 1.49 | |
| 1958 | - | JAN. - DEC. |
| 1959 | - | JAN. - DEC. |
| 1960 | 0.45 | JAN.14 - FEB.4<br>MAR.8 - MAY 31 |
| 1961 | 0.41 | |
| 1962 | 0.21 | |
| 1963 | 0.03 | |
| 1964 | 0.06 | APR. |
| 1965 | 0.07 | |
| 1966 | 0.05 | |
| 1967 | 0.03 | MAR. |
| 1968 | 0.05 | |
| 1969 | 0.01 | |
| 1970 | 0.05 | |
| 1971 | 0.02 | |
| 1972 | 0.02 | |
| 1973 | 0.02 | |
| 1974 | 0.18 | |
| 1975 | 0.28 | JAN. - MAR. |
| 1976 | 0.25 | |
| 1977 | 0.76 | |
| 1978 | 0.40 | |

(2) Nasisi River, Nasisi (39 $km^2$)

| Year | Mean Runoff | Remarks (No record period) |
|---|---|---|
| 1951 | 3.2 | JAN. - OCT. |
| 1952 | 0.8 | |
| 1953 | 1.2 | |
| 1954 | 0.8 | |
| 1955 | 1.3 | |
| 1956 | 1.0 | |
| 1957 | 1.1 | |
| 1958 | 1.3 | |
| 1959 | 1.5 | |
| 1960 | 0.9 | |
| 1961 | 1.6 | |
| 1962 | 1.6 | |
| 1963 | 1.4 | |
| 1964 | 1.3 | |
| 1965 | 1.3 | |
| 1966 | 1.2 | |
| 1967 | 0.9 | |
| 1968 | 1.2 | |
| 1969 | 0.8 | |
| 1970 | 0.6 | AUG. |
| 1971 | 0.6 | AUG. |
| 1972 | 0.7 | |
| 1973 | 1.7 | |
| 1974 | 1.7 | MAY - JUNE |
| 1975 | 0.3 | |
| 1976 | 1.0 | |
| 1977 | 0.4 | |
| 1978 | 1.7 | JULY - SEPT.,<br>DEC. |

(3) Talisay River, Allang (90 $km^2$)

| Year | Mean Runoff | Remarks (No record period) |
|---|---|---|
| 1964 | 0.18 | JAN. - JUNE 24 |
| 1965 | 0.94 | |
| 1966 | 0.16 | |
| 1967 | - | JAN. - DEC. |
| 1968 | 0.01 | AUG. |
| 1969 | 0.01 | |
| 1970 | 0.05 | AUG. - DEC. |
| 1971 | 0.07 | JAN. - MAR.17,<br>JUNE - DEC. |
| 1972 | - | JAN. - DEC. |
| 1973 | 0.08 | |
| 1974 | 0.24 | JAN. - MAR. |
| 1975 | 0.13 | |
| 1976 | 0.02 | |
| 1977 | 1.53 | |

TABLE-I.18 RECORDED ANNUAL MINIMUM MONTHLY MEAN RUNOFF

(1) Quinali River, Busac (232 $km^2$)

| Year | Mean Runoff | Remarks (No record period) |
|---|---|---|
| 1954 | 4.4 | JAN. - MAR.11 |
| 1955 | 5.2 | |
| 1956 | 5.2 | |
| 1957 | 5.5 | |
| 1958 | 4.3 | |
| 1959 | 2.8 | |
| 1960 | 3.4 | |
| 1961 | 2.5 | |
| 1962 | 3.3 | |
| 1963 | 3.4 | |
| 1964 | 2.7 | |
| 1965 | 1.8 | |
| 1966 | 5.0 | |
| 1967 | 3.4 | |
| 1968 | 4.8 | |
| 1969 | 1.8 | |
| 1970 | 3.0 | MAY |
| 1971 | 3.9 | MAR. - DEC. |
| 1972 | - | JAN. - DEC. |
| 1973 | 3.8 | |
| 1974 | 1.8 | |
| 1975 | 3.0 | |
| 1976 | 1.5 | |
| 1977 | 3.2 | |
| 1978 | 7.0 | JULY - SEPT.<br>NOV. - DEC. |

(2) San Agustin River, San Agustin (262 $km^2$)

| Year | Mean Runoff | Remarks (No record period) |
|---|---|---|
| 1960 | 5.6 | |
| 1961 | 9.9 | |
| 1962 | 4.7 | |
| 1963 | - | JAN. - DEC. |
| 1964 | 3.7 | |
| 1965 | 5.0 | |
| 1966 | 1.3 | |
| 1967 | 3.3 | |
| 1968 | 2.1 | |
| 1969 | 0.8 | DEC. |
| 1970 | 3.5 | JAN., MAY, SEPT. |
| 1971 | 2.7 | FEB. |
| 1972 | 5.1 | |
| 1973 | 0.9 | |
| 1974 | 2.6 | |
| 1975 | 3.7 | |
| 1976 | 2.5 | |
| 1977 | 1.5 | |

TABLE-I.19 MONTHLY MEAN RUNOFF

(Unit: $m^3/sec$)

| Station | Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bobongsuran, San Francisco River | (131 $km^2$) | 6.9 | 5.1 | 4.5 | 5.0 | 4.5 | 5.8 | 7.7 | 7.6 | 7.7 | 7.6 | 7.7 | 9.3 | 6.6 |
| Bobongsuran, Cabilogan River | (164 $km^2$) | 12.3 | 8.2 | 7.3 | 8.1 | 8.6 | 10.3 | 13.2 | 14.3 | 13.3 | 14.4 | 15.4 | 17.2 | 11.9 |
| Benanuan, Ogsong River | (11 $km^2$) | 0.9 | 0.7 | 0.6 | 0.6 | 0.8 | 1.0 | 0.9 | 1.0 | 1.3 | 1.7 | 1.8 | 1.6 | 1.1 |
| Nasisi, Nasisi River | (39 $km^2$) | 2.6 | 1.9 | 1.8 | 1.8 | 1.7 | 1.7 | 1.6 | 1.7 | 1.7 | 2.0 | 2.7 | 3.1 | 2.0 |
| Obaliw, Irraya River | (217 $km^2$) | 6.0 | 6.0 | 5.5 | 4.9 | 5.3 | 6.7 | 8.8 | 8.0 | 9.2 | 9.3 | 11.0 | 15.7 | 7.5 |
| Allang, Talisay River | (90 $km^2$) | 2.0 | 1.0 | 0.6 | 0.4 | 1.1 | 2.4 | 4.8 | 3.9 | 5.9 | 3.1 | 6.2 | 8.2 | 3.4 |
| Busac, Quinali River | (232 $km^2$) | 6.0 | 5.8 | 5.5 | 5.8 | 5.3 | 6.3 | 8.1 | 8.1 | 8.3 | 8.9 | 8.8 | 8.4 | 7.1 |
| San Agustin, San Agustin River | (262 $km^2$) | 8.1 | 8.7 | 6.7 | 5.2 | 5.8 | 6.0 | 6.7 | 7.3 | 9.7 | 8.3 | 9.1 | 11.5 | 7.6 |

TABLE-I.20 ESTIMATED ANNUAL SUSPENDED LOAD UNDER PRESENT RIVER CONDITIONS

(Unit: $m^3$)

| Station / Year | Busac, Quinali River (233 $km^2$) | Allang, Talisay River (90 $km^2$) | Remarks |
|---|---|---|---|
| 1954 | * 70,300 | | |
| 1955 | 77,200 | | |
| 1956 | 232,300 | | |
| 1957 | 69,300 | | |
| 1958 | 52,500 | | |
| 1959 | 19,400 | | |
| 1960 | 6,500 | | |
| 1961 | 47,400 | | |
| 1962 | 46,600 | | |
| 1963 | 70,900 | | |
| 1964 | 55,600 | * 63,300 | |
| 1965 | 57,500 | 66,400 | |
| 1966 | 69,600 | 17,500 | |
| 1967 | 164,100 | - | |
| 1968 | 210,200 | 20,900 | |
| 1969 | 9,600 | 5,300 | |
| 1970 | * 23,100 | * 193,000 | |
| 1971 | * 1,400 | * 300 | |
| 1972 | - | - | |
| 1973 | * 217,300 | * 300 | |
| 1974 | 11,700 | * 321,000 | |
| 1975 | 240,300 | * 1,539,800 | |
| 1976 | 127,000 | 142,500 | |
| 1977 | 78,800 | 533,300 | |
| 1978 | * 45,200 | - | |
| Average | 86,400 | 131,000 | |

Note: These sediment loads were estimated based on daily runoff. Specific weight of deposit sediment load was assumed to be 1.2 tons/$m^3$.
The values with astarisk (*) include some interruptions in runoff observation.

TABLE-I.21 ESTIMATED ANNUAL BED LOAD UNDER PRESENT RIVER CONDITIONS

(Unit: $m^3$)

| Station / Year | Busac, Quinali River (233 $km^2$) | San Augstin, San Augstin River (262 $km^2$) | Bacolod Talisay River (164 $km^2$) | Remarks |
|---|---|---|---|---|
| 1954 | * 17,800 | | | |
| 1955 | 18,400 | | | |
| 1956 | 25,600 | | | |
| 1957 | 21,800 | | | |
| 1958 | 16,700 | | | |
| 1959 | 14,700 | | | |
| 1960 | 5,300 | 2,300 | | |
| 1961 | 14,200 | 2,900 | | |
| 1962 | 16,600 | 1,300 | | |
| 1963 | 13,200 | - | | |
| 1964 | 10,900 | 1,800 | * 400 | |
| 1965 | 14,200 | 600 | 600 | |
| 1966 | 16,500 | 1,100 | 200 | |
| 1967 | 16,600 | 1,500 | - | |
| 1968 | 23,600 | 1,200 | * 100 | |
| 1969 | 8,200 | * 400 | 100 | |
| 1970 | * 10,500 | * 1,700 | * 500 | |
| 1971 | * 1,400 | * 2,100 | * 0 | |
| 1972 | - | 2,000 | * 0 | |
| 1973 | 23,400 | 2,400 | * 0 | |
| 1974 | 8,400 | * 1,200 | * 1,600 | |
| 1975 | 27,200 | 2,800 | 3,000 | |
| 1976 | 14,600 | 2,500 | 700 | |
| 1977 | 21,800 | 800 | 2,100 | |
| 1978 | * 12,600 | - | - | |
| Average | 16,600 | 1,800 | 1,100 | |

Note: These sediment loads were estimated based on daily runoff. The values with astarisk (*) include some interruptions in runoff observation.

TABLE-I.22 RECORDED ANNUAL MAXIMUM, MINIMUM AND MEAN GAGE HEIGHT OF LAKE BATO

| Year | Maximam | | Minimum | | Mean |
|---|---|---|---|---|---|
| | Occurrence Date | Gage Height | Occurrence Date | Gage Height | |
| 1960 | Oct. 9 | EL. 9.22 m | Apr. 22 | EL. 5.06 m | EL. 6.44 m |
| 1961 | Sept. 7 | 7.47 | Apr. 30 | 4.82 | 5.93 |
| 1962 | Sept.28 | 7.54 | May 17 | 5.01 | 6.17 |
| 1963 | Aug. 15 | 8.83 | May 31 | 4.67 | 5.77 |
| 1964 | Oct. 1 | 8.61 | June 24 | 4.77 | 5.91 |
| 1965 | July 14 | 8.76 | Apr. 19 | 5.31 | 6.42 |
| 1966 | Dec. 29 | 8.49 | May 8 | 4.94 | 5.92 |
| 1967 | Nov. 5 | 9.36 | June 8 | 4.99 | 6.43 |
| 1968 | Sept.30 | 7.49 | Apr. 26 | 4.81 | 5.52 |
| 1969 | Dec. 14 | 7.55 | May 31 | 3.37 | 5.28 |
| 1970 | Oct. 14 | 10.48 | - | - | - |
| 1971 | July 16 | 7.99 | - | - | - |
| 1972 | Jan. 11 | 8.88 | - | - | - |
| 1973 | Oct. 17 | 9.21 | - | - | - |
| 1974 | Jan. 1 | 8.43 | June 8 | 4.69 | 6.09 |
| 1975 | Dec. 28 | 10.45 | June 12 | 4.78 | 5.93 |
| 1976 | Jan. 1 | 9.71 | May 18 | 4.47 | 6.45 |
| 1977 | Jan. 1 | 8.63 | May 5 | 4.86 | 6.14 |
| 1978 | Sept.28 | 8.53 | Apr. 19 | 4.70 | 5.96 |
| 1979 | Sept.19 | 9.98 | Apr. 2 | 4.70 | 6.20 |

TABLE-III.1 VOLUME OF SEDIMENT FROM COLLAPSE

| Basin | Area of productive collapse ($x10^4m^2$) | Depth (m) | Area of less productive collapse ($x10^4m^2$) | Depth (m) | Volume of sediment from collapse ($x10^3m^3$) |
|---|---|---|---|---|---|
| A- 1 | 0 | | 17 | 2 | 34 |
| 2 | 0 | | 0 | | 0 |
| 8 | 0 | | 0 | | 0 |
| 11 | 24 | 2 | 0 | | 48 |
| 14 | 0 | | 0 | | 0 |
| 17 | 31 | 2 | 0 | | 62 |
| 21 | 0 | | 0 | | 0 |
| 22 | 11 | 3 | 0 | | 33 |
| 25 | 27 | 3 | 3 | 2.5 | 89 |
| 26 | 0 | | 0 | | 0 |
| 28 | 0 | | 0 | | 0 |
| 29 | 9 | 3 | 0 | | 27 |
| 31 | 0 | | 0 | | 0 |
| Y- 1 | 11 | 3 | 11 | 2 | 55 |
| 4 | 24 | 3 | 0 | | 72 |
| 9 | 17 | 3 | 0 | | 51 |
| 11 | 0 | | 0 | | 0 |
| 12 | 49 | 3 | 5 | 2 | 157 |
| O- 1 | 1 | 3 | 16 | 2 | 35 |
| 2 | 0 | | 3 | 2 | 6 |
| 3 | 0 | | 2 | 2 | 4 |
| 4 | 0 | | 0 | | 0 |
| 5 | 44 | 3 | 0 | | 132 |
| 6 | 0 | | 0 | | 0 |
| 7 | 24 | 3 | 0 | | 72 |
| 8 | 7 | 3 | 0 | | 21 |
| 10 | 0 | | 0 | | 0 |
| 13 | 1 | 3 | 0 | | 3 |
| 14 | 0 | | 0 | | 0 |
| 15 | 0 | | 0 | 0 | 0 |
| B- 1 | 0 | | 0 | 0 | 0 |
| 2 | 20 | 3 | 0 | 0 | 60 |
| 4 | 9 | 3 | 1 | 2 | 29 |
| 6 | 0 | | 0 | 0 | 0 |
| 10 | 1 | 3 | 0 | 0 | 3 |
| 19 | 0 | | 0 | 0 | 0 |

TABLE-III.2 VOLUME OF UNSTABLE SEDIMENT

| Basin | Transport zone | | | | | | Sediment zone | | | | | | | | | | Volume of unstable sediment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Unstable | | Moderately unstable | | Stable | | Unstable | | Moderately unstable | | Stable | | Debris flow old | | Debris flow new | | |
| | Area ($x10^4m^2$) | Depth (m) | Area ($x10^4m^2$) | Depth (m) | Area ($x10^4m^2$) | Depth (m) | Area ($x10^4m^2$) | Depth (m) | Area ($x10^4m^2$) | Depth (m) | Area ($x10^4m^2$) | Depth (m) | Area ($x10^4m^2$) | Depth (m) | Area ($x10^4m^2$) | Depth (m) | ($x10^4m^3$) |
| A- 1 | 37 | 2 | 0 | | 0 | | 62 | 2 | 12 | 1.5 | 37 | 1 | 0 | | 11 | 2 | 275 |
| 2 | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| 8 | 0 | | 0 | | 0 | | 19 | 2 | 0 | | 34 | 0.5 | 0 | | 7 | 2 | 69 |
| 11 | 42 | 2 | 0 | | 0 | | 4 | 2 | 3 | 1.5 | 15 | 1 | 0 | | 0 | | 112 |
| 14 | 0 | | 42 | 1.5 | 0 | | 33 | 2 | 16 | 1.5 | 29 | 1 | 11 | 2 | 0 | | 204 |
| 17 | 95 | 2 | 0 | | 0 | | 112 | 1.5 | 20 | 1 | 83 | 0.7 | 0 | | 39 | 1.5 | 495 |
| 21 | 1 | 2 | 0 | | 0 | | 0 | | 1 | 1.5 | 0 | | 0 | | 0 | | 4 |
| 22 | 63 | 2 | 0 | | 1 | 1 | 29 | 2 | 24 | 1.5 | 90 | 1 | 86 | 1.5 | 5 | 2 | 450 |
| 25 | 168 | 2 | 0 | | 0 | | 68 | 2 | 31 | 1.5 | 55 | 1 | 0 | | 0 | | 574 |
| 26 | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| 28 | 0 | | 0 | | 0 | | 38 | 3 | 7 | 2.5 | 47 | 1.5 | 0 | | 0 | | 202 |
| 29 | 30 | 2 | 39 | 1.5 | 6 | 1 | 61 | 2 | 1 | 1.5 | 58 | 1 | 20 | 2 | 0 | | 346 |
| 31 | 0 | | 0 | | 0 | | 13 | 2.5 | 5 | 3 | 0 | | 0 | | 0 | | 48 |
| X- 1 | 26 | 2 | 66 | 1.5 | 0 | | 59 | 2 | 4 | 1.5 | 26 | 1 | 0 | | 61 | 1 | 362 |
| 4 | 47 | 2 | 0 | | 0 | | 29 | 2 | 0 | | 19 | 1 | 0 | | 2 | 1 | 173 |
| 9 | 32 | 2 | 0 | | 17 | 1 | 49 | 2 | 18 | 1.5 | 24 | 1 | 0 | | 50 | 1 | 280 |
| 11 | 0 | | 0 | | 0 | | 5 | 2 | 2 | 1.5 | 0 | | 0 | | 16 | 1 | 29 |
| 12 | 58 | 2 | 0 | | 2 | 1 | 98 | 2 | 2 | 1.5 | 26 | 1 | 52 | 1.5 | 0 | | 421 |
| O- 1 | 37 | 1.5 | 3 | 1 | 19 | 0.7 | 41 | 2 | 0 | | 12 | 1 | 8 | 1 | 0 | | 174 |
| 2 | 0 | | 30 | 1 | 0 | | 35 | 2 | 0 | | 11 | 1 | 6 | 1 | 0 | | 157 |
| 3 | 2 | 1.5 | 44 | 1 | 0 | | 76 | 1.5 | 5 | 0.7 | 13 | 1 | 27 | 1 | 0 | | 205 |
| 4 | 43 | 2 | 0 | | 0 | | 20 | 1.5 | 3 | 1 | 0 | | 0 | | 28 | 1 | 147 |
| 5 | 71 | 3 | 0 | | 51 | 1 | 101 | 2 | 40 | 1.5 | 55 | 1 | 28 | 2 | 0 | | 637 |
| 6 | 0 | | 0 | | 49 | 1 | 71 | 1 | 0 | | 52 | 0.5 | 0 | | 0 | | 146 |
| 7 | 95 | 1 | 47 | 1 | 14 | 0.7 | 48 | 1 | 51 | 0.7 | 66 | 0.5 | 16 | 1.5 | 69 | 1 | 362 |
| 8 | 63 | 1.5 | 31 | 1 | 50 | 0.5 | 35 | 1 | 0 | | 51 | 0.5 | 0 | | 0 | | 211 |
| 10 | 3 | 2 | 1 | 1.5 | 71 | 1 | 40 | 2 | 3 | 1.5 | 0 | | 0 | | 0 | | 163 |
| 13 | 0 | | 69 | 1 | 25 | 0.7 | 85 | 1 | 3 | 0.7 | 28 | 0.5 | 0 | | 0 | | 188 |
| 14 | 0 | | 5 | 1 | 47 | 0.7 | 73 | 1 | 2 | 0.7 | 25 | 0.5 | 0 | | 0 | | 125 |
| 15 | 0 | | 0 | | 0 | | 20 | 1.5 | 18 | 1 | 27 | 0.5 | 0 | | | | 62 |
| B- 1 | 0 | | 72 | 1 | 0 | | 5 | 1.5 | 0 | | 32 | 0.5 | 0 | | 0 | | 96 |
| 2 | 66 | 2 | 42 | 1.5 | 0 | | 37 | 1.5 | 12 | 1 | 28 | 0.7 | 0 | | 0 | | 282 |
| 4 | 32 | 1 | 78 | 0.7 | 39 | 0.5 | 86 | 1.5 | 46 | 1 | 43 | 0.5 | 33 | 0.7 | 58 | 0.5 | 355 |
| 6 | 1 | 1.5 | 0 | | 113 | 0.5 | 1 | 1.5 | 0 | | 0 | | 0 | | 0 | | 60 |
| 10 | 1 | 1.5 | 0 | | 87 | 0.5 | 0 | | 0 | | 0 | | 0 | | 0 | | 45 |
| 19 | 0 | | 1 | 1 | 0 | | 1 | 1.5 | 18 | 1 | 69 | 0.5 | 49 | 1 | 35 | 0.5 | 122 |

TABLE-III.3 ESTIMATED SEDIMENT YIELD

| Basin | Sediment from collapse | Unstable sediment in stream bed | Sediment Yield |
|---|---|---|---|
| A- 1 | 34 | 275 | 309 |
| 2 | 0 | 0 | 0 |
| 8 | 0 | 69 | 69 |
| 11 | 48 | 112 | 160 |
| 14 | 0 | 204 | 204 |
| 17 | 62 | 495 | 557 |
| 21 | 0 | 4 | 4 |
| 22 | 33 | 450 | 483 |
| 25 | 89 | 574 | 663 |
| 26 | 0 | 0 | 0 |
| 28 | 0 | 202 | 202 |
| 29 | 27 | 346 | 373 |
| 31 | 0 | 48 | 48 |
| Y- 1 | 55 | 362 | 417 |
| 4 | 72 | 173 | 245 |
| 9 | 51 | 280 | 331 |
| 11 | 0 | 29 | 29 |
| 12 | 157 | 421 | 578 |
| O- 1 | 35 | 174 | 209 |
| 2 | 6 | 157 | 163 |
| 3 | 4 | 205 | 209 |
| 4 | 0 | 147 | 147 |
| 5 | 132 | 637 | 769 |
| 6 | 0 | 146 | 146 |
| 7 | 72 | 362 | 434 |
| 8 | 21 | 211 | 232 |
| 10 | 0 | 163 | 163 |
| 13 | 3 | 188 | 191 |
| 14 | 0 | 125 | 125 |
| 15 | 0 | 62 | 62 |
| B- 1 | 0 | 96 | 96 |
| 2 | 6 | 282 | 288 |
| 4 | 29 | 355 | 384 |
| 6 | 0 | 60 | 60 |
| 10 | 3 | 45 | 48 |
| 19 | 0 | 122 | 122 |

TABLE-III.4 LIST OF BASINS TO BE EVALUATED

| Basin No. | Basin Name | River System to be belonged | Remarks |
|---|---|---|---|
| A- 1 | Quirangay R. | Quinali (A) River | |
| 2 | Tributary | " | |
| 8 | Tumpa R. | " | |
| 11 | Tributary | " | |
| 14 | Maninila R. | " | |
| 17 | Masarawag R. | " | |
| 21 | Bublusan Cr. | " | |
| 22 | Naborton Cr. | " | |
| 25 | Nasisi R. | " | |
| 26 | Nasisi R. | " | |
| 28 | Nasisi R. | " | |
| 29 | Nasisi R. | " | |
| 31 | Nasisi R. | " | |
| Y- 1 | Anuling R. | Yawa River | |
| 4 | Anuling R. | " | |
| 9 | Budiao R. | " | |
| 11 | Yawa R. | " | |
| 12 | Pawa-Burabod R. | " | |
| O- 1 | Buyuhan (A) R. | East and North-East Streams | |
| 2 | Buyuhan (B) R. | " | |
| 3 | Matang R. | " | |
| 4 | Basud R. | " | |
| 5 | Bacacay R. | " | |
| 6 | Bulawan R. | " | |
| 7 | Tiagao R. | " | |
| 8 | Tiagao R. | " | |
| 10 | Tiagao R. | " | |
| 13 | Tagas R. | " | |
| 14 | Bonbon R. | " | |
| 15 | San Vicente R. | " | |

- to be continued -

| Basin No. | Basin Name | River System to be belonged | Remarks |
|---|---|---|---|
| B- 1 | Quinali (B) R. | Quinali (B) River | |
| 2 | Buang R. | " | |
| 4 | Quinali (B) R. | " | |
| 6 | Tabigyan R. | " | |
| 10 | Bantayan R. | " | |
| 19 | San Francisco R. | " | |

TABLE-IV.1 SEDIMENT RUN-OFF VOLUME
(50-yr Probable Flood)

| Base Point No. | A ($km^2$) | $I_{200}$ | Rd (mm) | C | D ($10^3 m^3$) | Ds ($10^3 m^3/km^2$) |
|---|---|---|---|---|---|---|
| Quilangay R. | (Quinali (A) River Basin) | | | | | |
| No.1 | 4.4 | 0.080 | 515 | 7.0 | 230.0 | 52.3 |
| No.2 | 3.2 | 0.080 | 521 | 7.0 | 124.5 | 38.9 |
| No.3 | 8.9 | 0.064 | 501 | 4.0 | 325.7 | 36.6 |
| No.4 | 10.0 | 0.051 | 500 | 4.0 | 260.1 | 26.0 |
| Tumpa R. | (Quinali (A) River Basin) | | | | | |
| No.1 | 1.2 | 0.100 | 535 | 4.0 | 16.5 | 13.7 |
| No.2 | 2.8 | 0.066 | 523 | 4.0 | 37.4 | 13.3 |
| No.3 | 3.4 | 0.053 | 520 | 4.0 | 35.1 | 10.3 |
| No.4 | 3.5 | 0.048 | 519 | 4.0 | 30.4 | 8.7 |
| No.5 | 1.2 | 0.043 | 534 | 4.0 | 3.0 | 2.5 |
| No.6 | 5.7 | 0.036 | 510 | 4.0 | 43.8 | 7.7 |
| Maninila R. | (Quinali (A) River Basin) | | | | | |
| No.1 | 1.3 | 0.094 | 533 | 10.0 | 42.4 | 32.6 |
| No.2 | 3.3 | 0.063 | 520 | 10.0 | 116.9 | 35.4 |
| No.3 | 4.1 | 0.051 | 516 | 4.0 | 42.6 | 10.7 |
| No.4 | 4.9 | 0.046 | 514 | 7.0 | 94.0 | 19.2 |
| Masarawag R. | (Quinali (A) River Basin) | | | | | |
| No.1 | 4.1 | 0.113 | 516 | 10.0 | 571.5 | 139.4 |
| No.2 | 5.7 | 0.065 | 511 | 10.0 | 358.4 | 62.9 |
| No.3 | 1.0 | 0.059 | 537 | 7.0 | 7.0 | 7.0 |
| No.4 | 7.2 | 0.054 | 506 | 10.0 | 387.0 | 53.8 |
| No.5 | 9.7 | 0.041 | 500 | 7.0 | 276.8 | 28.5 |
| Ogsong R. | (Quinali (A) River Basin) | | | | | |
| No.1 | 3.5 | 0.08 | 519 | 7.0 | 147.8 | 42.2 |
| No.2 | 5.4 | 0.052 | 511 | 7.0 | 144.1 | 26.7 |
| No.3 | 8.3 | 0.034 | 502 | 7.0 | 140.5 | 16.9 |
| Nasisi R. | (Quinali (A) River Basin) | | | | | |
| No.1 | 6.0 | 0.082 | 509 | 10.0 | 627.1 | 104.5 |
| No.2 | 3.4 | 0.078 | 519 | 10.0 | 189.4 | 55.7 |
| No.3 | 11.0 | 0.058 | 496 | 10.0 | 1,001.4 | 91.0 |
| No.4 | 7.7 | 0.057 | 504 | 4.0 | 119.5 | 25.4 |
| No.5 | 5.8 | 0.065 | 510 | 4.0 | 147.9 | 25.5 |
| No.6 | 7.7 | 0.044 | 504 | 4.0 | 116.6 | 15.1 |
| No.7 | 26.7 | 0.037 | 473 | 7.0 | 1,528.6 | 57.3 |
| No.8 | 35.7 | 0.032 | 465 | 4.0 | 1,128.7 | 31.6 |

- to be continued -

TABLE-IV.1 SEDIMENT RUN-OFF VOLUME
(50-yr Probable Flood)

| Base Point No. | A ($km^2$) | $I_{200}$ | Rd (mm) | C | D ($10^3 m^3$) | Ds ($10^3 m^3/km^2$) |
|---|---|---|---|---|---|---|
| Buang R. (Quinali (B) River Basin) | | | | | | |
| No.1 | 4.1 | 0.097 | 510 | 7.0 | 288.0 | 70.2 |
| No.2 | 4.7 | 0.073 | 507 | 7.0 | 211.8 | 45.1 |
| No.3 | 8.1 | 0.048 | 496 | 4.0 | 148.8 | 18.4 |
| No.4 | 19.2 | 0.031 | 475 | 4.0 | 319.7 | 16.6 |
| Anuling R. (Yawa River Basin) | | | | | | |
| No.1 | 3.6 | 0.093 | 790 | 7.0 | 489.7 | 136.0 |
| No.2 | 2.1 | 0.114 | 803 | 4.0 | 147.8 | 70.4 |
| No.3 | 4.7 | 0.059 | 783 | 7.0 | 329.9 | 70.2 |
| No.4 | 4.0 | 0.060 | 787 | 4.0 | 142.7 | 35.7 |
| No.5 | 9.4 | 0.045 | 762 | 4.0 | 415.6 | 44.2 |
| Budiro R. (Yawa River Basin) | | | | | | |
| No.1 | 2.2 | 0.110 | 802 | 10.0 | 376.7 | 171.2 |
| No.2 | 3.2 | 0.070 | 793 | 7.0 | 220.8 | 69.0 |
| No.3 | 7.5 | 0.042 | 769 | 4.0 | 234.6 | 31.3 |
| Pawa-Burabod R. (Yawa River Basin) | | | | | | |
| No.1 | 4.2 | 0.100 | 786 | 10.0 | 1,089.8 | 259.5 |
| No.2 | 6.2 | 0.074 | 774 | 7.0 | 882.7 | 142.4 |
| No.3 | 7.6 | 0.043 | 768 | 7.0 | 440.9 | 58.0 |

Note: A - drainage area

$I_{200}$ - average river bed slope from the point concerned up to the point 200 m higher in altitude

Rd - daily rainfall

C - coefficient

D - sediment run-off volume

Ds - specific sediment run-off volume

TABLE-IV.2 ESTIMATED BED LOAD AMOUNT

(Allowable Sediment Volume)

| Item / River Name | Drainage area ($km^2$) | River bed slope | River bed width (m) | Mean diameter of river bed materials(m) | Bed load ($10^3m^3$) | River basin |
|---|---|---|---|---|---|---|
| Quirangay R. | 10.0 | 0.033 | 15 | 0.015 | 82.6 | Quinali(A) |
| Tumpa R. | 5.7 | 0.0183 | 20 | 0.015 | 35.2 | " |
| Maninila R. | 5.7 | 0.025 | 15 | 0.022 | 36.7 | " |
| Masarawag R. | 9.7 | 0.022 | 20 | 0.010 | 77.6 | " |
| Ogsong R. | 8.3 | 0.015 | 30 | 0.071 | 32.7 | " |
| Nasisi R. | 35.7 | 0.011 | 40 | 0.071 | 85.9 | " |
| Quinali(B) R. | 19.2 | 0.029 | 30 | 0.071 | 143.7 | Quinali(B) |
| Anuling R. | 9.4 | 0.02 | 30 | 0.0296 | 85.8 | Yawa |
| Budiao R. | 7.5 | 0.02 | 15 | 0.0295 | 58.1 | " |
| Pawa-Burabod R. | 7.6 | 0.019 | 30 | 0.0295 | 69.5 | " |

TABLE-IV.3 EXCESS SEDIMENT VOLUME
(50-yr Probable Flood)

(unit: $10^3 m^3$)

| River Name | River Basin | Sediment Run-off Volume | Allowable Sediment Volume | Excess Sediment Volume |
|---|---|---|---|---|
| Quirangay River | Quinali (A) | 260.1 | 82.6 | 177.5 |
| Tumpa River | " | 43.7 | 35.2 | 8.5 |
| Maninila River | " | 94,0 | 36.7 | 57.3 |
| Masaraga River | " | 276.8 | 77.6 | 199.2 |
| Ogsong River | " | 140.5 | 32.7 | 107.8 |
| Nasisi River | " | 1,128.7 | 85.9 | 1,042.8 |
| Quinali(B)River | Quinali (B) | 319.7 | 143.7 | 176.0 |
| Anuling River | Yawa | 415.6 | 85.8 | 329.8 |
| Budiao River | " | 234.6 | 58.1 | 176.5 |
| Pawa-Burabod R. | " | 440.9 | 69.5 | 371.4 |

TABLE-V.1 INUNDATION CALCULATION FOR THE QUINALI (A) RIVER BASIN INCLUDING THE TALISAY RIVER

| (1) Return Period (yr) | (2) Basin Average Rainfall (mm) | (3) Quinali (A) Discharge ($m^3$/sec) | (4) Inundation Area ($km^2$) | (5) Inundation Depth (m) | (6) Inundation Duration (days) |
|---|---|---|---|---|---|
| 100 | 665 | 50 | 89 | 2.66 | 3 |
| (100) | (665) | (760) | (74) | (0.71) | ( 1) |
| 50 | 593 | 50 | 89 | 2.35 | 3 |
| 20 | 497 | 50 | 89 | 1.95 | 2 - 3 |
| 10 | 422 | 50 | 89 | 1.63 | 2 - 3 |
| 5 | 345 | 50 | 89 | 1.31 | 2 - 3 |
| 2 | 228 | 50 | 89 | 0.82 | 1 - 2 |
| 1.01 | 74 | 50 | 89 | 0.17 | 0 |

Note: (1) $(5) = \left\{(2) \times 535 \times 10^6 \times 0.7 - (3) \times 86{,}400 \times 3\right\} \div (89 \times 10^6)$

(2) Rainfall duration is 3 days.

(3) Figures in ( ) are those in with-project condition and others are in without-project condition.

(4) In with-project condition, no inundation is caused by the probable flood with return period of less than 50-year.

## TABLE-V.2 INUNDATION CALCULATION FOR THE QUINALI (B) RIVER BASIN

| (1) Return Period (yr) | (2) Basin Average Rainfall (mm) | (3) Quinali (B) Discharge ($m^3$/sec) | (4) Inundation Area ($km^2$) | (5) Inundation Depth (m) | (6) Inundation Duration (days) |
|---|---|---|---|---|---|
| 100 | 446 | 250 | 11.9 | 2.33 | 2 - 3 |
| (100) | (446) | (465) | (11.9) | (0.77) | ( 1) |
| 50 | 406 | 250 | 11.9 | 1.96 | 2 - 3 |
| 20 | 353 | 250 | 11.9 | 1.47 | 1 - 2 |
| 10 | 311 | 250 | 11.9 | 1.08 | 1 - 2 |
| 5 | 267 | 250 | 11.9 | 0.67 | 1 |
| 2 | 201 | 250 | 11.9 | - | - |
| 1.01 | 105 | 250 | 11.9 | - | - |

Note: (1) $(5) = \left\{(2) \times 158 \times 10^6 \times 0.7 - (3) \times 86{,}400\right\} \div (11.9 \times 10^6)$

(2) Hyphen (-) means no inundation.

(3) Rainfall duration is 1 day.

(4) Figures in ( ) are those in with-project condition and others are in without-project condition.

(5) In with-project condition, no inundation is caused by the probable flood with return period of less than 50-year.

TABLE-V.3 FLOODING DEPTH OF AREA (A) IN THE QUINALI (B) RIVER BASIN

| (1) Return Period (yr) | (2) Peak Runoff ($m^3$/sec) | (3) Flooding Depth (Without Project) (m) | (4) Flooding Depth (With Project) (m) | (5) Flooding Duration (days) |
|---|---|---|---|---|
| 100 | 2,490 | 1.90 | 1.25 | 1 |
| 50 | 2,142 | 1.75 | - | - |
| 20 | 1,732 | 1.55 | - | - |
| 10 | 1,420 | 1.40 | - | - |
| 5 | 1,106 | 1.20 | - | - |
| 2 | 704 | 0.90 | - | - |
| 1.01 | 407 | 0.75 | - | - |

Note: (1) Slope of Ground Surface 1/170
(2) Roughness Coefficient 0.060
(3) Hyphen (-) means no flooding.

TABLE-V.4 FLOODING DEPTH OF AREA (B) IN THE QUINALI (B) RIVER BASIN

| (1) Return Period (yr) | (2) Peak Runoff (Sec. B-1) ($m^3$/sec) | (3) Peak Runoff (Sec. B-2) ($m^3$/sec) | (4) Flooding Depth (Sec. B-1) (m) | (5) Flooding Depth (Sec. B-2) (m) |
|---|---|---|---|---|
| 100 (100) | 578 (578) | 306 (306) | 0.65 (0.65) | 0.29 (0.29) |
| 50 | 492 | 261 | 0.59 | 0.27 |
| 20 | 396 | 210 | 0.52 | 0.23 |
| 10 | 321 | 170 | 0.46 | 0.21 |
| 5 | 248 | 131 | 0.39 | 0.18 |
| 2 | 155 | 82 | 0.30 | 0.13 |
| 1.01 | 91 | 48 | 0.22 | 0.10 |

Note: (1) Slope of Ground Surface Sec. B-1 1/150
Sec. B-2 1/200

(2) Roughness Coefficient 0.060

(3) Figures in ( ) are those in with-project condition and others are in without-project condition.

(4) In with-project condition, no flooding is caused by the probable flood with return period of less than 50-year.

TABLE-V.5 FLOODING DEPTH IN THE YAWA RIVER BASIN

| (1) Return Period (yr) | (2) Peak Runoff ($m^3$/sec) | (3) Yawa R. Discharge ($m^3$/sec) | (4) Flooding Depth (m) | (5) Flooding Duration (days) |
|---|---|---|---|---|
| 100 (100) | 2,711 (2,711) | 550 (810) | 2.54 (2.09) | 1 ( 1) |
| 50 | 2,142 | 550 | 2.13 | 1 |
| 20 | 1,547 | 550 | 1.66 | 1 |
| 10 | 1,163 | 550 | 1.28 | 1 |
| 5 | 832 | 550 | 0.86 | 1 |
| 2 | 470 | 470 | - | - |
| 1.01 | 256 | 256 | - | - |

Note: (1) Slope of Ground Surface 1/1,000

(2) Roughness Coefficient 0.060 - 0.100

(3) Hyphen (-) means no flooding.

(4) Figures in ( ) are those in with-project condition and others are in without-project condition.

(5) In with-project condition, no flooding is caused by the probable flood with return period of less than 50-year.

TABLE-V.6 SEDIMENT BALANCE OF THE QUINALI (A) RIVER MAIN COURSE

(Unit: $m^3/sec$)

| Section | 50-yr Flood | | 10-yr Flood | | 1.01-yr Flood | |
|---|---|---|---|---|---|---|
| | Water Discharge | Sediment Discharge | Water Discharge | Sediment Discharge | Water Discharge | Sediment Discharge |
| Sta.23+000 | 2,710 | 0.41 | 1,790 | 0.26 | 330 | 0.18 |
| Sta.13+000 | 2,710 | 0.33 | 1,790 | 0.24 | 330 | 0.05 |
| Sta.12+000 | 3,010 | 0.36 | 1,790 | 0.21 | 380 | 0.05 |
| Sta. 8+000 | 3,010 | 0.23 | 2,030 | 0.15 | 380 | 0.03 |
| Sta. 6+000 | 3,020 | 0.23 | 2,050 | 0.15 | 390 | 0.03 |
| Sta. 4+000 | 3,020 | 0.13 | 2,050 | 0.12 | 390 | 0.01 |
| Sta. 2+000 | 4,260 | 0.20 | 2,910 | 0.21 | 550 | 0.01 |

TABLE-V.7 SEDIMENT BALANCE OF THE NASISI RIVER

(Unit: $m^3/sec$)

| Section | 50-yr Flood | | 10-yr Flood | | 1.01-yr Flood | |
|---|---|---|---|---|---|---|
| | Water Discharge | Sediment Discharge | Water Discharge | Sediment Discharge | Water Discharge | Sediment Discharge |
| Sta. 7+000 | 920 | 1.57 | 560 | 0.66 | 100 | 0.04 |
| Sta. 5+000 | 920 | 1.04 | 560 | 0.45 | 100 | 0.03 |
| Sta. 3+000 | 920 | 0.81 | 560 | 0.35 | 100 | 0.03 |
| Sta. 2+000 | 920 | 0.22 | 560 | 0.10 | 100 | 0.01 |
| Sta. 0+000 | 1,660 | 0.07 | 1,050 | 0.23 | 190 | 0.02 |

TABLE-V.8 SEDIMENT BALANCE OF THE TALISAY RIVER

(Unit: $m^3$/sec)

| Section | 50-yr Flood | | 10-yr Flood | | 1.01-yr Flood | |
|---|---|---|---|---|---|---|
| | Water Discharge | Sediment Discharge | Water Discharge | Sediment Discharge | Water Discharge | Sediment Discharge |
| Sta. 7+000 | 1,970 | 0.28 | 1,330 | 0.23 | 310 | 0.02 |
| Sta. 5+000 | 1,970 | 0.18 | 1,330 | 0.14 | 310 | 0.02 |
| Sta. 3+000 | 1,970 | 0.19 | 1,330 | 0.14 | 310 | 0.02 |
| Sta. 2+000 | 1,970 | 0.15 | 1,330 | 0.01 | 310 | 0.02 |
| Sta. 0+000 | 1,980 | 0.10 | 1,360 | 0.01 | 330 | 0.01 |

TABLE-V.9 SEDIMENT BALANCE OF THE QUINALI (B) RIVER

(Unit: $m^3$/sec)

| Section | 50-yr Flood | | 10-yr Flood | | 1.01-yr Flood | |
|---|---|---|---|---|---|---|
| | Water Discharge | Sediment Discharge | Water Discharge | Sediment Discharge | Water Discharge | Sediment Discharge |
| Sta.13+000 | 1,930 | 3.72 | 1,260 | 2.24 | 360 | 0.51 |
| Sta.11+000 | 1,930 | 4.54 | 1,260 | 2.81 | 360 | 0.59 |
| Sta.10+000 | 2,150 | 2.84 | 1,420 | 1.64 | 410 | 0.31 |
| Sta. 7+000 | 2,150 | 0.43 | 1,420 | 0.20 | 410 | 0.03 |
| Sta. 4+000 | 2,150 | 0.28 | 1,420 | 0.09 | 410 | 0.03 |
| Sta. 3+000 | 2,220 | 0.22 | 1,500 | 0.10 | 440 | 0.01 |
| Sta. 2+000 | 2,420 | 0.17 | 1,650 | 0.08 | 490 | 0.01 |
| Sta. 1+000 | 2,420 | 0.06 | 1,650 | 0.02 | 490 | 0.01 |

TABLE-V.10 SEDIMENT BALANCE OF THE YAWA RIVER

(Unit: $m^3/sec$)

| Section | 50-yr Flood | | 10-yr Flood | | 1.01-yr Flood | |
|---|---|---|---|---|---|---|
| | Water Discharge | Sediment Discharge | Water Discharge | Sediment Discharge | Water Discharge | Sediment Discharge |
| Sta. 1+000 | 2,150 | 1.33 | 1,170 | 0.49 | 260 | 0.08 |
| Sta. 0+000 | 2,150 | 0.15 | 1,170 | 0.06 | 260 | 0.01 |

TABLE-VI.1 IRRIGATION WATER RESOURCES IN THE PROJECT AREA

| Irrigation System | Water resources |
|---|---|
| **Quinali (A) River Basin** | |
| Irrigation systems in lower and middle reach | Surface water of the Quinali (A) River and its tributaries. |
| Irrigation systems in upper reach | Spring water in the slope of Mayon Volcano. |
| **Quinali (B) River Basin** | |
| Irrigation system in middle reach | Spring water in the slope of Mayon Volcano. |
| Irrigation system in lower reach | Surface water of the Quinali (B) River and its tributaries |

TABLE-VI.2 RESULTS OF WATER QUALITY ANALYSIS

| Item | | Quinali (A) River | | Cabilogan River |
|---|---|---|---|---|
| | | South Quinali | Agos-Sta. Cruz | Cabilogan |
| Conductivity | mmhos/cm | 250 | 200 | 300 |
| Alkalinity | mg/l | 138 | 142 | 177 |
| Chloride | mg/l | 3 | 5 | 6 |
| Hardness | mg/l | 134 | 116 | 166 |
| Iron | mg/l | 0.8 | 0.8 | 0.13 |
| pH | | 6.8 | 7.0 | 7.0 |
| Total solids | mg/l | 230 | 190 | 250 |
| Calcium | mg/l | 29 | 25 | 43 |
| Manganese | mg/l | Nil | Nil | Nil |
| Magnesium | mg/l | 15 | 13 | 15 |
| Sulfate | mg/l | 25 | Nil | 30 |
| Boron | mg/l | Nil | Nil | Nil |

TABLE-VI.3 NUMBER OF FARM HOUSEHOLD IN THE PROJECT AREA IN 1980

| Name of Municipality | Total Household | Barangay Filled Form | Results of Sample Survey | | Composition of Farm Household | Estimated Farm Household |
|---|---|---|---|---|---|---|
| | | | No. of Household | No. of Farm Household | | |
| Legazpi City | 6,025 | 11 | 3,539 | 1,217 | - | 2,070 |
| Polangui | 6,541 | 20 | 5,686 | 2,400 | - | 2,760 |
| Oas | 5,297 | 6 | 1,583 | 985 | - | 3,300 |
| Libon | 4,419 | 10 | 2,257 | 2,106 | - | 4,120 |
| Daraga | 7,334 | - | - | - | 69.0% | 5,060 |
| Camalig | 4,964 | 9 | 2,271 | 1,541 | - | 3,370 |
| Guinobatan | 4,945 | 4 | 779 | 467 | - | 2,960 |
| Bacacay | 4,048 | 9 | 1,714 | 913 | - | 2,160 |
| Malinao | 3,893 | 10 | 2,009 | 1,171 | - | 2,270 |
| Tabaco | 11,243 | - | - | - | 54.5% | 6,120 |
| Malilipot | 3,672 | - | - | - | 25.0% | 920 |
| Ligao | 7,904 | 4 | 1,020 | 377 | - | 2,920 |
| St. Domingo | 3,092 | - | - | - | 37.3% | 1,160 |
| Total: | 73,377 | | | | | 39,190 |

TABLE-VI.4 LAND HOLDING DISTRIBUTION IN THE PROJECT AREA

| Municipality | Barangay that Filled Form | Land Holding Distribution of Farm Household | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample | | | | | Estimation | | | | |
| | | (ha) 0-0.9 | 1.0-1.9 | 2.0-2.9 | 3.0-3.9 | 4.0- | (ha) 0-0.9 | 1.0-1.9 | 2.0-2.9 | 3.0-3.9 | 4.0- |
| Camalig | 4 | 336 | 175 | 80 | 38 | 30 | 2,531 | 1,318 | 603 | 286 | 226 |
| Guinobatan | 3 | 145 | 28 | 30 | 40 | 0 | 2,951 | 570 | 610 | 814 | 0 |
| Bacacay | 6 | 171 | 76 | 32 | 9 | 27 | 2,197 | 977 | 411 | 116 | 347 |
| Malinao | 15 | 415 | 417 | 65 | 16 | 13 | 1,745 | 1,753 | 273 | 67 | 55 |
| Polangui | 12 | 465 | 292 | 204 | 96 | 26 | 2,808 | 1,764 | 1,232 | 580 | 157 |
| Oas | 7 | 533 | 243 | 80 | 19 | 3 | 3,216 | 1,466 | 483 | 115 | 18 |
| Libon | 8 | 950 | 123 | 47 | 23 | 5 | 3,657 | 473 | 180 | 89 | 19 |
| Ligao | 13 | 82 | 42 | 21 | 11 | 1 | 4,128 | 2,114 | 1,057 | 554 | 50 |
| Legazpi | 11 | 712 | 218 | 94 | 49 | 58 | 3,793 | 1,161 | 501 | 261 | 309 |
| Total | 69 | | | | | | 27,026 | 11,596 | 3,350 | 2,882 | 1,181 |
| Distribution | | | | | | | 56 % | 24 % | 11 % | 6 % | 3 % |

TABLE-VI.5 LAND TENURE IN THE PROJECT AREA

(Unit: No. of farm household)

| Municipality | Barangay that Filled Form | Sample | | | | | Estimation | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Own Cultivator | Amortizing Owner | Lease Holder | Share Tenant | Mixed Tenure | Own Cultivator | Amortizing Owner | Lease Holder | Share Tenants | Mixed Tenure |
| Camalig | 4 | 60 | 5 | 235 | 110 | 0 | 726 | 60 | 2,845 | 1,332 | 0 |
| Guinobatan | 3 | 56 | 43 | 161 | 15 | 0 | 1,007 | 773 | 2,895 | 270 | 0 |
| Bacacay | 6 | 249 | 25 | 133 | 24 | 28 | 2,196 | 220 | 1,173 | 212 | 247 |
| Malinao | 15 | 75 | 115 | 560 | 53 | 20 | 355 | 544 | 2,649 | 251 | 95 |
| Polangui | 12 | 532 | 307 | 442 | 256 | 8 | 2,252 | 1,300 | 1,871 | 1,084 | 34 |
| Oas | 7 | 79 | 241 | 485 | 40 | 3 | 493 | 1,505 | 3,030 | 250 | 19 |
| Libon | 8 | 74 | 605 | 137 | 30 | 18 | 378 | 3,094 | 701 | 153 | 92 |
| Ligao | 3 | 46 | 33 | 112 | 201 | 83 | 765 | 549 | 1,864 | 3,344 | 1,381 |
| Legaspi | 11 | 20 | 0 | 158 | 30 | 0 | 579 | 0 | 4,577 | 869 | 0 |
| | 69 | | | | | | 8,751 | 8,045 | 21,605 | 7,765 | 1,868 |
| | | | | | | | 18 % | 17 % | 45 % | 16 % | 4 % |

TABLE-VI.6 PRESENT LAND USE IN THE PROJECT AREA

| | Land Category | Area | Composition |
|---|---|---|---|
| 1. | Residental area | 2,759 ha | 4.0% |
| 2. | School | 97 | 0.1 |
| 3. | Church | 2 | 0.0 |
| 4. | Reclaimed area | 38 | 0.0 |
| 5. | Air port | 36 | 0.0 |
| 6. | Golf course | 65 | 0.1 |
| 7. | Agricultural land | 44,712 | 64.0 |
| | - Paddy field | (21,700) | (31.1) |
| | - Upland | (1,879) | (2.7) |
| | - Coconut field | (20,880) | (29.9) |
| | - Abaca field | (131) | (0.2) |
| | - Citrus field | (122) | (0.2) |
| 8. | Fish pond | 15 | 0.0 |
| 9. | Forest | 10,182 | 14.6 |
| 10. | Bush | 1,697 | 2.4 |
| 11. | Nipa field | 268 | 0.4 |
| 12. | Grass land | 7,720 | 11.0 |
| 13. | Bare land | 1,845 | 2.6 |
| 14. | Water surface | 466 | 0.7 |
| | Total: | 69,902 | (100.0) |

TABLE-VI.7 CONSUMPTION OF FARM INPUT FOR RICE CULTIVATION IN THE PROJECT AREA

(Unit: kg/ha)

| Municipality | Baragays Filled Form | Seed | Urea | Ammonium Phosphate | Ammonium Sulphate | N.P.K. Compound | Super Phosphate |
|---|---|---|---|---|---|---|---|
| Polangui | 11 | 94 | 121 | 47 | 65 | 60 | - |
| Oas | 9 | 50 | 65 | 25 | 25 | 63 | - |
| Lison | 8 | 64 | - | - | - | - | - |
| Ligao | 19 | 50 | 122 | 42 | 29 | 95 | 32 |
| Legazpi City | 18 | 50 | 113 | 45 | 47 | 82 | 5 |
| Camalig | 6 | 49 | 118 | 125 | 60 | 110 | 17 |
| Guinobatan | 2 | 59 | 100 | 75 | 25 | 175 | - |
| Bacacay | 5 | 65 | 100 | 96 | 12 | 186 | 12 |
| Malinao | 16 | 49 | 116 | 84 | 17 | 69 | - |
| Tabaco | 2 | 57 | 95 | 48 | 15 | 11 | - |
| St. Domingo | 1 | 46 | 50 | 50 | - | 50 | - |
| Daraga | - | 50 | - | - | - | 250 | - |
| Average | | 57 | 91 | 58 | 27 | 100 | |

TABLE-VI.8 PALAY YIELD OF IRRIGATED RICE IN SAMPLE SURVEY AREAS OF THE PROJECT AREA

| Municipality | Harvested Area (ha) | | | Production (Cavan) | | | Average Yield (Cavan/ha) | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1979 Dry | 1979 Wet | 1980 Dry | 1979 Wet | 1979 Dry | 1980 Dry | 1979 Dry | 1979 Wet | 1980 Dry |
| Libon | 878 | 878 | - | 64,740 | 48,800 | - | 73 | 55 | - |
| Oas | 174 | 956 | 782 | 13,770 | 62,300 | 58,820 | 79 | 65 | 75 |
| Ligao | - | 763 | 686 | - | 49,910 | 44,530 | - | 65 | 65 |
| Polangui | 327 | 889 | 562 | 32,550 | 79,170 | 41,000 | 99 | 98 | 72 |
| Guinobatan | 10 | 80 | 70 | 490 | 5,130 | 4,770 | 49 | 64 | 68 |
| Camalig | 231 | 413 | 82 | 10,920 | 19,300 | 4,680 | 47 | 46 | 57 |
| Daraga | - | - | - | - | - | - | - | - | - |
| Lagazpi City | 406 | 592 | 158 | 20,630 | 29,000 | 9,700 | 51 | 49 | 61 |
| St. Domingo | - | 461 | 461 | - | 26,730 | 26,840 | - | 58 | 58 |
| Bacacay | - | 290 | 275 | - | 22,030 | 18,260 | - | 76 | 66 |
| Malilipot | (199) | | - | (3,888) | | - | (195) | | |
| Tabaco | (918) | | | (116,860) | | - | (127) | | |
| Milinao | - | 981 | 981 | - | 67,130 | 63,380 | - | 68 | 65 |
| Average | 2,026 | 6,304 | 4,501 | 143,110 | 409,490 | 300,780 | 70 | 65 | 67 |

Remark: Seasonal differences in the harvested area and the production do not express the actual ones.

TABLE-VI.9 ESTIMATED PALAY PRODUCTION IN THE PROJECT AREA IN 1979

| Season and Planted Condition | River Basin | | | | Total Project Area |
|---|---|---|---|---|---|
| | Quinali (A) | Quinali (B) | Yawa | East-Northeast | |
| (1) Area of Palay Field (ha) | | | | | |
| Gross Palay Field | | | | | |
| - Irrigated | 8,530 | 990 | 380 | 2,500 | 12,400 |
| - Rainfed | 3,870 | 2,010 | 170 | 3,250 | 9,300 |
| Total: | 12,400 | 3,000 | 550 | 5,750 | 21,700 |
| Net (Planted) Palay Field | | | | | |
| - Irrigated | 6,320 | 810 | 270 | 2,000 | 9,400 |
| - Rainfed | 3,050 | 1,590 | 130 | 2,330 | 7,100 |
| Total: | 9,370 | 2,400 | 400 | 4,330 | 16,500 |
| (2) Average Yield of Palay Estimated (ton/ha) | | | | | |
| Wet Season Palay | | | | | |
| - Irrigated | 3.1 | 3.1 | 2.4 | 2.9 | 3.0 |
| - Rainfed | 1.7 | 1.7 | 1.3 | 1.6 | 1.6 |
| Dry Season Palay | | | | | |
| - Irrigated | 3.3 | 3.3 | 2.5 | 3.1 | 3.2 |
| - Rainfed | - | - | - | - | - |
| (3) Estimated Palay Production (1,000 tons) | | | | | |
| Wet Season Palay | 24.8 | 5.2 | 0.8 | 9.6 | 40.4 |
| Dry Season Palay | 20.9 | 2.7 | 0.7 | 6.2 | 30.5 |
| Total: | 45.7 | 7.9 | 1.5 | 15.8 | 70.9 |

TABLE-VI.10 FARM GATE PRICES OF AGRICULTURAL PRODUCTS IN ALBAY PROVINCE

(Unit: Pesos)

| Item | Unit | 1979 Dec. | 1980 Jan. | Feb. | Mar. | Apr. | May | Jun. | Average |
|---|---|---|---|---|---|---|---|---|---|
| Palay (Special) | 50 kg | 48 | 48 | 50 | 49 | 50 | 51 | 51 | 50 |
| " (Ordinary) | 50 kg | 45 | 45 | 48 | 48 | 48 | 48 | 45 | 47 |
| Shelled Corn (White) | 50 kg | 45 | 45 | 45 | 50 | 60 | 49 | 55 | 50 |
| " (Yellow) | 50 kg | 46 | 47 | 47 | 52 | 54 | 53 | 55 | 51 |
| Copra (Corriente) | 100 kg | 214 | 211 | 204 | 144 | 130 | 96 | 124 | 160 |
| Matured Coconut | 100 nuts | 78 | 78 | 65 | 54 | 48 | 47 | 58 | 61 |
| Abaca Fiber | 1 kg | 2.75 | 2.56 | 2.64 | 2.74 | 2.65 | 2.58 | 2.38 | 2.61 |
| Dry Coffee Beans | 1 ganta | 55 | 54 | 54 | | | 38 | 38 | 48 |
| Dry Cacao | 1 ganta | 70 | 70 | 67 | | | | | 69 |
| Green Banana | | | | | | | | | |
| " (Bmgulan) | 100 fingers | 9.83 | 10.94 | 11.19 | 12.25 | 12.52 | 10.92 | 10.75 | 11.2 |
| " (Lafundan) | 100 pieces | 8.00 | 9.12 | 9.50 | 9.83 | 9.56 | 8.21 | 7.92 | 8.88 |
| " (Lacatan) | " " | 20.00 | 22.00 | 22.00 | 15.50 | 15.50 | 20.00 | 18.00 | 17.57 |
| " (Laba) | " " | 10.25 | 11.25 | 11.38 | 11.38 | 11.43 | 11.00 | 11.00 | 11.00 |
| Avocado | " " | | | | 12.50 | 12.50 | | 30.00 | 18.33 |
| Calamansi | " " | 1.90 | | 3.24 | 3.00 | 3.83 | 2.17 | 2.00 | 2.69 |
| Papaya (Hawaian) | " " | 123 | 128 | 154 | 150 | 150 | | | 141 |
| " (Native) | " " | 15 | 15 | 16 | 10 | 10 | 15 | 17 | 14 |
| Pine Apple | " " | 100 | 100 | 125 | 150 | 150 | 200 | 100 | 132 |
| Water Melon | " " | | 85 | 75 | | | | | 80 |
| Jack Fruit | 1 unit | 1.41 | 0.65 | 0.61 | 1.12 | 1.08 | 4.0 | 4.0 | 1.84 |
| Ampalaya (Long variety) | 100 pieces | 35 | 33 | 30 | 30 | 35 | | | 33 |
| Chayote | " " | 20 | 20 | 20 | | | 30 | 20 | 22 |
| Eggplant | " " | 16.7 | 13.5 | 14.5 | 20.0 | 20.0 | 20.0 | 16.0 | 17.24 |
| Tomato | 1 kg | 2.83 | 2.73 | 1.88 | 1.25 | 1.26 | 1.08 | 1.90 | 1.85 |
| Squash | 100 pieces | 70 | 60 | 65 | | | | | 65 |
| Cabbage | 1 kg | 2.05 | 2.10 | 2 | | | | | 2.05 |
| Sweet Potato 1 can | (14-15 kg) | 8.50 | 8.67 | 8,72 | 7.60 | 7.55 | 7.43 | 7.25 | 7.96 |
| Cassava 1 can | | 7.58 | 7.56 | 7.75 | 6.56 | 6.69 | 6.75 | 6.75 | 7.09 |
| Taro 1 can | | 10.83 | 9.08 | 9.33 | 11.00 | 12.00 | | | 10.45 |
| Ginger (Hawaian) | 1 kg | 1.50 | 1.50 | 8.75 | 10 | 10 | | | 6.35 |
| " (Native) | " | 4.75 | 5.00 | 5.00 | | | 16.00 | 16.00 | 9.35 |



- to be continued -

(Continued)

| Item | Unit | 1979 Dec. | 1980 Jan. | Feb. | Mar. | Apr. | May | Jun. | Average |
|---|---|---|---|---|---|---|---|---|---|
| Peanut (Unshelled) | 20 kg | 90 | 90 | 95 | | | | | 92 |
| Goat (6 months old and over) | 1 Head | | | | 130 | 130 | 130 | 130 | 130 |
| " (Blow 6 months) | " | | | | 60 | 60 | 60 | 60 | 60 |
| Upgraded Hog (6 months old and over) | " | 810 | 814 | 794 | 825 | 850 | 833 | 833 | 823 |
| " (Blow 6 months) | " | 100 | 100 | 100 | 120 | 120 | 120 | | 110 |
| Cattle for Slaughter | 1 kg | 8 | 8 | 8 | | | | | 8 |
| Carabao (Infant) | 1 Head | | | | | | | | 500 |
| " (Adult) | " | | | | | | | | 3,000 |
| Chicken (Native) | 1 Bird | 11.89 | 12.11 | 12.16 | 11.57 | 12.86 | 12.77 | 12.69 | 12.29 |
| Roaster | " | 13.00 | 13.16 | 13.17 | 13.71 | 14.00 | 14.12 | 13.81 | 13.57 |
| Pullet | " | 7.58 | 8.08 | 8.00 | 8.50 | 8.64 | 9.10 | 9.10 | 8.43 |
| Cockerel | " | 7.58 | 8.08 | 8.00 | 8.64 | 8.79 | 9.30 | 9.30 | 8.53 |
| Native Chicken Egg | 1 Dozen | 6.64 | 6.77 | 6.77 | 7.92 | 8.40 | 6.95 | 6.95 | 7.20 |
| Egg (Other breeds) | " | | 7.80 | 7.80 | 8.40 | 8.40 | | | 8.10 |
| Dick Egg | " | | 7.20 | 7.20 | 8.60 | 7.80 | | | 7.45 |

Source: BAEcon, LEGASPI, 1980

TABLE-VI.11 RETAIL PRICES OF AGRICULTURAL COMMODITY IN ALBAY PROVINCE IN 1980

(Unit: Pesos)

| | | |
|---|---|---|
| **A. Fertilizer** | | |
| Urea (45-0-0) | 1 bag (50 kg) | 96.50 |
| Ammonium sulfate (21-0-0) | " | 68.75 |
| Compound (14-14-14) | " | 83.85 |
| Ammonium phosphate | " | 90.30 |
| **B. Agri-chemicals** | | |
| (i) Pesticide | | |
| Endrin | 1 pint | 15.80 |
| Polidol | " | 29.00 |
| Thiodan | " | 26.90 |
| Brodan | " | 40.30 |
| Gusathion | " | 37.00 |
| Tomato set | " | 9.30 |
| Aldrex | " | 13.25 |
| (ii) Fungicide | | |
| Vitigran blue | 1 kg | 39.00 |
| Fungitox | 120 g | 27.50 |
| (iii) Herbicide | | |
| 2,4-D | 1 quant | 29.65 |
| Machete | " | 66.00 |
| **C. Seeds** | | |
| Certified paddy seeds | 1 kg | 2.16 |
| Cabbage seeds | 1 kg | 70 |
| Tomato seed | 1 kg | 35 |
| Maize seed | 1 bag (56 kg) | 90 |
| **D. Agricultural Machinery and Tools** | | |
| Plow-drawn by animal | | |
| Steel | 1 unit | 500 |
| Wood | 1 unit | 200 |
| Hand rotary weeder | 1 unit | 50 |
| Thresher | 1 unit | 500 - 1,000 |
| Hand-tractor | 1 unit | 2,000 - 5,000 |

Source: Field Interview in July, 1980

TABLE-VI.12 TRENDS OF PRICES OF PALAY AND OF CONSUMER'S PRICE INDEX

| Item | Unit | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Palay (Ordinary) | ₱/kg | 0.64 | 0.82 | 0.88 | 0.93 | 1.00 | 0.92 | 0.88 | 0.94 | Bicol |
| 2. Consumer's price index (1972=100) | | 115.9 | 163.5 | 169.5 | 186.1 | 204.3 | 222.9 | 267.4 | - | Bicol |
| 3. Hired labour | ₱/day | 3.00 | 4.00 | 5.00 | 8.00 | - | - | - | 12.00 | Bicol |
| 4. Fertilizer Urea | 50 kg | - | - | 72.00 | - | - | - | - | 96.5 | |

Source: 1) Palay : BEAcon, Daraga

2) Consumer's price index : NCSD, Legaspi

3) Hired labour (1973-76) : BRBDPO

4) Urea 1975 NEDA

1980 Field interview

TABLE-VI.13 RESULTS OF VARIETAL AND FERTILIZER RESPONSE TESTS IN THE BICOL RICE AND CORN EXPERIMENT STATION (1979)

TEST-A:

| Treatment | | | | | Yield (tons/ha) | | |
|---|---|---|---|---|---|---|---|
| N (kg/ha) | | $P_2O_5$ | $K_2O$ (kg/ha) | | | | |
| Basal | Panicle Initiation | (kg/ha) | Basal | Panicle Initiation | IR-8 | IR-36 | IR-42 |
| 0 | 0 | 0 | 0 | 0 | 3.2 | 2.0 | 3.7 |
| 100 | 40 | 0 | 0 | 0 | 5.0 | 4.2 | 4.9 |
| 100 | 40 | 60 | 0 | 0 | 5.9 | 5.2 | 6.2 |
| 100 | 40 | 0 | 60 | 0 | 5.5 | 4.6 | 5.8 |
| 100 | 40 | 60 | 60 | 0 | 7.5 | 6.4 | 7.7 |
| 100 | 40 | 60 | 60 | 30 | 7.7 | 6.5 | 7.9 |

Remark: Dry Season

TEST-B:

| Variety | Growth Duration (days) | Basal N-level(kg/ha) and Yield(ton/ha) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0(kgN/ha) | 60 | 90 | 120 | 150 | 180 |
| IR-9 | 134 | 4.1 | 5.8 | 6.4 | 6.3 | 5.6 | 4.8 |
| IR-20 | 118 | 3.0 | 5.0 | 5.7 | 5.4 | 5.3 | 4.9 |
| IR-32 | 140 | 3.4 | 4.4 | 4.2 | 4.1 | 4.4 | 2.9 |
| IR-36 | 108 | 3.6 | 4.7 | 5.7 | 5.4 | 5.6 | 5.3 |
| IR-38 | 126 | 4.7 | 5.8 | 6.1 | 5.3 | 5.9 | 5.3 |
| IR-42 | 135 | 3.8 | 5.4 | 6.4 | 6.4 | 5.9 | 6.6 |

Remark: Spacing; 20 x 20 cm, 60 kg $P_2O_5$/ha, spacing; 20 x 20 cm, Dry Season, Some plants are affected by Tungro disease, 30 kgN/ha was applied as top-dressing

TEST-C:

| Variety | Growth Duration (days) | Basal N-level(kg/ha) and Yield(tons/ha) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0(kgN/ha) | 30 | 60 | 90 | 120 | 150 |
| IR-8 | 116 | 2.4 | 2.6 | 2.8 | 3.0 | 2.5 | 2.1 |
| IR-20 | 116 | 3.0 | 4.2 | 3.8 | 3.8 | 3.7 | 2.7 |
| IR-36 | 105 | 3.2 | 3.6 | 3.9 | 3.7 | 4.0 | 2.8 |
| IR-42 | 131 | 3.4 | 4.1 | 4.3 | 3.8 | 3.7 | 4.0 |
| IR-44 | 116 | 4.1 | 3.8 | 3.5 | 3.7 | 4.0 | 3.3 |
| IR-46 | 116 | 3.1 | 3.2 | 3.4 | 3.5 | 3.5 | 3.8 |

Remarks: Wet season, 30 kg $P_2O_5$/ha, 30 kg $K_2O$/ha, 20 kgN/ha at panicle initiation stage, Spacing; 20 x 20 cm

TABLE-VI. 14 CORN VARIETY TEST IN THE BICOL RICE AND CORN EXPERIMENT STATION (1979)

A. Dry Season, 1979

| Variety | Yield (tons/ha) |
|---|---|
| DMR-1 | 1.4 |
| DMR-2 | 1.1 |
| Phil. DMR Composit No.2 | 1.5 |
| MIT Var. 2 | 1.5 |
| UPCA Var. 1 | 1.6 |
| UPCA Var. 2 | 1.4 |
| UPCA Var. 3 | 1.3 |
| UPCA Var. 5 | 1.5 |
| BPI-1 | 1.6 |
| BPI-2 | 1.8 |
| BPI-4 | 1.5 |
| Improved Tiniquib | 3.1 |
| Phil. DMRA Composit No.1 | 1.7 |

Remark: Space; 75 x 50 cm
Fertilizer
Basal
120 kgN/ha
60 $kgP_2O_5$/ha
60 $kgK_2O$/ha
Top-dressing
30 kgN/ha
at Knee-high stage

B. Wet Season, 1979

| Variety | Yield (tons/ha) |
|---|---|
| DMR-1 | 0.4 |
| DMR-2 | 0.1 |
| Phil. AMR Composit 2 | 0.3 |
| UPCA Var. 1 | 0.1 |
| UPCA Var. 2 | 0.5 |
| UPCA Var. 3 | 0.2 |
| UPCA Var. 5 | 0.3 |
| BPI-1 | 0.3 |
| BPI-2 | 1.1 |
| BPI-4 | 0.1 |
| Improved Tinigutd | 0.4 |
| Phil. DMR Composit No.1 | 0.8 |

Remark: Space; 75 x 50 cm
Fertilizer
Basal
60 kgN/ha
30 $kgP_2O_5$/ha
30 $kgK_2O$/ha
Top-dressing
30 kgN/ha

## TABLE-VI.15 AVERAGE YIELD OF FERTILIZER FIELD TRIALS

| Treatment (Kg/ha) | | | Yield (tons/ha) | Remark |
|---|---|---|---|---|
| **Dry Season** | | | | |
| N | $P_2O_5$ | $K_2O$ | | |
| 0 | 20 | 20 | 5.0 | |
| 35 | 20 | 20 | 5.2 | Spacing; 20 x 20 cm |
| 70 | 20 | 20 | 5.9 | Variety; IR-36, IR-42 |
| 105 | 20 | 20 | 6.9 | |
| 140 | 20 | 20 | 7.6 | |
| **Wet Season** | | | | |
| N | $P_2O_5$ | $K_2O$ | | |
| 0 | 20 | 20 | 4.0 | |
| 35 | 20 | 20 | 4.7 | Variety; IR-44 |
| 70 | 20 | 20 | 4.9 | IR-46 |
| 105 | 20 | 20 | 5.6 | IR-48 |
| 140 | 20 | 20 | 5.9 | Spacing; 20 x 20 cm |

## TABLE-VI.16 HISTORICAL TREND OF THE LOAN OPERATION OF MASAGANA 99 IN ALBAY PROVINCE

| Item | Unit | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|
| Amount of loan released | $x10^3$peso | 21,312 | 19,467 | 9,529 | 4,558 | 16,149 | 14,687 |
| Farmers loaned | person | 25,038 | 14,883 | 5,014 | 3,701 | 7,105 | 5,643 |
| Harvested area with credit | ha | 22,967 | 13,522 | 5,649 | 3,898 | 12,883 | - |

TABLE-VII.1 INVENTORY OF EXISTING NATIONAL IRRIGATION SYSTEMS

(AS OF FEBRUARY 1980)

| Name of System | Municipalities Covered | Irrigation Area (ha) | Irrigated Area (1979) Wet | Irrigated Area (1979) Dry | Type of Diversion | Sources of Water Supply | Water Right (l/sec) | Location No. |
|---|---|---|---|---|---|---|---|---|
| Mahaba | Ligao | 516 | 470 | 470 | | Mahaba River | | - |
| | | | | | D | No.1 Dam | 300 | |
| | | | | | - do - | No.2 Dam | 200 | |
| | | | | | - do - | No.3 Dam | 400 | |
| Nasisi | - do - | 960 | 958 | 958 | - do - | Nasisi River | 1,400 | - |
| Ogsong | - do - | 400 | - | - | - do - | Ogsong River | 600 | - |
| Hibiga | - do - | 530 | 524 | 524 | | Hibiga River | | - |
| | | | | | - do - | Hibiga Dam | 350 | |
| | | | | | - do - | Gordo Dam | 120 | |
| | | | | | - do - | Magoasili Dam | 100 | |
| | | | | | - do - | Tatacla Dam | 150 | |
| Total | | 2,406 | 1,952 | 1,952 | | | | |

NOTE: WBD - Washable Boulder Dam
SCD - Semi Concrete Dam
D - Concrete Dam
TBD - Temporary Brush Dam
ED - Earth Dam

TABLE-VII.2 INVENTORY OF EXISTING COMMUNAL IRRIGATION SYSTEMS (1/4)

(AS OF FEBRUARY 1980)

| Name of System | Municipalities Covered | Irrigation Area (ha) | Irrigated Area (1979) Wet | Irrigated Area (1979) Dry | Type of Diversion | Sources of Water Supply | Water Right (l/sec) | Location No. |
|---|---|---|---|---|---|---|---|---|
| Tanawan | Malinao | 524 | 274 | 274 | D | Lagbanog Spring | | 1 |
| Matalipni | -do- | 69 | 69 | 69 | -do- | Matalipni Spring | 104 | 2 |
| Upper Estancia | -do- | 37 | 37 | 37 | TBD & WBD | Estancia Creek | 56 | 3 |
| Estancia-Labnig | -do- | 527 | 527 | 527 | -do- | -do- | 792 | 4 |
| Tuliw-Pawa | -do- | 385 | 92 | 92 | D | Tuliw River | 578 | 5 |
| (Subtotal) | | (1,542) | (999) | (999) | | | | |
| Bantagan | Tabaco | 44 | 44 | 44 | WBD | Bantagan Creek | 66 | 6 |
| San Antonio | -do- | 172 | 35 | 35 | D | Boring river | 192 | 7 |
| San Vicente | -do- | 245 | 245 | 180 | TBD & WBD | San Vicante | 368 | 8 |
| Lower San Antonio | -do- | 153 | 153 | 153 | -do- | Lower Bañadere River | 141 | 9 |
| San Carlos-Matagbac | -do- | 75 | 75 | 75 | -do- | San Carlos & Matagbac R. | 113 | 10 |
| Pawa-Tabaco | -do- | 68 | 68 | 68 | D | Bon-on River | 102 | 11 |
| Mariroc | -do- | 200 | 120 | 120 | D & TBD | Mariroc River | 300 | 12 |
| Comun-Vson | -do- | 97 | 97 | 97 | TBD & WBD | Pamungsugan River | 146 | 13 |
| Guinobat-Panal | -do- | 32 | 20 | 20 | -do- | Bon bon & Mariroc R. | 48 | 14 |
| Bongabong | -do- | 147 | 147 | 147 | -do- | Bongabong River | 221 | 15 |
| Tagas | -do- | 33 | 33 | 33 | TBD | Tagas River | 50 | 16 |
| San Ramon | -do- | 21 | 21 | 21 | -do- | San Ramon River | 32 | 17 |
| San Lorenzo | -do- | 30 | 20 | 20 | ED | San Lorenzo River | 45 | 18 |
| (Subtotal) | | (1,317) | (1,078) | (1,013) | | | | |

TABLE-VII.3 INVENTORY OF EXISTING COMMUNAL IRRIGATION SYSTEMS (2/4)

(AS OF FEBRUARY 1980)

| Name of System | Municipalities Covered | Irrigation Area (ha) | Irrigated Area (1979) Wet | Irrigated Area (1979) Dry | Type of Diversion | Sources of Water Supply | Water Right (l/sec) | Location No. |
|---|---|---|---|---|---|---|---|---|
| San Isidro (Iraya) | Malilipot | 50 | 50 | 50 | WBD | San Insidro River | 75 | 19 |
| San Isidro (Ilawod) | -do- | 10 | 10 | 10 | TBD | San Insidro Spring | 15 | 20 |
| Tugawi | -do- | 30 | 30 | 30 | D | Tugawi River | 45 | 21 |
| Upper Tugawi | -do- | 4 | 4 | 4 | TBD | Tugawi River | 6 | 22 |
| Sta.Cruz-Tugawi | -do- | 68 | 68 | 68 | TBD & WBD | Tiagao River | 102 | 23 |
| Sta.Teresa | -do- | 95 | 0 | 0 | D | Sta. Teresa River | 143 | 24 |
| San Jose | -do- | 5 | 5 | 5 | WBD | San Jose River | 8 | 25 |
| Malilipot Poblacion | -do- | 15 | 11 | 11 | TBD | Nawang River | 23 | 26 |
| (Subtotal) | | (277) | (178) | (178) | | | | |
| Bonga | Bacacay | 96 | 96 | 22 | TBD & WBD | Ponorayon & Malinao R. | 144 | 27 |
| Sogod | -do- | 7 | 7 | 7 | TBD | Sogod Creek | 11 | 28 |
| Gubat-Hindi | -do- | 112 | 112 | 112 | -do- | Gogon River | 168 | 29 |
| Gogon | -do- | 200 | 80 | 80 | -do- | -do- | 300 | 30 |
| Bayandong | -do- | 22 | 7 | 7 | -do- | Baclayan River | 33 | 31 |
| Basud | -do- | 22 | 22 | 22 | -do- | Manaet River | 33 | 32 |
| (Subtotal) | | (459) | (324) | (250) | | | | |
| San Fernando-San Andres | Sto. Domingo | 312 | 312 | 312 | -do- | San Fermando River | 468 | 33 |
| San Antonio-Calayucay | -do- | 14 | 14 | 14 | -do- | Calayucay Creek | 22 | 34 |
| Lidog-Padang | -do- | 160 | 160 | 160 | -do- | Lidong Creek | 198 | 35 |
| (Subtotal) | | (486) | (486) | (486) | | | | |

TABLE-VII.4 INVENTORY OF EXISTING COMMUNAL IRRIGATION SYSTEMS (3/4)

(AS OF FEBRUARY 1980)

| Name of System | Municipalities Covered | Irrigation Area (ha) | Irrigated Area (1979) Wet | Irrigated Area (1979) Dry | Type of Diversion | Sources of Water Supply | Water Right (l/sec) | Location No. |
|---|---|---|---|---|---|---|---|---|
| Pawa-Rawis | Legazpi | 122 | 122 | 122 | SCD | Pawa River | 219 | 36 |
| (Subtotal) | | (122) | (122) | (122) | | | | |
| Malabog | Daraga | 180 | 180 | 180 | TBD | Malabog River | 270 | 37 |
| Cullat | -do- | 86 | 86 | 86 | -do- | Yawa River | 129 | 38 |
| (Subtotal) | | (266) | (266) | (266) | | | | |
| Quirangay | Camlig | 185 | 185 | 185 | TBD | Quiraugay River | 278 | 39 |
| Libod-Bariw | -do- | 92 | 92 | 92 | D | Libod River | 138 | 40 |
| Tumpa-Sua | -do- | 365 | 250 | 250 | TBD | Tumpa-Sua River | 375 | 41 |
| (Subtotal) | | (642) | (527) | (527) | | | | |
| Tandarura-Maninila | Guinobatan | 281 | 280 | 272 | -do- | Quiquibang River | - | 42 |
| Ominipus-Haquiron | -do- | 118 | 118 | 118 | WBD | Maquiron Creek | - | 43 |
| Masarawag(Lower) | -do- | 84 | 84 | 84 | TBD | Masarawog River | - | 44 |
| Doña Tomasa | -do- | 90 | 90 | 90 | -do- | Bubulusam River | 135 | 45 |
| Mulod bucad (Pequeño) | -do- | 120 | 120 | 120 | -do- | Muladbucad River | 180 | 46 |
| Mulad bucad (Grande) | -do- | 125 | 125 | 125 | -do- | Pangd River | 188 | 47 |
| Bubulusan | -do- | 29 | 29 | 27 | -do- | Bubulusan River | 44 | 48 |
| (Subtotal) | | (847) | (846) | (836) | | | | |
| Cabilogan | Ligao | 480 | 450 | 450 | TBD | Cabilogan River | 675 | 49 |
| (Subtotal) | | (480) | (450) | (450) | | | | |

TABLE-VII.5 INVENTORY OF EXISTING COMMUNAL IRRIGATION SYSTEMS (4/4)

(AS OF FEBRUARY 1980)

| Name of System | Municipalities Covered | Irrigation Area (ha) | Irrigated Area (1979) Wet | Irrigated Area (1979) Dry | Type of Diversion | Sources of Water Supply | Water Right (l/sec) | Location No. |
|---|---|---|---|---|---|---|---|---|
| Mayac-Benipayo | Oas | 282 | 280 | 275 | TBD | Quinali River | 423 | 50 |
| San-Isidro (Lower) | -do- | 94 | 94 | 94 | D | Pongpong River | 141 | 51 |
| South Quinali | -do- | 1,174 | 550 | 550 | -do- | Quinali River | 1,761 | 52 |
| (Subtotal) | | (1,550) | (924) | (919) | | | | |
| Salog-Calpe | Polangui | 95 | 95 | 95 | WBD | Salog River | 143 | 53 |
| Cabangan | -do- | 118 | 92 | 92 | TBD | San Francisco-Basud | 138 | 54 |
| San Francisco (Gabon) | -do- | 280 | 150 | 150 | D | San Francisco River | - | 55 |
| Agos-Sta. Cruz | -do- | 400 | 250 | 400 | -do- | Quinali River | 600 | 56 |
| Quinali (Right) | -do- | 313 | 207 | 204 | -do- | -do- | 311 | 57 |
| Quinali (Left) | -do- | 90 | 90 | 74 | -do- | -do- | 135 | 58 |
| Bukayna Kudos | -do- | 100 | 100 | 100 | -do- | San Francisco River | 150 | 59 |
| (Subtotal) | | (1,396) | (984) | (1,115) | | | | |
| San Miguel | Libon | 75 | 75 | 75 | TBD | Balagon Creek | 113 | 60 |
| Velasco | -do- | 170 | 170 | 170 | -do- | Hologan River | 255 | 61 |
| Danao | -do- | 347 | 300 | 300 | -do- | Quinali River | 521 | 62 |
| Nagpo | -do- | 165 | 160 | 160 | -do- | Nagpo River | 248 | 63 |
| Macabugos | -do- | 18 | - | - | - | - | - | 64 |
| San Agustin | -do- | 430 | 430 | 405 | D | Quinali River | 656 | 65 |
| (Subtotal) | | (1,212) | (1,135) | (1,110) | | | | |
| Total | | 10,596 | 8,319 | 8,271 | | | | |

## TABLE-VII.6 POTENTIAL EVAPOTRANSPIRATION

| | Quinali (A) | | Quinali (B) | |
|---|---|---|---|---|
| | Monthly PET (mm/month) | Daily PET (mm/day) | Monthly PET (mm/month) | Daily PET (mm/day) |
| Jan. | 127 | 4.1 | 81 | 2.6 |
| Feb. | 123 | 4.4 | 87 | 3.1 |
| Mar. | 158 | 5.1 | 124 | 4.0 |
| Apr. | 177 | 5.9 | 138 | 4.6 |
| May | 167 | 5.4 | 146 | 4.7 |
| June | 147 | 4.9 | 123 | 4.1 |
| July | 167 | 5.4 | 136 | 4.4 |
| Aug. | 149 | 4.8 | 115 | 3.7 |
| Sep. | 141 | 4.7 | 108 | 3.6 |
| Oct. | 127 | 4.1 | 112 | 3.6 |
| Nov. | 105 | 3.5 | 84 | 2.8 |
| Dec. | 121 | 3.9 | 74 | 2.4 |
| Total | 1,709 | 4.7 | 1,328 | 3.6 |

## TABLE-VII.7 CROP GROWTH-STAGE COEFFICIENT

| Days after transplanting | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 |
|---|---|---|---|---|---|---|---|---|---|---|
| KC | 0.80 | 0.90 | 0.95 | 1.05 | 1.10 | 1.10 | 1.05 | 1.00 | 0.95 | 0.90 |

Source: FAO/UNDP, Soil and Land Resources Appraisal and Training Project, 1976

TABLE-VII.8 CALCULATION OF CROP WATER REQUIREMENT (1/3)

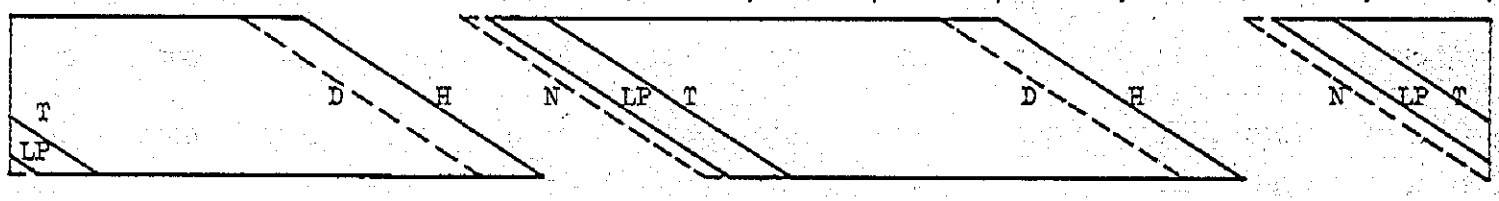
Quinali (A) River Basin, Lower Area

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cropping Pattern | T, LP | | D | H | N, LP | T | | | D | H | N, LP | T |
| Potential Evapotransdiration PET | 127 | 123 | 158 | 177 | 167 | 147 | 167 | 149 | 141 | 127 | 105 | 121 |
| Crop Coefficient KC | 0.99 | 1.03 | 0.98 | 0.92 | 0.83 | 0.92 | 1.02 | 1.02 | 0.95 | 0.90 | 0.80 | 0.89 |
| PET x KC | 126 | 127 | 155 | 163 | 139 | 135 | 170 | 152 | 134 | 114 | 84 | 108 |
| Percolation Rate (2 mm/d) P | 62 | 56 | 62 | 60 | 62 | 60 | 62 | 62 | 60 | 62 | 60 | 62 |
| Cropping Intensity CI | 0.89 | 0.99 | 0.67 | 0.17 | 0.11 | 0.58 | 0.97 | 0.94 | 0.50 | 0.06 | 0.03 | 0.42 |
| Field Crop Requirement FC | 167 | 181 | 145 | 38 | 22 | 113 | 225 | 201 | 97 | 11 | 4 | 71 |
| Nursery Requirement N | 11 | - | - | 1 | 6 | 6 | 1 | - | - | - | 2 | 6 |
| Land Preparation Requirement LP | 45 | - | - | 5 | 106 | 112 | 14 | - | - | - | 65 | 111 |
| Crop Water Requirement CWR | 223 | 181 | 145 | 44 | 134 | 231 | 240 | 201 | 97 | 11 | 71 | 188 |

Note: FC = (PET x KC + P) x CI, CWR = FC + N + LP
T = Transplanting, D = Drainage, H = Harvest

TABLE-VII.9 CALCULATION OF CROP WATER REQUIREMENT (2/3)

Quinali (A) River Basin, Upper Area




| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Potential Evapotransdiration PET | 127 | 123 | 158 | 177 | 167 | 147 | 167 | 149 | 141 | 127 | 105 | 121 |
| Crop Coefficient KC | 0.99 | 1.03 | 0.98 | 0.92 | 0.83 | 0.92 | 1.02 | 1.02 | 0.95 | 0.90 | 0.80 | 0.89 |
| PET x KC | 126 | 127 | 155 | 163 | 139 | 135 | 170 | 152 | 134 | 114 | 84 | 108 |
| Percolation Rate (4 mm/d) P | 124 | 112 | 124 | 120 | 124 | 120 | 124 | 124 | 120 | 124 | 120 | 124 |
| Cropping Intensity CI | 0.89 | 0.99 | 0.67 | 0.17 | 0.11 | 0.58 | 0.97 | 0.94 | 0.50 | 0.06 | 0.03 | 0.42 |
| Field Crop Requirement FC | 223 | 237 | 187 | 48 | 29 | 148 | 285 | 259 | 127 | 14 | 6 | 97 |
| Nursery Requirement N | 12 | - | - | 1 | 7 | 6 | 1 | - | - | - | 2 | 7 |
| Land Preparation Requirement LP | 51 | - | - | 6 | 119 | 127 | 16 | - | - | - | 74 | 126 |
| Crop Water Requirement CWR | 286 | 237 | 187 | 55 | 155 | 281 | 302 | 259 | 127 | 14 | 82 | 230 |

Note: FC = (PET x KC + P) x CI, CWR = FC + N + LP
T = Transplanting, D = Drainage, H = Harvest

TABLE-VII.10 CALCULATION OF CROP WATER REQUIREMENT (3/3)

Quinali (B) River Basin

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cropping Pattern | | | | | | | | | | | | |
| Potential Evapotransdiration PET | 81 | 87 | 124 | 138 | 146 | 123 | 136 | 115 | 108 | 112 | 84 | 74 |
| Crop Coefficient KC | 0.99 | 1.03 | 0.98 | 0.92 | 0.83 | 0.92 | 1.02 | 1.02 | 0.95 | 0.90 | 0.80 | 0.89 |
| PET x KC | 80 | 90 | 122 | 127 | 121 | 113 | 139 | 117 | 103 | 101 | 67 | 66 |
| Percolation Rate (4 mm/d) P | 124 | 112 | 124 | 120 | 124 | 120 | 124 | 124 | 120 | 124 | 120 | 124 |
| Cropping Intensity CI | 0.89 | 0.99 | 0.67 | 0.17 | 0.11 | 0.58 | 0.97 | 0.94 | 0.50 | 0.06 | 0.03 | 0.42 |
| Field Crop Requirement FC | 182 | 200 | 165 | 42 | 27 | 135 | 255 | 227 | 112 | 14 | 6 | 80 |
| Nursery Requirement N | 11 | - | - | 1 | 6 | 6 | 1 | - | - | - | 2 | 7 |
| Land Preparation Requirement LP | 47 | - | - | 5 | 115 | 122 | 15 | - | - | - | 72 | 117 |
| Crop Water Requirement CWR | 240 | 200 | 165 | 49 | 148 | 263 | 271 | 227 | 112 | 14 | 80 | 204 |

Note: FC = (PET x KC + P) x CI, CWR = FC + N + LP
T = Transplanting, D = Drainage, H = Harvest

TABLE-VII.11 MONTHLY EFFECTIVE RAINFALL AT LIBON RAINFALL GAUGING STATION

(Quinali(A)River Basin)

(Unit: mm)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 76 | 120 | 104 | 54 | 128 | 102 | 240 | 150 | 225 | 104 | 220 | 290 | 1,813 |
| 57 | 160 | 46 | 59 | 140 | 20 | 155 | 177 | 218 | 168 | 178 | 175 | 74 | 1,570 |
| 58 | 115 | 69 | 70 | 16 | 88 | 132 | 158 | 175 | 197 | 290 | 180 | 50 | 1,540 |
| 59 | 87 | 73 | 130 | 26 | 155 | 87 | 186 | 170 | 162 | 202 | 242 | 265 | 1,785 |
| 1960 | 105 | 65 | 56 | 54 | 110 | 148 | 182 | 170 | 180 | 180 | 188 | 190 | 1,628 |
| 61 | 12 | 0 | 47 | 24 | 150 | 142 | 200 | 165 | 132 | 195 | 121 | 84 | 1,272 |
| 62 | 88 | 66 | 78 | 30 | 202 | 205 | 222 | 163 | 203 | 68 | 198 | 58 | 1,581 |
| 63 | 10 | 42 | 8 | 11 | 87 | 210 | 110 | 265 | 161 | 132 | 124 | 128 | 1,288 |
| 64 | 120 | 50 | 43 | 114 | 38 | 162 | 92 | 120 | 167 | 148 | 172 | 230 | 1,456 |
| 1965 | 74 | 32 | 17 | 33 | 46 | 104 | 148 | 55 | 82 | 59 | 67 | 81 | 798 |
| 66 | 172 | 29 | 57 | 23 | 112 | 112 | 198 | 95 | 127 | 170 | 213 | 262 | 1,570 |
| 67 | 231 | 74 | 77 | 59 | 35 | 81 | 194 | 184 | 230 | 120 | 60 | 47 | 1,392 |
| 68 | 69 | 57 | 19 | 8 | 110 | 150 | 182 | 170 | 180 | 252 | 187 | 225 | 1,609 |
| 69 | 105 | 74 | 6 | 12 | 53 | 150 | 197 | 125 | 192 | 62 | 124 | 204 | 1,304 |
| 1970 | 148 | 130 | 64 | 50 | 33 | 82 | 250 | 215 | 171 | 208 | 255 | 150 | 1,756 |
| 71 | 157 | 65 | 120 | 56 | 238 | 145 | 230 | 87 | 100 | 223 | 106 | 265 | 1,792 |
| 72 | 23 | 66 | 120 | 22 | 77 | 185 | 232 | 249 | 178 | 140 | 175 | 122 | 1,589 |
| 73 | 26 | 19 | 24 | 11 | 33 | 82 | 145 | 155 | 205 | 384 | 241 | 262 | 1,587 |
| 74 | 57 | 102 | 30 | 31 | 74 | 256 | 254 | 78 | 43 | 207 | 212 | 210 | 1,554 |
| 1975 | 140 | 46 | 91 | 147 | 29 | 190 | 185 | 194 | 222 | 157 | 298 | 59 | 1,758 |
| 76 | 142 | 136 | 74 | 48 | 221 | 249 | 37 | 231 | 186 | 127 | 269 | 265 | 1,985 |
| 77 | 100 | 103 | 37 | 23 | 118 | 28 | 260 | 153 | 205 | 73 | 188 | 38 | 1,326 |
| 78 | 19 | 9 | 69 | 90 | 112 | 171 | 158 | 181 | 145 | 205 | 49 | 137 | 1,345 |
| 79 | 19 | 7 | 8 | 170 | 58 | 162 | 178 | 105 | 273 | 88 | 153 | 107 | 1,328 |
| Average | 94 | 62 | 59 | 52 | 97 | 145 | 184 | 161 | 172 | 166 | 176 | 158 | 1,526 |

Note: Rainfall records from 1956 to 1971 and from 1978 to 1979 in the above table were processed by using rainfall records observed at Guinobatan Rainfall Gauging Station.

TABLE-VII.12 MONTHLY EFFECTIVE RAINFALL AT MALINAO RAINFALL GAUGING STATION
(Quinali(B)River Basin)

(Unit: mm)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 262 | 240 | 265 | 296 | 253 | 115 | 173 | 215 | 282 | 251 | 277 | 300 | 2,929 |
| 57 | 274 | 128 | 193 | 181 | 137 | 152 | 159 | 210 | 190 | 266 | 282 | 235 | 2,407 |
| 58 | 270 | 241 | 245 | 125 | 211 | 145 | 186 | 258 | 180 | 299 | 292 | 215 | 2,667 |
| 59 | 249 | 243 | 242 | 82 | 207 | 155 | 204 | 130 | 150 | 199 | 290 | 295 | 2,446 |
| 1960 | 154 | 166 | 105 | 225 | 241 | 162 | 107 | 177 | 255 | 275 | 293 | 261 | 2,421 |
| 61 | 156 | 76 | 146 | 212 | 151 | 175 | 107 | 205 | 157 | 257 | 260 | 249 | 2,151 |
| 62 | 237 | 195 | 155 | 133 | 247 | 78 | 201 | 217 | 265 | 141 | 276 | 212 | 2,357 |
| 63 | 205 | 254 | 84 | 83 | 160 | 227 | 174 | 285 | 168 | 180 | 278 | 265 | 2,363 |
| 64 | 268 | 221 | 113 | 295 | 155 | 155 | 124 | 166 | 280 | 220 | 272 | 295 | 2,564 |
| 1965 | 277 | 215 | 233 | 146 | 200 | 160 | 263 | 228 | 172 | 277 | 272 | 285 | 2,728 |
| 66 | 281 | 154 | 182 | 137 | 152 | 69 | 263 | 104 | 140 | 263 | 277 | 299 | 2,321 |
| 67 | 287 | 205 | 243 | 183 | 67 | 105 | 35 | 206 | 152 | 182 | 294 | 252 | 2,311 |
| 68 | 262 | 160 | 151 | 86 | 19 | 57 | 203 | 193 | 217 | 155 | 253 | 171 | 1,927 |
| 69 | 72 | 56 | 100 | 167 | 95 | 103 | 175 | 157 | 213 | 130 | 267 | 293 | 1,828 |
| 1970 | 243 | 237 | 236 | 218 | 92 | 182 | 188 | 176 | 206 | 293 | 298 | 278 | 2,647 |
| 71 | 271 | 275 | 258 | 179 | 270 | 201 | 272 | 120 | 131 | 286 | 274 | 300 | 2,837 |
| 72 | 298 | 147 | 269 | 124 | 97 | 225 | 176 | 260 | 143 | 180 | 279 | 268 | 2,466 |
| 73 | 227 | 161 | 93 | 142 | 141 | 198 | 271 | 251 | 241 | 295 | 295 | 300 | 2,615 |
| 74 | 234 | 250 | 137 | 113 | 131 | 251 | 218 | 125 | 195 | 283 | 270 | 281 | 2,488 |
| 1975 | 258 | 215 | 58 | 280 | 121 | 208 | 239 | 200 | 263 | 205 | 232 | 300 | 2,579 |
| 76 | 130 | 208 | 246 | 218 | 251 | 237 | 211 | 224 | 158 | 238 | 279 | 300 | 2,700 |
| 77 | 232 | 243 | 161 | 188 | 238 | 157 | 257 | 195 | 236 | 195 | 299 | 200 | 2,601 |
| 78 | 128 | 178 | 204 | 177 | 208 | 258 | 214 | 238 | 265 | 268 | 260 | 278 | 2,676 |
| 79 | 175 | 145 | 34 | 215 | 163 | 225 | 201 | 135 | 241 | 238 | 277 | 245 | 2,294 |
| Average | 227 | 192 | 173 | 175 | 167 | 167 | 197 | 195 | 204 | 232 | 277 | 266 | 2,472 |

Note: Rainfall records from 1956 to 1971 in the above table were processed by using rainfall records observed at Sto. Domingo Rainfall Gauging Station.

TABLE-VII.13 UNIT IRRIGATION DIVERSION REQUIREMENT (1/3)

Quinali (A) River Basin, Lower Area (Unit: l/sec/ha)

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | Average | Max. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 0.94 | 0.42 | 0.46 | 0.22 | 0.57 | 0.94 | 0 | 0.37 | 0 | 0.03 | 0.23 | 0 | 0.35 | 0.94 |
| 57 | 0.45 | 0.93 | 0.65 | 0.12 | 0.79 | 0.66 | 0.39 | 0 | 0.08 | 0 | 0.28 | 0.87 | 0.44 | 0.93 |
| 58 | 0.72 | 0.77 | 0.60 | 0.26 | 0.65 | 0.78 | 0.51 | 0.22 | 0 | 0 | 0.27 | 0.96 | 0.48 | 0.96 |
| 59 | 0.88 | 0.75 | 0.35 | 0.25 | 0.52 | 1.02 | 0.34 | 0.25 | 0.10 | 0 | 0.21 | 0.08 | 0.40 | 1.02 |
| 1960 | 0.77 | 0.80 | 0.66 | 0.22 | 0.61 | 0.70 | 0.36 | 0.25 | 0.05 | 0 | 0.27 | 0.39 | 0.42 | 0.80 |
| 61 | 1.32 | 1.25 | 0.70 | 0.26 | 0.53 | 0.73 | 0.25 | 0.28 | 0.20 | 0 | 0.33 | 0.82 | 0.56 | 1.32 |
| 62 | 0.87 | 0.79 | 0.57 | 0.25 | 0.42 | 0.40 | 0.11 | 0.29 | 0 | 0.04 | 0.26 | 0.93 | 0.41 | 0.83 |
| 63 | 1.33 | 0.96 | 0.87 | 0.27 | 0.66 | 0.37 | 0.81 | 0 | 0.11 | 0.02 | 0.33 | 0.65 | 0.53 | 1.33 |
| 64 | 0.69 | 0.90 | 0.72 | 0.15 | 0.76 | 0.62 | 0.92 | 0.55 | 0.09 | 0.01 | 0.28 | 0.23 | 0.49 | 0.92 |
| 1965 | 0.96 | 1.03 | 0.83 | 0.24 | 0.74 | 0.93 | 0.57 | 0.93 | 0.36 | 0.05 | 0.39 | 0.84 | 0.66 | 1.03 |
| 66 | 0.38 | 1.05 | 0.66 | 0.26 | 0.60 | 0.89 | 0.26 | 0.69 | 0.22 | 0 | 0.24 | 0.10 | 0.45 | 1.05 |
| 67 | 0.04 | 0.74 | 0.57 | 0.21 | 0.76 | 1.05 | 0.29 | 0.17 | 0 | 0.02 | 0.40 | 0.98 | 0.44 | 1.05 |
| 68 | 0.99 | 0.86 | 0.82 | 0.27 | 0.61 | 0.69 | 0.36 | 0.25 | 0.05 | 0 | 0.27 | 0.25 | 0.45 | 0.99 |
| 69 | 0.77 | 0.74 | 0.88 | 0.27 | 0.73 | 0.69 | 0.27 | 0.52 | 0 | 0.04 | 0.33 | 0.33 | 0.46 | 0.88 |
| 1970 | 0.52 | 0.35 | 0.63 | 0.23 | 0.77 | 1.05 | 0 | 0 | 0.07 | 0 | 0.20 | 0.56 | 0.37 | 1.05 |
| 71 | 0.47 | 0.80 | 0.39 | 0.22 | 0.35 | 0.71 | 0.06 | 0.74 | 0.30 | 0 | 0.35 | 0.08 | 0.37 | 0.80 |
| 72 | 1.25 | 0.79 | 0.39 | 0.26 | 0.68 | 0.50 | 0.05 | 0 | 0.05 | 0.01 | 0.30 | 0.67 | 0.41 | 1.25 |
| 73 | 1.24 | 1.12 | 0.80 | 0.27 | 0.77 | 1.05 | 0.59 | 0.34 | 0 | 0 | 0.21 | 0.10 | 0.54 | 1.24 |
| 74 | 1.05 | 0.55 | 0.77 | 0.25 | 0.68 | 0.12 | 0 | 0.79 | 0.49 | 0 | 0.24 | 0.31 | 0.44 | 1.05 |
| 1975 | 0.57 | 0.93 | 0.51 | 0.11 | 0.77 | 0.48 | 0.34 | 0.11 | 0 | 0 | 0.16 | 0.93 | 0.41 | 0.93 |
| 76 | 0.56 | 0.31 | 0.59 | 0.23 | 0.38 | 0.16 | 1.26 | 0 | 0.03 | 0.02 | 0.19 | 0.08 | 0.32 | 1.26 |
| 77 | 0.80 | 0.54 | 0.74 | 0.26 | 0.59 | 1.34 | 0 | 0.35 | 0 | 0.04 | 0.27 | 1.01 | 0.50 | 1.01 |
| 78 | 1.28 | 1.18 | 0.61 | 0.18 | 0.60 | 0.58 | 0.51 | 0.19 | 0.16 | 0 | 0.41 | 0.61 | 0.53 | 1.28 |
| 79 | 1.28 | 1.20 | 0.87 | 0.09 | 0.71 | 0.62 | 0.39 | 0.63 | 0 | 0.03 | 0.30 | 0.73 | 0.57 | 1.28 |
| Average | 0.84 | 0.82 | 0.65 | 0.22 | 0.64 | 0.71 | 0.36 | 0.33 | 0.1 | 0.01 | 0.28 | 0.52 | 0.48 | |

TABLE-VII.14 UNIT IRRIGATION DIVERSION REQUIREMENT (2/3)

Quinali (A) River Basin, Upper Area (Unit: l/sec/ha)

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | Average | Max. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 1.34 | 0.81 | 0.72 | 0.29 | 0.70 | 1.27 | 0.38 | 0.73 | 0.09 | 0.05 | 0.30 | 0.24 | 0.58 | 1.34 |
| 57 | 0.85 | 1.32 | 0.91 | 0.19 | 0.94 | 0.98 | 0.78 | 0.33 | 0.28 | 0.02 | 0.35 | 1.13 | 0.67 | 1.32 |
| 58 | 1.11 | 1.16 | 0.87 | 0.34 | 0.78 | 1.10 | 0.90 | 0.58 | 0.19 | 0 | 0.35 | 1.22 | 0.72 | 1.22 |
| 59 | 1.27 | 1.13 | 0.61 | 0.32 | 0.65 | 1.34 | 0.72 | 0.61 | 0.30 | 0 | 0.28 | 0.34 | 0.63 | 1.34 |
| 1960 | 1.17 | 1.19 | 0.93 | 0.29 | 0.74 | 1.02 | 0.75 | 0.61 | 0.24 | 0.02 | 0.34 | 0.65 | 0.66 | 1.19 |
| 61 | 1.71 | 1.63 | 0.96 | 0.32 | 0.66 | 1.05 | 0.63 | 0.64 | 0.39 | 0.01 | 0.41 | 1.09 | 0.79 | 1.71 |
| 62 | 1.27 | 1.18 | 0.83 | 0.32 | 0.55 | 0.72 | 0.50 | 0.65 | 0.17 | 0.06 | 0.33 | 1.19 | 0.65 | 1.27 |
| 63 | 1.72 | 1.34 | 1.13 | 0.34 | 0.79 | 0.69 | 1.19 | 0.06 | 0.30 | 0.04 | 0.40 | 0.91 | 0.74 | 1.72 |
| 64 | 1.08 | 1.29 | 0.98 | 0.22 | 0.88 | 0.95 | 1.31 | 0.91 | 0.28 | 0.03 | 0.35 | 0.49 | 0.73 | 1.31 |
| 1965 | 1.35 | 1.41 | 1.09 | 0.32 | 0.87 | 1.25 | 0.96 | 1.29 | 0.55 | 0.06 | 0.46 | 1.10 | 0.89 | 1.41 |
| 66 | 0.78 | 1.43 | 0.92 | 0.33 | 0.74 | 1.21 | 0.65 | 1.05 | 0.41 | 0.02 | 0.31 | 0.36 | 0.68 | 1.43 |
| 67 | 0.43 | 1.12 | 0.84 | 0.29 | 0.89 | 1.38 | 0.67 | 0.53 | 0.08 | 0.04 | 0.47 | 1.24 | 0.67 | 1.38 |
| 68 | 1.38 | 1.24 | 1.08 | 0.34 | 0.74 | 1.01 | 0.75 | 0.61 | 0.24 | 0 | 0.34 | 0.51 | 0.69 | 1.38 |
| 69 | 1.17 | 1.12 | 1.14 | 0.34 | 0.85 | 1.01 | 0.65 | 0.88 | 0.20 | 0.06 | 0.40 | 0.60 | 0.70 | 1.17 |
| 1970 | 0.91 | 0.74 | 0.89 | 0.3 | 0.90 | 1.37 | 0.32 | 0.35 | 0.27 | 0 | 0.27 | 0.82 | 0.60 | 1.37 |
| 71 | 0.86 | 1.19 | 0.65 | 0.29 | 0.48 | 1.03 | 0.45 | 1.10 | 0.49 | 0 | 0.42 | 0.35 | 0.61 | 1.19 |
| 72 | 1.65 | 1.18 | 0.65 | 0.33 | 0.81 | 0.82 | 0.44 | 0.15 | 0.24 | 0.03 | 0.35 | 0.93 | 0.63 | 1.65 |
| 73 | 1.63 | 1.50 | 1.06 | 0.34 | 0.90 | 1.37 | 0.98 | 0.70 | 0.16 | 0 | 0.29 | 0.36 | 0.77 | 1.63 |
| 74 | 1.45 | 0.93 | 1.03 | 0.32 | 0.81 | 1.22 | 0.30 | 1.15 | 0.68 | 0 | 0.31 | 0.57 | 0.73 | 1.45 |
| 1975 | 0.96 | 1.32 | 0.78 | 0.19 | 0.90 | 0.79 | 0.73 | 0.47 | 0.10 | 0.03 | 0.23 | 1.19 | 0.64 | 1.32 |
| 76 | 0.95 | 0.70 | 0.85 | 0.30 | 0.51 | 0.48 | 1.65 | 0.25 | 0.22 | 0.04 | 0.25 | 0.35 | 0.55 | 1.65 |
| 77 | 1.19 | 0.93 | 1.00 | 0.33 | 0.72 | 1.66 | 0.26 | 0.71 | 0.16 | 0.06 | 0.34 | 1.28 | 0.72 | 1.66 |
| 78 | 1.67 | 1.57 | 0.87 | 0.25 | 0.74 | 0.90 | 0.90 | 0.55 | 0.35 | 0 | 0.48 | 0.87 | 0.76 | 1.67 |
| 79 | 1.67 | 1.58 | 1.13 | 0.16 | 0.85 | 0.95 | 0.77 | 0.99 | 0 | 0.05 | 0.37 | 0.99 | 0.79 | 1.67 |
| Average | 1.15 | 1.21 | 0.91 | 0.29 | 0.77 | 1.07 | 0.74 | 0.66 | 0.27 | 0.03 | 0.35 | 0.78 | 0.69 | |

TABLE-VII.15 UNIT IRRIGATION DIVERSION REQUIREMENT (3/3)

Quinali (B) Area

(Unit: l/sec/ha)

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | Average | Max. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 0 | 0 | 0 | 0 | 0.40 | 1.08 | 0.61 | 0.15 | 0 | 0 | 0.24 | 0.04 | 0.21 | 1.08 |
| 57 | 0 | 0.50 | 0.20 | 0.11 | 0.64 | 0.88 | 0.70 | 0.18 | 0.11 | 0 | 0.23 | 0.31 | 0.33 | 0.88 |
| 58 | 0 | 0 | 0 | 0.17 | 0.49 | 0.92 | 0.53 | 0 | 0.14 | 0 | 0.22 | 0.39 | 0.24 | 0.92 |
| 59 | 0.04 | 0 | 0 | 0.22 | 0.50 | 0.87 | 0.42 | 0.65 | 0.24 | 0 | 0.22 | 0.06 | 0.27 | 0.87 |
| 1960 | 0.59 | 0.24 | 0.58 | 0.06 | 0.43 | 0.83 | 1.02 | 0.37 | 0 | 0 | 0.22 | 0.20 | 0.39 | 1.02 |
| 61 | 0.58 | 0.86 | 0.41 | 0.07 | 0.61 | 0.76 | 1.02 | 0.21 | 0.22 | 0 | 0.25 | 0.25 | 0.44 | 1.02 |
| 62 | 0.11 | 0.04 | 0.37 | 0.16 | 0.42 | 1.28 | 1.14 | 0.14 | 0 | 0.03 | 0.24 | 0.40 | 0.36 | 1.28 |
| 63 | 0.30 | 0 | 0.67 | 0.22 | 0.59 | 0.48 | 0.60 | 0 | 0.18 | 0.02 | 0.23 | 0.19 | 0.29 | 0.67 |
| 64 | 0 | 0 | 0.54 | 0 | 0.60 | 0.87 | 0.92 | 0.20 | 0 | 0 | 0.24 | 0.06 | 0.29 | 0.92 |
| 1965 | 0 | 0 | 0.04 | 0.15 | 0.51 | 0.84 | 0.05 | 0.07 | 0.17 | 0 | 0.24 | 0.10 | 0.18 | 0.84 |
| 66 | 0 | 0.32 | 0.25 | 0.16 | 0.61 | 1.32 | 0.05 | 0.80 | 0.27 | 0 | 0.24 | 0.04 | 0.34 | 1.32 |
| 67 | 0 | 0 | 0 | 0.10 | 0.78 | 1.13 | 0.85 | 0.20 | 0.23 | 0.02 | 0.22 | 0.24 | 0.31 | 1.13 |
| 68 | 0 | 0.28 | 0.39 | 0.22 | 0.88 | 1.39 | 0.42 | 0.28 | 0.02 | 0.03 | 0.26 | 0.57 | 0.40 | 1.39 |
| 69 | 0.23 | 0.99 | 0.60 | 0.12 | 0.73 | 1.14 | 0.60 | 0.49 | 0.04 | 0.04 | 0.25 | 0.07 | 0.44 | 1.14 |
| 1970 | 0.08 | 0 | 0.02 | 0.06 | 0.73 | 0.72 | 0.52 | 0.38 | 0.06 | 0 | 0.21 | 0.13 | 0.24 | 0.73 |
| 71 | 0 | 0 | 0 | 0.11 | 0.37 | 0.62 | 0 | 0.71 | 0.30 | 0 | 0.24 | 0.04 | 0.20 | 0.71 |
| 72 | 0 | 0.37 | 0 | 0.17 | 0.72 | 0.50 | 0.59 | 0 | 0.26 | 0.02 | 0.23 | 0.17 | 0.25 | 0.72 |
| 73 | 0.17 | 0.27 | 0.63 | 0.15 | 0.63 | 0.64 | 0 | 0 | 0 | 0 | 0.22 | 0.04 | 0.23 | 0.64 |
| 74 | 0.13 | 0 | 0.44 | 0.18 | 0.65 | 0.36 | 0.33 | 0.68 | 0.09 | 0 | 0.24 | 0.12 | 0.27 | 0.68 |
| 1975 | 0 | 0 | 0.78 | 0 | 0.67 | 0.58 | 0.20 | 0.24 | 0 | 0 | 0.28 | 0.04 | 0.23 | 0.78 |
| 76 | 0.74 | 0 | 0 | 0.06 | 0.41 | 0.43 | 0.37 | 0.10 | 0.21 | 0 | 0.23 | 0.04 | 0.22 | 0.74 |
| 77 | 0.14 | 0 | 0.34 | 0.10 | 0.43 | 0.86 | 0.09 | 0.27 | 0 | 0.01 | 0.21 | 0.45 | 0.24 | 0.86 |
| 78 | 0.75 | 0.16 | 0.16 | 0.11 | 0.50 | 0.32 | 0.35 | 0.01 | 0 | 0 | 0.25 | 0.13 | 0.23 | 0.75 |
| 79 | 0.47 | 0.38 | 0.88 | 0.07 | 0.59 | 0.50 | 0.44 | 0.62 | 0 | 0 | 0.24 | 0.27 | 0.37 | 0.88 |
| Average | 0.18 | 0.18 | 0.3 | 0.12 | 0.41 | 0.81 | 0.49 | 0.28 | 0.11 | 0.01 | 0.23 | 0.18 | 0.27 | |

TABLE-VII.16 IRRIGABLE AREA FOR THE NATIONAL IRRIGATION SYSTEM

(Unit: ha)

| | Present | | Future | |
|---|---|---|---|---|
| | Wet S. | Dry S. | Wet S. | Dry S. |
| Ogsong | 300 | 300 | 600 | 600 |
| Nasisi | 1,350 | 1,350 | 900 | 900 |
| Mahaba | | | 700 | 450 |
| Hibiga | 350 | 350 | 500 | 500 |
| Total | 2,050 | 2,050 | 2,700 | 2,450 |

Source: Feasibility Report on the National Irrigation Systems Improvement Project, Package II, 1977

TABLE-VII.17 IRRIGATION DIVERSION REQUIREMENT AT OGSONG HEADWORKS

(Unit: $m^3/sec$)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 0.8 | 0.5 | 0.4 | 0.2 | 0.4 | 0.2 | 0.2 | 0.5 | 0.1 | 0.0 | 0.2 | 0.2 |
| 57 | 0.5 | 0.8 | 0.6 | 0.1 | 0.6 | 0.6 | 0.5 | 0.2 | 0.2 | 0. | 0.2 | 0.7 |
| 58 | 0.7 | 0.7 | 0.5 | 0.2 | 0.5 | 0.7 | 0.6 | 0.4 | 0.1 | 0.0 | 0.2 | 0.7 |
| 59 | 0.8 | 0.7 | 0.4 | 0.2 | 0.4 | 0.8 | 0.4 | 0.4 | 0.2 | 0.0 | 0.2 | 0.2 |
| 1960 | 0.7 | 0.7 | 0.6 | 0.2 | 0.5 | 0.6 | 0.5 | 0.4 | 0.2 | 0.0 | 0.2 | 0.4 |
| 61 | 1.0 | 1.0 | 0.6 | 0.2 | 0.4 | 0.6 | 0.4 | 0.4 | 0.2 | 0.0 | 0.3 | 0.7 |
| 62 | 0.8 | 0.7 | 0.5 | 0.2 | 0.3 | 0.4 | 0.3 | 0.4 | 0.1 | 0.0 | 0.2 | 0.7 |
| 63 | 1.0 | 0.8 | 0.7 | 0.2 | 0.5 | 0.4 | 0.7 | 0.0 | 0.2 | 0.0 | 0.3 | 0.6 |
| 64 | 0.7 | 0.8 | 0.6 | 0.1 | 0.5 | 0.6 | 0.8 | 0.6 | 0.2 | 0.0 | 0.2 | 0.3 |
| 1965 | 0.8 | 0.9 | 0.7 | 0.2 | 0.5 | 0.8 | 0.6 | 0.8 | 0.3 | 0.1 | 0.3 | 0.7 |
| 66 | 0.5 | 0.9 | 0.6 | 0.2 | 0.5 | 0.7 | 0.4 | 0.6 | 0.3 | 0.0 | 0.2 | 0.2 |
| 67 | 0.3 | 0.7 | 0.5 | 0.2 | 0.5 | 0.8 | 0.4 | 0.3 | 0.1 | 0.0 | 0.3 | 0.8 |
| 68 | 0.8 | 0.7 | 0.7 | 0.2 | 0.5 | 0.6 | 0.5 | 0.4 | 0.2 | 0. | 0.2 | 0.3 |
| 69 | 0.7 | 0.7 | 0.7 | 0.2 | 0.5 | 0.6 | 0.4 | 0.5 | 0.1 | 0.1 | 0.3 | 0.4 |
| 1970 | 0.6 | 0.5 | 0.5 | 0.2 | 0.6 | 0.8 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 | 0.5 |
| 71 | 0.5 | 0.7 | 0.4 | 0.2 | 0.3 | 0.6 | 0.3 | 0.7 | 0.3 | 0.0 | 0.3 | 0.2 |
| 72 | 1.0 | 0.7 | 0.4 | 0.2 | 0.5 | 0.5 | 0.3 | 0.1 | 0.2 | 0.0 | 0.2 | 0.6 |
| 73 | 1.0 | 0.9 | 0.6 | 0.2 | 0.6 | 0.8 | 0.6 | 0.4 | 0.1 | 0. | 0.2 | 0.2 |
| 74 | 0.9 | 0.6 | 0.6 | 0.2 | 0.5 | 0.3 | 0.2 | 0.7 | 0.4 | 0.0 | 0.2 | 0.4 |
| 1975 | 0.6 | 0.8 | 0.5 | 0.1 | 0.6 | 0.5 | 0.4 | 0.3 | 0.1 | 0.0 | 0.1 | 0.7 |
| 76 | 0.6 | 0.4 | 0.5 | 0.2 | 0.3 | 0.3 | 1.0 | 0.2 | 0.1 | 0.0 | 0.2 | 0.2 |
| 77 | 0.7 | 0.6 | 0.6 | 0.2 | 0.4 | 1.0 | 0.2 | 0.4 | 0.1 | 0.0 | 0.2 | 0.8 |
| 78 | 1.0 | 1.0 | 0.5 | 0.2 | 0.5 | 0.6 | 0.6 | 0.3 | 0.2 | 0.0 | 0.3 | 0.5 |
| 79 | 1.0 | 1.0 | 0.7 | 0.1 | 0.5 | 0.6 | 0.5 | 0.6 | 0. | 0.0 | 0.2 | 0.6 |
| Average | 0.8 | 0.7 | 0.6 | 0.2 | 0.5 | 0.6 | 0.5 | 0.4 | 0.2 | 0 | 0.2 | 0.5 |

Note: Net irrigation area = 600 ha (in future)

TABLE-VII.18 IRRIGATION DIVERSION REQUIREMENT AT NASISI HEADWORKS

(Unit: $m^3/sec$)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 1.2 | 0.7 | 0.6 | 0.3 | 0.6 | 1.1 | 0.3 | 0.7 | 0.1 | 0.0 | 0.3 | 0.2 |
| 57 | 0.8 | 1.2 | 0.8 | 0.2 | 0.8 | 0.9 | 0.7 | 0.3 | 0.3 | 0.0 | 0.3 | 1.0 |
| 58 | 1.0 | 1.1 | 0.8 | 0.3 | 0.7 | 1.0 | 0.8 | 0.5 | 0.2 | 0. | 0.3 | 1.1 |
| 59 | 1.2 | 1.0 | 0.6 | 0.3 | 0.6 | 1.2 | 0.6 | 0.6 | 0.3 | 0.0 | 0.3 | 0.3 |
| 1960 | 1.1 | 1.0 | 0.8 | 0.3 | 0.7 | 0.9 | 0.7 | 0.6 | 0.2 | 0.0 | 0.3 | 0.6 |
| 61 | 1.5 | 1.5 | 0.9 | 0.3 | 0.6 | 0.9 | 0.6 | 0.6 | 0.3 | 0.0 | 0.4 | 1.0 |
| 62 | 1.1 | 1.1 | 0.8 | 0.3 | 0.5 | 0.6 | 0.5 | 0.6 | 0.2 | 0.0 | 0.3 | 1.1 |
| 63 | 1.5 | 1.2 | 1.0 | 0.3 | 0.7 | 0.6 | 1.1 | 0.8 | 0.3 | 0.0 | 0.4 | 0.8 |
| 64 | 1.0 | 1.1 | 0.9 | 0.2 | 0.8 | 0.9 | 1.2 | 0.8 | 0.3 | 0.0 | 0.3 | 0.5 |
| 1965 | 1.2 | 1.3 | 1.0 | 0.3 | 0.8 | 1.1 | 0.9 | 1.2 | 0.5 | 0.1 | 0.4 | 1.0 |
| 66 | 0.7 | 1.3 | 0.8 | 0.3 | 0.7 | 1.1 | 0.6 | 0.9 | 0.4 | 0.0 | 0.3 | 0.3 |
| 67 | 0.4 | 1.0 | 0.8 | 0.3 | 0.8 | 1.2 | 0.6 | 0.5 | 0.1 | 0.0 | 0.4 | 1.1 |
| 68 | 1.2 | 1.1 | 1.0 | 0.3 | 0.7 | 0.9 | 0.7 | 0.6 | 0.2 | 0. | 0.3 | 0.5 |
| 69 | 1.1 | 1.0 | 1.0 | 0.3 | 0.8 | 0.9 | 0.6 | 0.8 | 0.2 | 0.1 | 0.4 | 0.5 |
| 1970 | 0.8 | 0.7 | 0.8 | 0.3 | 0.8 | 1.2 | 0.3 | 0.3 | 0.2 | 0.0 | 0.2 | 0.8 |
| 71 | 0.8 | 1.1 | 0.6 | 0.3 | 0.4 | 0.9 | 0.4 | 1.0 | 0.5 | 0.0 | 0.4 | 0.3 |
| 72 | 1.5 | 1.0 | 0.6 | 0.3 | 0.7 | 0.8 | 0.4 | 0.2 | 0.2 | 0.0 | 0.3 | 0.8 |
| 73 | 1.5 | 1.4 | 0.6 | 0.3 | 0.7 | 0.8 | 0.4 | 0.2 | 0.2 | 0.0 | 0.3 | 0.8 |
| 74 | 1.3 | 0.8 | 0.9 | 0.3 | 0.8 | 0.4 | 0.3 | 1.1 | 0.6 | 0.0 | 0.3 | 0.5 |
| 1975 | 0.9 | 1.2 | 0.7 | 0.2 | 0.8 | 0.7 | 0.6 | 0.4 | 0.1 | 0.0 | 0.2 | 1.1 |
| 76 | 0.9 | 0.6 | 0.8 | 0.3 | 0.5 | 0.5 | 1.5 | 0.2 | 0.2 | 0.0 | 0.2 | 0.3 |
| 77 | 1.1 | 0.8 | 0.9 | 0.3 | 0.6 | 1.5 | 0.2 | 0.6 | 0.2 | 0.0 | 0.3 | 0.6 |
| 78 | 1.5 | 1.4 | 0.8 | 0.2 | 0.7 | 0.8 | 0.8 | 0.5 | 0.3 | 0.0 | 0.4 | 0.8 |
| 79 | 1.5 | 1.4 | 1.0 | 0.2 | 0.8 | 0.9 | 0.7 | 0.9 | 0. | 0.0 | 0.3 | 0.9 |
| Average | 1.1 | 1.1 | 0.8 | 0.3 | 0.7 | 0.9 | 0.7 | 0.6 | 0.3 | 0 | 0.3 | 0.7 |

Note: Net irrigation area = 900 ha (in future)

TABLE-VII.19 IRRIGATION DIVERSION REQUIREMENT AT MAHABA HEADWORKS

(Unit: $m^3/sec$)

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 0.6 | 0.4 | 0.3 | 0.1 | 0.5 | 0.9 | 0.3 | 0.5 | 0.1 | 0.0 | 0.1 | 0.1 |
| 57 | 0.4 | 0.6 | 0.4 | 0.1 | 0.7 | 0.7 | 0.6 | 0.2 | 0.2 | 0.0 | 0.2 | 0.5 |
| 58 | 0.5 | 0.5 | 0.4 | 0.1 | 0.6 | 0.8 | 0.7 | 0.4 | 0.2 | 0.0 | 0.1 | 0.5 |
| 59 | 0.6 | 0.5 | 0.3 | 0.1 | 0.4 | 0.9 | 0.5 | 0.4 | 0.2 | 0.0 | 0.1 | 0.1 |
| 1960 | 0.5 | 0.5 | 0.4 | 0.1 | 0.5 | 0.7 | 0.5 | 0.4 | 0.2 | 0.0 | 0.1 | 0.3 |
| 61 | 0.8 | 0.7 | 0.4 | 0.1 | 0.5 | 0.8 | 0.4 | 0.4 | 0.3 | 0.0 | 0.2 | 0.5 |
| 62 | 0.6 | 0.5 | 0.4 | 0.1 | 0.4 | 0.5 | 0.4 | 0.5 | 0.2 | 0.1 | 0.1 | 0.5 |
| 63 | 0.8 | 0.6 | 0.5 | 0.1 | 0.6 | 0.5 | 0.9 | 0.1 | 0.2 | 0.0 | 0.2 | 0.4 |
| 64 | 0.5 | 0.5 | 0.4 | 0.1 | 0.7 | 0.7 | 0.9 | 0.7 | 0.2 | 0.0 | 0.2 | 0.2 |
| 1965 | 0.6 | 0.6 | 0.5 | 0.1 | 0.7 | 0.9 | 0.7 | 0.9 | 0.4 | 0.1 | 0.2 | 0.5 |
| 66 | 0.4 | 0.6 | 0.4 | 0.1 | 0.5 | 0.9 | 0.4 | 0.8 | 0.3 | 0.0 | 0.1 | 0.2 |
| 67 | 0.2 | 0.5 | 0.4 | 0.1 | 0.7 | 1.0 | 0.5 | 0.4 | 0.1 | 0.0 | 0.2 | 0.5 |
| 68 | 0.6 | 0.5 | 0.5 | 0.1 | 0.5 | 0.7 | 0.5 | 0.4 | 0.2 | 0.0 | 0.1 | 0.2 |
| 69 | 0.5 | 0.5 | 0.5 | 0.1 | 0.7 | 0.7 | 0.5 | 0.7 | 0.2 | 0.1 | 0.2 | 0.3 |
| 1970 | 0.4 | 0.3 | 0.4 | 0.1 | 0.7 | 1.0 | 0.2 | 0.2 | 0.2 | 0.0 | 0.1 | 0.4 |
| 71 | 0.4 | 0.5 | 0.3 | 0.1 | 0.4 | 0.7 | 0.3 | 0.8 | 0.4 | 0.0 | 0.2 | 0.1 |
| 72 | 0.7 | 0.5 | 0.3 | 0.1 | 0.6 | 0.6 | 0.3 | 0.1 | 0.2 | 0.0 | 0.2 | 0.4 |
| 73 | 0.7 | 0.7 | 0.5 | 0.1 | 0.7 | 1.0 | 0.7 | 0.5 | 0.2 | 0.0 | 0.1 | 0.2 |
| 74 | 0.6 | 0.4 | 0.4 | 0.1 | 0.6 | 0.3 | 0.2 | 0.9 | 0.5 | 0.0 | 0.1 | 0.3 |
| 1975 | 0.4 | 0.6 | 0.4 | 0.1 | 0.7 | 0.6 | 0.5 | 0.4 | 0.1 | 0.0 | 0.1 | 0.5 |
| 76 | 0.4 | 0.3 | 0.4 | 0.1 | 1.0 | 1.0 | 1.1 | 0.2 | 0.2 | 0.0 | 0.1 | 0.1 |
| 77 | 0.5 | 0.4 | 0.4 | 0.1 | 0.5 | 1.2 | 0.2 | 0.5 | 0.2 | 0.1 | 0.1 | 0.6 |
| 78 | 0.8 | 0.7 | 0.4 | 0.1 | 0.5 | 0.7 | 0.7 | 0.4 | 0.3 | 0.0 | 0.2 | 0.4 |
| 79 | 0.8 | 0.7 | 0.5 | 0.1 | 0.6 | 0.7 | 0.6 | 0.7 | 0.0 | 0.1 | 0.2 | 0.4 |
| Average | 0.5 | 0.5 | 0.4 | 0.1 | 0.6 | 0.8 | 0.5 | 0.5 | 0.2 | 0.02 | 0.2 | 0.4 |

Note: Net irrigation area: Wet season = 700 ha, Dry season = 450 ha (in future)

TABLE-VII.20 IRRIGATION DIVERSION REQUIREMENT AT HIBIGA HEADWORKS

(Unit: $m^3/sec$)

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 0.6 | 0.4 | 0.4 | 0.1 | 0.4 | 0.6 | 0.2 | 0.4 | 0.0 | 0.0 | 0.1 | 0.1 |
| 57 | 0.4 | 0.6 | 0.5 | 0.1 | 0.5 | 0.5 | 0.4 | 0.1 | 0.1 | 0.0 | 0.2 | 0.5 |
| 58 | 0.5 | 0.6 | 0.5 | 0.1 | 0.4 | 0.5 | 0.5 | 0.3 | 0.1 | 0.0 | 0.1 | 0.6 |
| 59 | 0.6 | 0.5 | 0.3 | 0.1 | 0.3 | 0.6 | 0.4 | 0.3 | 0.1 | 0.0 | 0.1 | 0.1 |
| 1960 | 0.6 | 0.5 | 0.5 | 0.1 | 0.4 | 0.5 | 0.4 | 0.3 | 0.1 | 0.0 | 0.1 | 0.4 |
| 61 | 0.9 | 0.8 | 0.5 | 0.1 | 0.4 | 0.5 | 0.3 | 0.3 | 0.2 | 0.0 | 0.2 | 0.5 |
| 62 | 0.6 | 0.6 | 0.4 | 0.1 | 0.3 | 0.4 | 0.2 | 0.4 | 0.1 | 0.0 | 0.1 | 0.6 |
| 63 | 0.9 | 0.6 | 0.5 | 0.1 | 0.4 | 0.4 | 0.6 | 0.0 | 0.1 | 0.0 | 0.2 | 0.5 |
| 64 | 0.5 | 0.6 | 0.5 | 0.1 | 0.5 | 0.5 | 0.6 | 0.5 | 0.1 | 0.0 | 0.2 | 0.2 |
| 1965 | 0.6 | 0.7 | 0.5 | 0.1 | 0.5 | 0.6 | 0.5 | 0.6 | 0.3 | 0.0 | 0.2 | 0.5 |
| 66 | 0.4 | 0.7 | 0.5 | 0.1 | 0.4 | 0.6 | 0.3 | 0.5 | 0.2 | 0.0 | 0.1 | 0.2 |
| 67 | 0.2 | 0.5 | 0.4 | 0.1 | 0.5 | 0.7 | 0.4 | 0.2 | 0.0 | 0.0 | 0.2 | 0.6 |
| 68 | 0.7 | 0.6 | 0.5 | 0.1 | 0.4 | 0.5 | 0.4 | 0.3 | 0.1 | 0.0 | 0.1 | 0.2 |
| 69 | 0.6 | 0.5 | 0.5 | 0.1 | 0.5 | 0.5 | 0.4 | 0.5 | 0.1 | 0.0 | 0.2 | 0.3 |
| 1970 | 0.5 | 0.4 | 0.5 | 0.1 | 0.5 | 0.7 | 0.1 | 0.1 | 0.1 | 0.0 | 0.1 | 0.4 |
| 71 | 0.5 | 0.6 | 0.4 | 0.1 | 0.2 | 0.5 | 0.2 | 0.5 | 0.2 | 0.0 | 0.2 | 0.1 |
| 72 | 0.8 | 0.5 | 0.4 | 0.1 | 0.4 | 0.4 | 0.2 | 0.0 | 0.1 | 0.0 | 0.2 | 0.5 |
| 73 | 0.8 | 0.7 | 0.5 | 0.1 | 0.5 | 0.7 | 0.5 | 0.4 | 0.1 | 0.0 | 0.1 | 0.2 |
| 74 | 0.7 | 0.5 | 0.5 | 0.1 | 0.4 | 0.2 | 0.1 | 0.6 | 0.4 | 0.0 | 0.1 | 0.3 |
| 1975 | 0.5 | 0.6 | 0.4 | 0.1 | 0.5 | 0.4 | 0.4 | 0.2 | 0.0 | 0.0 | 0.1 | 0.6 |
| 76 | 0.5 | 0.4 | 0.4 | 0.1 | 0.7 | 0.7 | 0.8 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 |
| 77 | 0.6 | 0.5 | 0.5 | 0.1 | 0.4 | 0.9 | 0.1 | 0.4 | 0.1 | 0.0 | 0.1 | 0.6 |
| 78 | 0.9 | 0.8 | 0.5 | 0.1 | 0.4 | 0.5 | 0.5 | 0.2 | 0.2 | 0.0 | 0.2 | 0.5 |
| 79 | 0.9 | 0.8 | 0.5 | 0.1 | 0.4 | 0.5 | 0.4 | 0.5 | 0.0 | 0.0 | 0.2 | 0.5 |
| Average | 0.6 | 0.6 | 0.5 | 0.1 | 0.4 | 0.5 | 0.4 | 0.3 | 0.1 | 0.0 | 0.2 | 0.4 |

Note: Net irrigation area = 500 ha (in future)

## TABLE-VII.21 CONVERSION RATIO FOR CALCULATION OF EXPECTED RIVER RUNOFF

| River (Headworks) | Drainage Area 1/ | Gauging Station Used | | Conversion Ratio 2/ |
|---|---|---|---|---|
| | | Name | Drainage Area | |
| | ($km^2$) | | ($km^2$) | |
| Cabilogan HW | 122 | Bobongsuran | 131 | 0.947 |
| Ogsong River 3/ | 28.2 | Ogsong | 11 | 2.564 |
| Nasisi HW | 39 | Nasisi | 39 | 1.0 |
| Mahaba HW | 6.4 | Nasisi | 39 | 0.254 |
| Hibiga HW | 5.7 | Nasisi | 39 | 0.233 |
| Polangui River 4/ | 25.8 | Nasisi | 39 | 0.731 |

Note: 1/: Irrigation areas of the National Irrigation Systems are excluded from the drainage area. The return flow from irrigation area is not taken into account.

2/: Refer to Fig.I-30.

3/: Confluence with the Nasisi River.

4/: At the existing Quinali Headworks.

TABLE-VII.22 MONTHLY MEAN DISCHARGE AT CABILOGAN HEADWORKS

(Unit: $m^3/sec$)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | - | - | - | 4.6 | 4.6 | 4.3 | 7.6 | 7.6 | 11.6 | 8.4 | 8.9 | 17.0 |
| 57 | 11.9 | 6.7 | 5.5 | 6.9 | 4.1 | 5.9 | 6.9 | 9.1 | 7.4 | 5.9 | 7.2 | 3.1 |
| 58 | 5.1 | 4.5 | 4.0 | 2.5 | 1.4 | 1.6 | 5.3 | 6.3 | 4.6 | 9.4 | 11.9 | 3.2 |
| 59 | 2.7 | 4.1 | 4.2 | 2.7 | 2.0 | 0.9 | 2.4 | 3.7 | 3.2 | 4.8 | 4.7 | 9.0 |
| 1960 | 7.0 | 4.9 | 3.9 | 13.0 | 4.5 | 7.2 | 7.8 | 5.6 | 6.6 | 6.7 | 6.9 | 6.1 |
| 61 | 6.1 | 4.0 | 3.7 | 4.0 | 4.3 | 5.6 | 4.6 | 6.0 | 8.2 | 6.7 | 6.1 | 7.7 |
| 62 | 4.1 | 3.5 | 4.0 | 3.7 | 8.7 | 5.5 | 8.3 | 7.9 | 8.7 | 8.1 | 9.1 | 5.0 |
| 63 | 3.9 | 3.9 | 3.5 | 2.9 | 2.4 | 5.8 | 7.3 | 8.6 | 7.3 | 6.6 | 6.4 | 5.9 |
| 64 | 5.4 | 4.5 | 2.7 | 2.9 | 2.6 | 4.1 | 5.2 | 5.9 | 6.8 | 8.4 | 6.1 | 9.9 |
| 1965 | 6.8 | 6.1 | 3.4 | 3.4 | 3.1 | 3.5 | 11.9 | 8.7 | 10.3 | 7.1 | 7.5 | 5.7 |
| 66 | 7.8 | 2.8 | 3.7 | 3.7 | 3.6 | 2.9 | 2.9 | 3.6 | 2.8 | 3.0 | 5.4 | 6.8 |
| 67 | 8.0 | 4.5 | 5.2 | 3.8 | 3.1 | 3.8 | 6.7 | 6.8 | 7.5 | 6.3 | 7.8 | 3.7 |
| 68 | 4.5 | 3.7 | 3.3 | 3.1 | 4.4 | 6.3 | 6.0 | 9.9 | 5.2 | 1.2 | 2.3 | 4.2 |
| 69 | 3.2 | 3.0 | 2.9 | 3.4 | 3.6 | 4.9 | 6.3 | 2.6 | 5.3 | 4.7 | 3.9 | - |
| 1970 | - | - | - | 3.0 | 1.5 | - | - | - | - | 8.3 | 5.4 | |
| 71 | 5.4 | 3.1 | 2.1 | 1.4 | 4.9 | 2.6 | 8.0 | - | 6.3 | 9.7 | 7.1 | 13.3 |
| 72 | 11.3 | 6.0 | 6.8 | 5.8 | 5.7 | 9.3 | 8.0 | 8.5 | 11.6 | 7.9 | - | 10.0 |
| 73 | 6.9 | 4.5 | 4.5 | 3.9 | 4.4 | 11.0 | 8.4 | | | | | |
| 74 | - | 8.7 | 5.7 | 5.3 | 5.2 | - | 6.7 | 4.2 | 4.1 | 6.9 | 8.9 | 6.3 |
| 1975 | 8.4 | - | 4.2 | 3.5 | 3.6 | 5.7 | 10.3 | 10.5 | - | 5.1 | 3.1 | 27.7 |
| 76 | 9.7 | 2.1 | 4.1 | 2.4 | 8.2 | 6.6 | 6.5 | 12.0 | 10.9 | 6.4 | 12.7 | 15.4 |
| 77 | 6.2 | 8.5 | 8.4 | 17.5 | 7.1 | 8.8 | 17.0 | 9.8 | 16.4 | 6.9 | 18.1 | 3.4 |
| 78 | 6.6 | 7.2 | 3.8 | 4.8 | 6.0 | 8.4 | - | - | - | 19.2 | 3.8 | 12.9 |
| 79 | | | | | | | | | | | | |
| Average | 6.6 | 4.8 | 4.3 | 4.7 | 4.3 | 5.5 | 7.3 | 7.2 | 7.6 | 7.2 | 7.3 | 8.8 |

Note: Drainage area = 122 $km^2$

TABLE-VII.23 MONTHLY MEAN DISCHARGE AT OGSONG HEADWORKS

(Unit: $m^3/sec$)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 2.6 | 3.0 | 3.5 | 4.8 | 5.3 | 4.5 | 5.9 | 2.1 | 9.9 | 20.7 | 12.0 | 7.4 |
| 57 | 6.3 | 5.3 | 4.9 | 4.8 | 14.6 | 3.9 | 3.8 | 9.7 | 6.7 | 6.6 | 6.4 | 4.1 |
| 58 | 5.3 | 2.8 | 5.1 | 5.1 | 3.7 | 4.6 | 4.5 | 4.7 | 5.7 | 8.2 | 6.7 | 3.6 |
| 59 | 2.8 | 2.5 | 3.7 | 3.0 | 3.1 | 1.9 | 3.3 | 3.7 | 4.1 | 5.6 | 5.2 | 3.0 |
| 1960 | 1.2 | 1.4 | 1.3 | - | - | 15.4 | 3.5 | 5.2 | 11.1 | 13.9 | 10.9 | 2.4 |
| 61 | 2.2 | 1.1 | 3.1 | 2.2 | 2.4 | 1.9 | 2.0 | 2.5 | 1.9 | 3.6 | 2.8 | 3.1 |
| 62 | 2.6 | 2.2 | 0.5 | 0.7 | 2.7 | 1.3 | 3.9 | 2.8 | 1.4 | 1.7 | 3.2 | 1.5 |
| 63 | 0.3 | 0.8 | 0.2 | 0.1 | 0.1 | 2.7 | 1.4 | 0.9 | 1.7 | 2.6 | 3.8 | 1.3 |
| 64 | 4.3 | 0.4 | 0.2 | - | 1.6 | 0.6 | 0.2 | 0.5 | 0.7 | 4.7 | 3.7 | 2.9 |
| 1965 | 2.4 | 0.8 | 0.7 | 0.2 | 0.5 | 0.9 | 2.7 | 1.7 | 2.6 | 2.4 | 3.9 | 4.4 |
| 66 | 6.2 | 7.9 | 0.5 | 0.1 | 0.9 | 1.4 | 2.2 | 1.5 | 1.4 | 0.6 | 1.7 | 2.0 |
| 67 | 1.4 | 0.9 | - | 1.4 | 0.6 | 0.1 | 0.9 | 0.9 | 1.4 | 1.3 | 3.0 | 1.3 |
| 68 | 2.6 | 1.3 | 1.4 | 1.5 | 1.6 | 0.7 | 0.1 | 0.2 | 4.0 | 4.6 | 5.5 | 4.8 |
| 69 | 2.8 | 0.1 | 0.1 | 0.1 | 0.0 | 1.0 | 1.8 | 1.4 | 1.3 | 0.8 | 1.6 | 1.7 |
| 1970 | 0.2 | 2.5 | 0.1 | 0.2 | 0.2 | 0.2 | 0.6 | 1.8 | 0.7 | 2.0 | 1.8 | 1.8 |
| 71 | 0.8 | 0.6 | 0.9 | 0.1 | 1.6 | 1.4 | 1.3 | 0.1 | 0.3 | 3.5 | 3.1 | 7.1 |
| 72 | 2.4 | 0.1 | 0.4 | 1.0 | 0.8 | 2.6 | 2.2 | 2.6 | 4.6 | 2.1 | 2.5 | 1.7 |
| 73 | 0.9 | 0.1 | 0.1 | 0.4 | 0.5 | 0.2 | 1.4 | 6.6 | 2.5 | 1.3 | 1.5 | 11.5 |
| 74 | 0.5 | 4.0 | 3.2 | 0.5 | 0.5 | 5.0 | 3.9 | 0.7 | 6.2 | 10.0 | 16.2 | 5.7 |
| 1975 | - | - | - | 3.2 | 1.7 | 0.7 | 4.4 | 3.3 | 4.9 | 5.9 | 6.2 | 9.5 |
| 76 | 2.1 | 1.3 | 0.6 | 0.9 | 0.9 | 1.5 | 1.3 | 2.1 | 1.7 | 0.9 | 1.5 | 4.9 |
| 77 | 3.0 | 3.2 | 2.7 | 2.4 | 1.9 | 2.7 | 3.0 | 2.2 | 2.5 | 1.9 | 3.1 | 2.0 |
| 78 | 1.9 | 1.7 | 1.8 | 1.0 | 1.5 | 3.8 | - | - | - | 3.8 | 2.5 | 1.5 |
| 79 | | | | | | | | | | | | |
| Average | 2.5 | 2.0 | 1.7 | 1.6 | 2.1 | 2.6 | 2.5 | 2.6 | 3.5 | 4.7 | 5.3 | 3.9 |

Note: Drainage area = 28 $km^2$

TABLE-VII.24 MONTHLY MEAN DISCHARGE AT NASISI HEADWORKS

(Unit: $m^3/sec$)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 2.0 | 2.0 | 2.3 | 2.0 | 1.3 | 1.0 | 1.3 | 1.5 | 2.5 | 2.0 | 2.7 | 5.0 |
| 57 | 5.1 | 2.7 | 2.6 | 2.5 | 2.2 | 1.6 | 1.1 | 1.2 | 1.5 | 2.1 | 3.1 | 2.5 |
| 58 | 2.3 | 1.8 | 1.7 | 1.4 | 1.5 | 1.6 | 1.8 | 2.0 | 1.7 | 2.9 | 1.4 | 1.3 |
| 59 | 1.5 | 1.7 | 2.5 | 2.5 | 3.2 | 2.8 | 1.9 | 1.5 | 1.6 | 2.1 | 2.5 | 2.0 |
| 1960 | 1.0 | 0.9 | 0.9 | 1.7 | 2.0 | 5.1 | 1.9 | 1.8 | 2.5 | 2.9 | 3.2 | 3.0 |
| 61 | 3.2 | 2.3 | 2.3 | 1.8 | 2.0 | 1.6 | 2.0 | 2.0 | 1.6 | 1.6 | 2.0 | 2.5 |
| 62 | 2.5 | 2.1 | 2.2 | 1.8 | 2.5 | 1.8 | 1.8 | 1.9 | 1.8 | 1.6 | 3.8 | 2.0 |
| 63 | 1.5 | 2.1 | 1.6 | 1.4 | 1.4 | 2.6 | 1.4 | 2.9 | 1.8 | 1.7 | 2.1 | 1.8 |
| 64 | 2.3 | 1.6 | 1.5 | 1.5 | 1.4 | 2.0 | 1.7 | 1.7 | 2.6 | 1.3 | 1.8 | 3.8 |
| 1965 | 4.0 | 2.6 | 1.7 | 1.3 | 1.4 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.5 |
| 66 | 1.5 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.5 | 1.3 | 1.2 | 1.5 | 2.7 |
| 67 | 2.7 | 3.0 | 2.5 | 2.3 | 2.2 | 2.1 | 2.2 | 1.8 | 1.0 | 1.5 | 1.5 | 0.9 |
| 68 | 1.8 | 1.7 | 1.5 | 1.4 | 1.2 | 1.4 | 1.4 | 1.5 | 2.4 | 1.4 | 6.6 | 1.7 |
| 69 | 0.9 | 0.9 | 0.8 | 0.8 | 0.9 | 0.8 | 1.1 | 0.9 | 1.1 | 1.1 | 1.3 | 2.7 |
| 1970 | 0.9 | 0.9 | 0.8 | 0.7 | 0.7 | 0.6 | 0.6 | - | 0.6 | 2.0 | 0.7 | 0.8 |
| 71 | 0.7 | 0.8 | 0.7 | 0.6 | 0.9 | 0.8 | 0.9 | - | 0.6 | 1.0 | 1.7 | 3.0 |
| 72 | 11.4 | 1.0 | 1.0 | 0.9 | 0.7 | 1.1 | 1.9 | 1.8 | 2.0 | 2.1 | 2.8 | 3.5 |
| 73 | 2.9 | 2.2 | 2.1 | 2.0 | 1.7 | 1.7 | 1.7 | 2.0 | 1.7 | 3.1 | 8.4 | 12.9 |
| 74 | 4.6 | 3.9 | 2.4 | 1.7 | - | - | 3.4 | 2.0 | 1.8 | 2.3 | 4.6 | 5.2 |
| 1975 | 0.3 | 0.3 | 0.6 | 1.9 | 1.8 | 1.4 | 2.2 | 2.9 | 2.7 | 2.1 | 1.7 | 5.3 |
| 76 | 1.3 | 1.3 | 1.1 | 1.2 | 1.0 | 1.1 | 1.3 | 2.1 | 2.8 | 2.3 | 1.8 | 3.7 |
| 77 | 2.8 | 3.3 | 2.9 | 3.0 | 2.7 | 2.6 | 2.6 | 0.4 | 1.4 | 1.5 | 1.4 | 1.4 |
| 78 | 1.7 | 1.7 | 4.0 | 5.6 | 4.2 | 4.0 | - | - | - | 4.7 | 4.8 | - |
| 79 | | | | | | | | | | | | |
| Average | 2.6 | 1.8 | 1.8 | 1.8 | 1.7 | 1.8 | 1.7 | 1.7 | 1.7 | 2.0 | 2.7 | 3.1 |

Note: Drainage area = 39 $km^2$

TABLE-VII.25 MONTHLY MEAN DISCHARGE AT MAHABA HEADWORKS

(Unit: $m^3/sec$)

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 0.5 | 0.5 | 0.6 | 0.5 | 0.3 | 0.3 | 0.3 | 0.4 | 0.6 | 0.5 | 0.7 | 1.3 |
| 57 | 1.3 | 0.7 | 0.7 | 0.6 | 0.6 | 0.4 | 0.3 | 0.3 | 0.4 | 0.5 | 0.8 | 0.6 |
| 58 | 0.6 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.4 | 0.7 | 0.4 | 0.3 |
| 59 | 0.4 | 0.4 | 0.6 | 0.6 | 0.8 | 0.7 | 0.5 | 0.4 | 0.4 | 0.5 | 0.6 | 0.5 |
| 1960 | 0.3 | 0.2 | 0.2 | 0.4 | 0.5 | 1.3 | 0.5 | 0.5 | 0.6 | 0.7 | 0.8 | 0.8 |
| 61 | 0.8 | 0.6 | 0.6 | 0.5 | 0.5 | 0.4 | 0.5 | 0.5 | 0.4 | 0.4 | 0.5 | 0.6 |
| 62 | 0.6 | 0.5 | 0.6 | 0.5 | 0.6 | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 | 1.0 | 0.5 |
| 63 | 0.4 | 0.5 | 0.4 | 0.4 | 0.4 | 0.7 | 0.4 | 0.7 | 0.5 | 0.4 | 0.5 | 0.5 |
| 64 | 0.6 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.4 | 0.4 | 0.7 | 0.3 | 0.5 | 1.0 |
| 1965 | 1.0 | 0.7 | 0.4 | 0.3 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 |
| 66 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | 0.3 | 0.4 | 0.4 |
| 67 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 0.5 | 0.6 | 0.5 | 0.3 | 0.4 | 0.4 | 0.2 |
| 68 | 0.5 | 0.4 | 0.4 | 0.4 | 0.3 | 0.4 | 0.4 | 0.4 | 0.6 | 0.4 | 1.7 | 0.4 |
| 69 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.7 |
| 1970 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | - | 0.2 | 0.5 | 0.2 | 0.2 |
| 71 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | - | 0.2 | 0.3 | 0.4 | 0.8 |
| 72 | 2.9 | 0.3 | 0.3 | 0.2 | 0.2 | 0.3 | 0.5 | 0.5 | 0.5 | 0.5 | 0.7 | 0.9 |
| 73 | 0.7 | 0.6 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.5 | 0.4 | 0.8 | 2.1 | 3.3 |
| 74 | 1.2 | 1.0 | 0.6 | 0.4 | - | - | 0.9 | 0.5 | 0.5 | 0.6 | 1.2 | 1.3 |
| 1975 | 0.1 | 0.1 | 0.2 | 0.5 | 0.5 | 0.4 | 0.6 | 0.7 | 0.7 | 0.5 | 0.4 | 1.3 |
| 76 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.5 | 0.7 | 0.6 | 0.5 | 0.9 |
| 77 | 0.7 | 0.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.1 | 0.1 | 0.4 | 0.4 | 0.4 | 0.4 |
| 78 | 0.4 | 0.4 | 1.0 | 1.4 | 1.1 | 1.0 | - | - | - | 1.2 | 1.2 | - |
| 79 | | | | | | | | | | | | |
| Average | 0.7 | 0.5 | 0.5 | 0.5 | 0.4 | 0.5 | 0.4 | 0.4 | 0.4 | 0.5 | 0.7 | 0.8 |

Note: Catchment Area = 6.4 $km^2$

TABLE-VII.26 MONTHLY MEAN DISCHARGE AT HIBIGA HEADWORKS

(Unit: $m^3/sec$)

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 0.5 | 0.5 | 0.5 | 0.5 | 0.3 | 0.2 | 0.3 | 0.3 | 0.6 | 0.5 | 0.6 | 1.2 |
| 57 | 1.2 | 0.6 | 0.6 | 0.6 | 0.5 | 0.4 | 0.3 | 0.3 | 0.3 | 0.5 | 0.7 | 0.6 |
| 58 | 0.5 | 0.4 | 0.4 | 0.3 | 0.3 | 0.4 | 0.4 | 0.5 | 0.4 | 0.7 | 0.3 | 0.3 |
| 59 | 0.3 | 0.4 | 0.6 | 0.6 | 0.7 | 0.7 | 0.4 | 0.3 | 0.4 | 0.5 | 0.6 | 0.5 |
| 1960 | 0.2 | 0.2 | 0.2 | 0.4 | 0.5 | 1.2 | 0.4 | 0.4 | 0.6 | 0.7 | 0.7 | 0.7 |
| 61 | 0.7 | 0.5 | 0.5 | 0.4 | 0.5 | 0.4 | 0.5 | 0.5 | 0.4 | 0.4 | 0.5 | 0.6 |
| 62 | 0.6 | 0.5 | 0.5 | 0.4 | 0.6 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.9 | 0.5 |
| 63 | 0.3 | 0.5 | 0.4 | 0.3 | 0.3 | 0.6 | 0.3 | 0.7 | 0.4 | 0.4 | 0.5 | 0.4 |
| 64 | 0.5 | 0.4 | 0.3 | 0.3 | 0.3 | 0.5 | 0.4 | 0.4 | 0.6 | 0.3 | 0.4 | 0.9 |
| 1965 | 0.9 | 0.6 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 66 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.6 |
| 67 | 0.6 | - | 0.6 | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 | 0.2 | 0.3 | 0.3 | 0.2 |
| 68 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.6 | 0.3 | 1.5 | 0.4 |
| 69 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.6 |
| 1970 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | - | 0.1 | 0.5 | 0.2 | 0.2 |
| 71 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | - | 0.1 | 0.2 | 0.4 | 0.7 |
| 72 | 2.7 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.4 | 0.4 | 0.5 | 0.5 | 0.6 | 0.8 |
| 73 | 0.7 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.5 | 0.4 | 0.7 | 2.0 | 3.0 |
| 74 | 1.1 | 0.9 | 0.6 | 0.4 | - | - | 0.8 | 0.5 | 0.4 | 0.5 | 1.1 | 1.2 |
| 1975 | 0.1 | 0.1 | 0.1 | 0.4 | 0.4 | 0.3 | 0.5 | 0.7 | 0.6 | 0.5 | 0.4 | 1.2 |
| 76 | 0.3 | 0.3 | 0.2 | 0.3 | 0.2 | 0.2 | 0.3 | 0.5 | 0.7 | 0.5 | 0.4 | 0.9 |
| 77 | 0.6 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.1 | 0.3 | 0.3 | 0.3 | 0.3 |
| 78 | 0.4 | 0.4 | 0.9 | 1.3 | 1.0 | 0.9 | - | - | - | 1.1 | 1.1 | - |
| 79 | | | | | | | | | | | | |
| Average | 0.6 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.6 | 0.7 |

Note: Drainage Area = 5.7 $km^2$

TABLE-VII.27 MONTHLY MEAN DISCHARGE FOR THE POLANGUI RIVER

(Unit: $m^3/sec$)

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 1.5 | 1.5 | 1.7 | 1.5 | 1.0 | 0.7 | 1.0 | 1.1 | 1.8 | 1.5 | 2.0 | 3.7 |
| 57 | 3.7 | 2.0 | 1.9 | 1.8 | 1.6 | 1.2 | 0.8 | 0.9 | 1.1 | 1.5 | 2.3 | 1.8 |
| 58 | 1.7 | 1.3 | 1.2 | 1.0 | 1.1 | 1.2 | 1.3 | 1.5 | 1.2 | 2.1 | 1.0 | 1.0 |
| 59 | 1.1 | 1.2 | 1.8 | 1.8 | 2.3 | 2.0 | 1.4 | 1.1 | 1.2 | 1.5 | 1.8 | 1.5 |
| 1960 | 0.7 | 0.7 | 0.7 | 1.2 | 1.5 | 3.7 | 1.4 | 1.3 | 1.8 | 2.1 | 2.3 | 2.2 |
| 61 | 2.3 | 1.7 | 1.7 | 1.3 | 1.5 | 1.2 | 1.5 | 1.5 | 1.2 | 1.2 | 1.5 | 1.8 |
| 62 | 1.8 | 1.5 | 1.6 | 1.3 | 1.8 | 1.3 | 1.3 | 1.4 | 1.3 | 1.2 | 2.8 | 1.5 |
| 63 | 1.1 | 1.5 | 1.2 | 1.0 | 1.0 | 1.9 | 1.0 | 2.1 | 1.3 | 1.2 | 1.5 | 1.3 |
| 64 | 1.7 | 1.2 | 1.1 | 1.1 | 1.0 | 1.5 | 1.2 | 1.2 | 1.9 | 1.0 | 1.3 | 2.8 |
| 1965 | 2.9 | 1.9 | 1.2 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 |
| 66 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.0 | 0.9 | 1.1 | 2.0 |
| 67 | 2.0 | 2.2 | 1.8 | 1.7 | 1.6 | 1.5 | 1.6 | 1.3 | 0.7 | 1.1 | 1.1 | 0.7 |
| 68 | 1.3 | 1.2 | 1.1 | 1.0 | 0.9 | 1.0 | 1.0 | 1.1 | 1.8 | 1.0 | 4.8 | 1.2 |
| 69 | 0.7 | 0.7 | 0.6 | 0.6 | 0.7 | 0.6 | 0.8 | 0.7 | 0.8 | 0.8 | 1.0 | 2.0 |
| 1970 | 0.7 | 0.7 | 0.6 | 0.5 | 0.5 | 0.4 | 0.4 | - | 0.4 | 1.5 | 0.5 | 0.6 |
| 71 | 0.5 | 0.6 | 0.5 | 0.4 | 0.7 | 0.6 | 0.7 | - | 0.4 | 0.7 | 1.2 | 2.2 |
| 72 | 8.3 | 0.7 | 0.7 | 0.7 | 0.5 | 0.8 | 1.4 | 1.3 | 1.5 | 1.5 | 2.0 | 2.6 |
| 73 | 2.1 | 1.6 | 1.5 | 1.5 | 1.2 | 1.2 | 1.2 | 1.5 | 1.2 | 2.3 | 6.1 | 9.4 |
| 74 | 3.4 | 2.9 | 1.8 | 1.2 | - | - | 2.5 | 1.5 | 1.3 | 1.7 | 3.4 | 3.8 |
| 1975 | 0.2 | 0.2 | 0.4 | 1.4 | 1.3 | 1.0 | 1.6 | 2.1 | 2.0 | 1.5 | 1.2 | 3.9 |
| 76 | 1.0 | 1.0 | 0.8 | 0.9 | 0.7 | 0.8 | 1.0 | 1.5 | 2.0 | 1.7 | 1.3 | 2.7 |
| 77 | 2.0 | 2.4 | 2.1 | 2.2 | 2.0 | 1.9 | 1.9 | 0.3 | 1.0 | 1.1 | 1.0 | 1.0 |
| 78 | 1.2 | 1.2 | 2.9 | 4.1 | 3.1 | 2.9 | - | - | - | 3.4 | 3.5 | - |
| 79 | | | | | | | | | | | | |
| Average | 1.9 | 1.3 | 1.3 | 1.3 | 1.2 | 1.3 | 1.2 | 1.2 | 1.2 | 1.5 | 2.0 | 2.3 |

Note: Drainage area = 25.8 $km^2$, Irrigation area of the National Irrigation Systems and drainage area upstream of the Hibiga Headworks (5.7 $km^2$) are excluded.

TABLE-VII.28 MONTHLY MEAN AVAILABLE DISCHARGE AT SOUTH QUINALI HEADWORKS

(Unit: $m^3/sec$)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | - | - | - | 10.5 | 9.2 | 6.2 | 13.7 | 9.0 | 23.7 | 31.1 | 22.7 | 28.7 |
| 57 | 20.9 | 10.9 | 10.3 | 13.6 | 18.2 | 8.5 | 9.5 | 19.1 | 14.7 | 14.6 | 15.6 | 6.5 |
| 58 | 9.5 | 5.6 | 8.2 | 8.1 | 4.3 | 4.6 | 8.9 | 11.3 | 11.4 | 20.5 | 19.1 | 4.6 |
| 59 | 3.2 | 5.1 | 8.6 | 7.3 | 6.5 | 2.7 | 5.6 | 7.1 | 8.0 | 12.5 | 11.5 | 13.1 |
| 1960 | 5.8 | 4.1 | 3.4 | - | - | 24.8 | 11.2 | 10.8 | 19.5 | 23.5 | 20.1 | 9.5 |
| 61 | 6.6 | 2.7 | 6.2 | 7.1 | 6.7 | 6.1 | 6.8 | 8.7 | 10.6 | 11.9 | 9.6 | 10.1 |
| 62 | 5.5 | 4.3 | 4.3 | 5.3 | 12.3 | 6.6 | 12.5 | 10.6 | 11.3 | 11.3 | 15.2 | 5.0 |
| 63 | 1.5 | 3.0 | 2.6 | 3.6 | 2.0 | 9.1 | 6.6 | 11.5 | 9.9 | 10.9 | 11.0 | 6.3 |
| 64 | 8.8 | 3.3 | 1.9 | - | 3.4 | 3.9 | 3.9 | 5.5 | 9.2 | 14.4 | 10.5 | 15.1 |
| 1965 | 9.4 | 5.4 | 2.6 | 4.0 | 2.4 | 2.0 | 13.0 | 7.9 | 12.6 | 10.5 | 11.3 | 8.4 |
| 66 | 13.2 | 7.8 | 2.9 | 4.4 | 3.6 | 2.1 | 4.6 | 3.6 | 4.2 | 4.8 | 7.7 | 10.4 |
| 67 | 10.8 | 5.2 | | 6.6 | 3.3 | 2.7 | 7.8 | 8.0 | 9.6 | 9.1 | 10.9 | 2.5 |
| 68 | 4.9 | 3.2 | 3.0 | 5.1 | 5.0 | 5.5 | 5.7 | 10.0 | 10.9 | 7.2 | 13.5 | 9.2 |
| 69 | 3.6 | 1.5 | 1.4 | 3.5 | 2.4 | 3.9 | 7.2 | 2.3 | 7.1 | 6.3 | 5.5 | - |
| 1970 | - | - | - | 3.0 | 0.2 | - | - | - | - | 12.3 | 7.1 | - |
| 71 | 4.4 | 1.4 | 1.7 | 1.3 | 6.0 | 2.0 | 8.9 | - | 5.7 | 14.2 | 10.6 | 22.5 |
| 72 | 20.4 | 4.5 | 6.2 | 6.8 | 4.9 | 10.6 | 10.8 | 12.5 | 17.5 | 12.1 | - | 12.5 |
| 73 | 6.1 | 3.2 | 4.2 | 5.4 | 4.0 | 9.5 | 8.6 | | | | | |
| 74 | - | 13.9 | 8.4 | 6.6 | - | - | 15.1 | 3.4 | 10.1 | 19.2 | 28.8 | 17.5 |
| 1975 | - | - | - | 8.0 | 4.4 | 5.5 | 14.9 | 15.3 | - | 13.1 | 10.4 | 39.0 |
| 76 | 10.2 | 2.7 | 3.4 | 3.6 | 7.3 | 6.4 | 4.6 | 15.4 | 14.8 | 9.6 | 15.2 | 23.0 |
| 77 | 8.5 | 12.3 | 11.1 | 22.0 | 9.7 | 9.2 | 21.8 | 10.6 | 19.7 | 10.2 | 21.7 | 3.6 |
| 78 | 5.3 | 6.0 | 7.5 | 10.7 | 9.5 | 13.5 | - | - | - | 27.7 | 9.7 | - |
| 79 | | | | | | | | | | | | |
| Average | 8.3 | 5.3 | 5.2 | 7.0 | 6.0 | 6.9 | 9.6 | 9.6 | 12.1 | 14.0 | 13.7 | 13.0 |

Note: Drainage area = 199 $km^2$ (excluding existing irrigation area)

TABLE-VII.29 MONTHLY MEAN AVAILABLE DISCHARGE AT QUINALI HEADWORKS

(Unit: $m^3/sec$)

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 1.5 | 1.6 | 2.1 | 2.3 | 1.0 | 0.7 | 1.1 | 1.1 | 2.9 | 2.5 | 3.1 | 6.0 |
| 57 | 5.4 | 2.1 | 2.3 | 2.8 | 1.6 | 1.2 | 0.8 | 1.2 | 1.5 | 2.5 | 3.4 | 2.0 |
| 58 | 1.8 | 1.3 | 1.3 | 1.5 | 1.3 | 1.2 | 1.3 | 1.8 | 1.7 | 3.5 | 1.5 | 1.0 |
| 59 | 1.1 | 1.2 | 2.4 | 2.8 | 3.1 | 2.1 | 1.4 | 1.1 | 1.7 | 2.5 | 2.8 | 2.3 |
| 1960 | 0.7 | 0.7 | 0.7 | 1.8 | 1.6 | 5.0 | 1.4 | 1.5 | 2.5 | 3.5 | 3.6 | 3.0 |
| 61 | 2.3 | 1.7 | 1.7 | 2.0 | 1.6 | 1.2 | 1.8 | 1.8 | 1.5 | 2.0 | 2.1 | 2.0 |
| 62 | 1.8 | 1.5 | 1.8 | 2.0 | 2.3 | 1.3 | 1.6 | 1.4 | 1.9 | 1.9 | 4.5 | 1.5 |
| 63 | 1.1 | 1.5 | 1.2 | 1.5 | 1.0 | 2.3 | 1.0 | 3.4 | 1.9 | 2.0 | 2.1 | 1.4 |
| 64 | 1.8 | 1.2 | 1.1 | 1.6 | 1.0 | 1.5 | 1.2 | 1.2 | 2.5 | 1.6 | 1.8 | 4.3 |
| 1965 | 3.6 | 2.0 | 1.2 | 1.4 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.5 | 1.2 | 1.1 |
| 66 | 1.2 | 1.0 | 1.0 | 1.4 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.5 | 1.6 | 2.6 |
| 67 | 2.9 | - | 2.2 | 2.6 | 1.6 | 1.5 | 1.8 | 1.6 | 1.1 | 1.8 | 1.4 | 0.7 |
| 68 | 1.3 | 1.2 | 1.1 | 1.5 | 0.9 | 1.0 | 1.0 | 1.1 | 2.7 | 1.7 | 7.8 | 1.6 |
| 69 | 0.7 | 0.7 | 0.6 | 0.8 | 0.7 | 0.6 | 0.8 | 0.7 | 1.1 | 1.3 | 1.2 | 2.7 |
| 1970 | 0.7 | 0.7 | 0.6 | 0.7 | 0.5 | 0.4 | 0.5 | - | 0.4 | 2.5 | 0.7 | 0.6 |
| 71 | 0.5 | 0.6 | 0.5 | 0.5 | 0.7 | 0.6 | 0.7 | - | 0.4 | 1.2 | 1.6 | 3.5 |
| 72 | 12.4 | 0.7 | 0.7 | 0.9 | 0.5 | 0.8 | 1.8 | 2.1 | 2.2 | 2.5 | 2.9 | 3.4 |
| 73 | 2.1 | 1.6 | 1.5 | 2.3 | 1.2 | 1.2 | 1.2 | 1.6 | 1.7 | 3.8 | 10.0 | 15.3 |
| 74 | 4.4 | 3.9 | 2.1 | 1.8 | - | - | 3.9 | 1.5 | 1.3 | 2.8 | 5.5 | 5.7 |
| 1975 | 0.2 | 0.2 | 0.4 | 2.1 | 1.3 | 1.0 | 1.8 | 2.9 | 3.2 | 2.5 | 1.8 | 5.3 |
| 76 | 1.0 | 1.0 | 0.8 | 1.3 | 0.7 | 0.8 | 1.0 | 2.2 | 3.1 | 2.8 | 2.0 | 4.3 |
| 77 | 2.2 | 3.0 | 2.5 | 3.3 | 2.4 | 1.9 | 2.4 | 0.3 | 1.4 | 1.7 | 1.5 | 1.0 |
| 78 | 1.2 | 1.2 | 3.9 | 6.6 | 4.3 | 3.6 | - | - | - | 5.7 | 5.4 | - |
| 79 | | | | | | | | | | | | |
| Average | 2.3 | 1.4 | 1.5 | 2.0 | 1.4 | 1.5 | 1.4 | 1.5 | 1.8 | 2.4 | 2.6 | 3.2 |

TABLE-VII.30 MONTHLY MEAN DISCHARGE AT BANTAYAN HEADWORKS

(Unit: $m^3/sec$)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | - | - | - | 3.5 | 3.5 | 3.2 | 5.7 | 5.7 | 8.7 | 6.4 | 6.7 | 12.9 |
| 57 | 9.0 | 5.1 | 4.1 | 5.2 | 3.1 | 4.4 | 5.2 | 6.9 | 5.6 | 4.4 | 5.4 | 2.4 |
| 58 | 3.9 | 3.4 | 3.0 | 1.9 | 1.1 | 1.2 | 4.0 | 4.7 | 3.5 | 7.1 | 9.0 | 2.4 |
| 59 | 2.0 | 3.1 | 3.1 | 2.0 | 1.5 | 0.6 | 1.8 | 2.8 | 2.4 | 3.6 | 3.6 | 6.8 |
| 1960 | 5.3 | 3.7 | 2.9 | 9.8 | 3.4 | 5.4 | 5.9 | 4.2 | 5.0 | 5.1 | 5.2 | 4.6 |
| 61 | 4.6 | 3.0 | 2.8 | 3.0 | 3.2 | 4.2 | 3.5 | 4.5 | 6.2 | 5.1 | 4.6 | 5.8 |
| 62 | 3.1 | 2.6 | 3.0 | 2.8 | 6.6 | 4.1 | 6.3 | 5.9 | 6.6 | 6.1 | 6.9 | 3.8 |
| 63 | 2.9 | 2.9 | 2.6 | 2.2 | 1.8 | 4.4 | 5.5 | 6.5 | 5.5 | 5.0 | 4.9 | 4.4 |
| 64 | 4.1 | 3.4 | 2.0 | 2.2 | 1.9 | 3.1 | 3.9 | 4.4 | 5.1 | 6.4 | 4.6 | 7.5 |
| 1965 | 5.1 | 4.6 | 2.6 | 2.6 | 2.4 | 2.6 | 9.0 | 6.6 | 7.8 | 5.4 | 5.6 | 4.3 |
| 66 | 5.9 | 2.4 | 2.8 | 2.8 | 2.7 | 2.2 | 4.6 | 2.7 | 2.1 | 2.3 | 4.1 | 5.1 |
| 67 | 6.0 | 3.4 | 3.9 | 2.9 | 2.4 | 2.9 | 5.1 | 5.1 | 5.6 | 4.8 | 5.9 | 2.8 |
| 68 | 3.4 | 2.8 | 2.5 | 2.4 | 3.3 | 4.8 | 4.5 | 7.5 | 3.9 | 0.9 | 1.7 | 3.1 |
| 69 | 2.4 | 2.3 | 2.2 | 2.6 | 2.7 | 3.7 | 4.7 | 1.9 | 4.0 | 3.6 | 2.9 | - |
| 1970 | - | - | - | 2.3 | 1.1 | - | - | - | - | 6.3 | 4.1 | |
| 71 | 4.1 | 2.4 | 1.6 | 1.1 | 3.7 | 1.9 | 6.1 | - | 4.7 | 7.3 | 5.4 | 10.1 |
| 72 | 8.5 | 4.5 | 5.1 | 4.4 | 4.3 | 7.0 | 6.0 | 6.4 | 8.8 | 5.9 | - | 7.6 |
| 73 | 5.2 | 3.4 | 3.4 | 2.9 | 3.3 | 8.3 | 6.4 | | | | | |
| 74 | - | 6.6 | 4.3 | 4.0 | 3.9 | - | 5.1 | 3.1 | 3.1 | 5.2 | 6.7 | 4.7 |
| 1975 | 6.4 | - | 3.1 | 2.6 | 2.7 | 4.3 | 7.8 | 7.9 | - | 3.9 | 2.4 | 20.9 |
| 76 | 7.3 | 1.6 | 3.1 | 1.8 | 6.2 | 5.0 | 4.9 | 9.1 | 8.2 | 4.9 | 9.6 | 11.7 |
| 77 | 4.6 | 6.4 | 6.4 | 13.2 | 5.4 | 6.6 | 12.9 | 7.4 | 12.4 | 5.2 | 13.7 | 2.6 |
| 78 | 5.0 | 5.4 | 2.9 | 3.6 | 4.5 | 6.4 | - | - | - | 14.5 | 2.9 | 9.7 |
| 79 | | | | | | | | | | | | |
| Average | 4.9 | 3.7 | 3.2 | 3.6 | 3.2 | 4.1 | 5.7 | 5.4 | 5.7 | 5.4 | 5.5 | 6.7 |

Note: Drainage area = 84 $km^2$

TABLE-VII.31 IRRIGATION DIVERSION REQUIREMENT AT CABILOGAN HEADWORKS

(Unit: $m^3/sec$)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 1.8 | 1.1 | 1.0 | 0.4 | 1.0 | 1.8 | 0.6 | 1.0 | 0.1 | 0.0 | 0.4 | 0.3 |
| 57 | 1.1 | 1.8 | 1.3 | 0.3 | 1.3 | 1.4 | 1.1 | 0.4 | 0.4 | 0.0 | 0.6 | 1.5 |
| 58 | 1.5 | 1.7 | 1.3 | 0.4 | 1.1 | 1.5 | 1.3 | 0.8 | 0.3 | 0. | 0.4 | 1.7 |
| 59 | 1.8 | 1.5 | 0.8 | 0.4 | 0.8 | 1.8 | 1.0 | 0.8 | 0.4 | 0.0 | 0.4 | 0.4 |
| 1960 | 1.7 | 1.5 | 1.3 | 0.4 | 1.0 | 1.4 | 1.0 | 0.8 | 0.3 | 0.0 | 0.4 | 1.0 |
| 61 | 2.4 | 2.2 | 1.4 | 0.4 | 1.0 | 1.5 | 0.8 | 0.8 | 0.6 | 0.0 | 0.6 | 1.5 |
| 62 | 1.8 | 1.7 | 1.1 | 0.4 | 0.8 | 1.0 | 0.7 | 1.0 | 0.3 | 0.1 | 0.4 | 1.7 |
| 63 | 2.4 | 1.8 | 1.5 | 0.4 | 1.1 | 1.0 | 1.7 | 0.1 | 0.4 | 0.0 | 0.6 | 1.3 |
| 64 | 1.5 | 1.7 | 1.4 | 0.3 | 1.3 | 1.3 | 1.8 | 1.3 | 0.4 | 0.0 | 0.6 | 0.7 |
| 1965 | 1.8 | 2.0 | 1.5 | 0.4 | 1.3 | 1.8 | 1.4 | 1.8 | 0.8 | 0.1 | 0.7 | 1.5 |
| 66 | 1.1 | 2.0 | 1.3 | 0.4 | 1.0 | 1.7 | 0.8 | 1.5 | 0.6 | 0.0 | 0.4 | 0.6 |
| 67 | 0.6 | 1.5 | 1.1 | 0.4 | 1.3 | 2.0 | 1.0 | 0.7 | 0.1 | 0.0 | 0.7 | 1.7 |
| 68 | 2.0 | 1.7 | 1.5 | 0.4 | 1.0 | 1.4 | 1.0 | 0.8 | 0.3 | 0. | 0.4 | 0.7 |
| 69 | 1.7 | 1.5 | 1.5 | 0.4 | 1.3 | 1.4 | 1.0 | 1.3 | 0.3 | 0.1 | 0.6 | 0.8 |
| 1970 | 1.3 | 1.0 | 1.3 | 0.4 | 1.3 | 2.0 | 0.4 | 0.4 | 0.4 | 0.0 | 0.4 | 1.1 |
| 71 | 1.3 | 1.7 | 1.0 | 0.4 | 0.7 | 1.4 | 0.6 | 1.5 | 0.7 | 0.0 | 0.6 | 0.4 |
| 72 | 2.2 | 1.5 | 1.0 | 0.4 | 1.1 | 1.1 | 0.6 | 0.1 | 0.3 | 0.0 | 0.6 | 1.3 |
| 73 | 2.2 | 2.1 | 1.5 | 0.4 | 1.3 | 2.0 | 1.4 | 1.0 | 0.3 | 0. | 0.4 | 0.6 |
| 74 | 2.0 | 1.3 | 1.4 | 0.4 | 1.1 | 0.6 | 0.4 | 1.7 | 1.0 | 0.0 | 0.4 | 0.8 |
| 1975 | 1.4 | 1.8 | 1.1 | 0.3 | 1.3 | 1.1 | 1.0 | 0.7 | 0.1 | 0.0 | 0.3 | 1.7 |
| 76 | 1.4 | 1.0 | 1.1 | 0.4 | 2.0 | 2.0 | 2.2 | 0.4 | 0.3 | 0.0 | 0.4 | 0.4 |
| 77 | 1.7 | 1.3 | 1.4 | 0.4 | 1.0 | 2.4 | 0.4 | 1.0 | 0.3 | 0.1 | 0.4 | 1.8 |
| 78 | 2.4 | 2.2 | 1.3 | 0.3 | 1.0 | 1.3 | 1.3 | 0.7 | 0.6 | 0.0 | 0.7 | 1.3 |
| 79 | 2.4 | 2.2 | 1.5 | 0.3 | 1.1 | 1.3 | 1.1 | 1.4 | 0. | 0.1 | 0.6 | 1.4 |
| Average | 1.7 | 1.7 | 1.3 | 0.4 | 1.1 | 1.5 | 1.0 | 0.9 | 0.4 | 0.0 | 0.5 | 1.1 |

Note: Net irrigation area = 1,400 ha

TABLE-VII.32 IRRIGATION DIVERSION REQUIREMENT AT SOUTH QUINALI HEADWORKS

(Unit: $m^3/sec$)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 4.1 | 1.8 | 2.0 | 1.0 | 2.5 | 4.1 | 0. | 1.6 | 0. | 0.1 | 1.0 | 0. |
| 57 | 2.0 | 4.0 | 2.8 | 0.5 | 3.4 | 2.9 | 1.7 | 0. | 0.4 | 0. | 1.2 | 3.8 |
| 58 | 3.1 | 3.4 | 2.6 | 1.2 | 2.8 | 3.4 | 2.2 | 1.0 | 0. | 0. | 1.2 | 4.2 |
| 59 | 3.8 | 3.2 | 1.5 | 1.1 | 2.2 | 4.4 | 1.5 | 1.1 | 0.4 | 0. | 0.9 | 0.4 |
| 1960 | 3.4 | 3.4 | 2.9 | 1.0 | 2.6 | 3.0 | 1.6 | 1.1 | 0.2 | 0. | 1.2 | 1.7 |
| 61 | 5.7 | 5.4 | 3.1 | 1.1 | 2.3 | 3.2 | 1.1 | 1.2 | 0.9 | 0. | 1.5 | 3.6 |
| 62 | 3.8 | 3.5 | 2.5 | 1.1 | 1.8 | 1.7 | 0.5 | 1.3 | 0. | 0.2 | 1.1 | 4.1 |
| 63 | 5.8 | 4.2 | 3.8 | 1.2 | 2.9 | 1.6 | 3.5 | 0. | 0.5 | 0.1 | 1.4 | 2.8 |
| 64 | 3.0 | 3.8 | 3.1 | 0.7 | 3.3 | 2.7 | 4.0 | 2.4 | 0.4 | 0.0 | 1.2 | 1.0 |
| 1965 | 4.2 | 4.5 | 3.6 | 1.1 | 3.2 | 4.1 | 2.5 | 4.0 | 1.6 | 0.2 | 1.7 | 3.6 |
| 66 | 1.7 | 4.6 | 2.9 | 1.1 | 2.6 | 3.9 | 1.1 | 3.0 | 0.9 | 0.0 | 1.1 | 0.4 |
| 67 | 0.2 | 3.2 | 2.5 | 0.9 | 3.3 | 4.6 | 1.2 | 0.7 | 0. | 0.1 | 1.7 | 4.3 |
| 68 | 4.3 | 3.6 | 3.6 | 1.2 | 2.6 | 3.0 | 1.6 | 1.1 | 0.2 | 0. | 1.2 | 1.1 |
| 69 | 3.4 | 3.2 | 3.8 | 1.2 | 3.2 | 3.0 | 1.2 | 2.2 | 0.0 | 0.2 | 1.4 | 1.5 |
| 1970 | 2.3 | 1.5 | 2.7 | 1.0 | 3.3 | 4.6 | 0. | 0. | 0.3 | 0. | 0.9 | 2.4 |
| 71 | 2.0 | 3.5 | 1.7 | 0.9 | 1.5 | 3.1 | 0.3 | 3.2 | 1.3 | 0. | 1.5 | 0.4 |
| 72 | 5.5 | 3.3 | 1.7 | 1.1 | 2.9 | 2.2 | 0.2 | 0. | 0.2 | 0.1 | 1.2 | 2.9 |
| 73 | 5.4 | 4.9 | 3.5 | 1.2 | 3.3 | 4.6 | 2.6 | 1.5 | 0. | 0. | 0.9 | 0.4 |
| 74 | 4.6 | 2.4 | 3.4 | 1.1 | 3.0 | 0.5 | 0. | 3.4 | 2.1 | 0. | 1.1 | 1.3 |
| 1975 | 2.5 | 4.0 | 2.2 | 0.5 | 3.4 | 2.1 | 1.5 | 0.5 | 0. | 0.0 | 0.7 | 4.0 |
| 76 | 2.4 | 1.3 | 2.6 | 1.0 | 1.7 | 0.7 | 5.5 | 0. | 0.1 | 0.1 | 0.8 | 0.4 |
| 77 | 3.5 | 2.3 | 3.2 | 1.1 | 2.6 | 5.8 | 0. | 1.5 | 0. | 0.2 | 1.2 | 4.4 |
| 78 | 5.6 | 5.2 | 2.6 | 0.8 | 2.6 | 2.5 | 2.2 | 0.8 | 0.7 | 0. | 1.8 | 2.6 |
| 79 | 5.6 | 5.2 | 3.8 | 0.4 | 3.1 | 2.7 | 1.7 | 2.8 | 0. | 0.2 | 1.3 | 3.2 |
| Average | 3.7 | 3.6 | 2.8 | 1.0 | 2.8 | 3.1 | 1.6 | 1.4 | 0.4 | 0.1 | 1.2 | 2.3 |

Note: Net irrigation area = 4,350 ha

TABLE-VII.33 IRRIGATION DIVERSION REQUIREMENT AT QUINALI HEADWORKS

(Unit: $m^3/sec$)

| | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 0.8 | 0.5 | 0.4 | 0.2 | 0.4 | 0.8 | 0.2 | 0.4 | 0.1 | 0.0 | 0.2 | 0.1 |
| 57 | 0.5 | 0.8 | 0.5 | 0.1 | 0.6 | 0.6 | 0.5 | 0.2 | 0.2 | 0.0 | 0.2 | 0.7 |
| 58 | 0.7 | 0.7 | 0.5 | 0.2 | 0.5 | 0.7 | 0.5 | 0.4 | 0.1 | 0. | 0.2 | 0.7 |
| 59 | 0.8 | 0.7 | 0.4 | 0.2 | 0.4 | 0.8 | 0.4 | 0.4 | 0.2 | 0.0 | 0.2 | 0.2 |
| 1960 | 0.7 | 0.7 | 0.6 | 0.2 | 0.4 | 0.6 | 0.4 | 0.4 | 0.1 | 0.0 | 0.2 | 0.4 |
| 61 | 1.0 | 1.0 | 0.6 | 0.2 | 0.4 | 0.6 | 0.4 | 0.4 | 0.2 | 0.0 | 0.2 | 0.7 |
| 62 | 0.8 | 0.7 | 0.5 | 0.2 | 0.3 | 0.4 | 0.3 | 0.4 | 0.1 | 0.0 | 0.2 | 0.7 |
| 63 | 1.0 | 0.8 | 0.7 | 0.2 | 0.5 | 0.4 | 0.7 | 0.0 | 0.2 | 0.0 | 0.2 | 0.5 |
| 64 | 0.6 | 0.7 | 0.6 | 0.1 | 0.5 | 0.6 | 0.8 | 0.5 | 0.2 | 0.0 | 0.2 | 0.3 |
| 1965 | 0.8 | 0.8 | 0.7 | 0.2 | 0.5 | 0.8 | 0.6 | 0.8 | 0.3 | 0.0 | 0.3 | 0.7 |
| 66 | 0.5 | 0.9 | 0.6 | 0.2 | 0.4 | 0.7 | 0.4 | 0.6 | 0.2 | 0.0 | 0.2 | 0.2 |
| 67 | 0.3 | 0.7 | 0.5 | 0.2 | 0.5 | 0.8 | 0.4 | 0.3 | 0.0 | 0.0 | 0.3 | 0.7 |
| 68 | 0.8 | 0.7 | 0.6 | 0.2 | 0.4 | 0.6 | 0.4 | 0.4 | 0.1 | 0. | 0.2 | 0.3 |
| 69 | 0.7 | 0.7 | 0.7 | 0.2 | 0.5 | 0.6 | 0.4 | 0.5 | 0.1 | 0.0 | 0.2 | 0.4 |
| 1970 | 0.5 | 0.4 | 0.5 | 0.2 | 0.5 | 0.8 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 | 0.5 |
| 71 | 0.5 | 0.7 | 0.4 | 0.2 | 0.3 | 0.6 | 0.3 | 0.7 | 0.3 | 0.0 | 0.3 | 0.2 |
| 72 | 1.0 | 0.7 | 0.4 | 0.2 | 0.5 | 0.5 | 0.3 | 0.1 | 0.1 | 0.0 | 0.2 | 0.6 |
| 73 | 1.0 | 0.9 | 0.6 | 0.2 | 0.5 | 0.8 | 0.6 | 0.4 | 0.1 | 0. | 0.2 | 0.2 |
| 74 | 0.9 | 0.6 | 0.6 | 0.2 | 0.5 | 0.3 | 0.2 | 0.7 | 0.4 | 0.0 | 0.2 | 0.3 |
| 1975 | 0.6 | 0.8 | 0.5 | 0.1 | 0.5 | 0.5 | 0.4 | 0.3 | 0.1 | 0.0 | 0.1 | 0.7 |
| 76 | 0.6 | 0.4 | 0.5 | 0.2 | 0.3 | 0.3 | 1.0 | 0.2 | 0.1 | 0.0 | 0.2 | 0.2 |
| 77 | 0.7 | 0.6 | 0.6 | 0.2 | 0.4 | 1.0 | 0.2 | 0.4 | 0.1 | 0.0 | 0.2 | 0.8 |
| 78 | 1.0 | 0.9 | 0.5 | 0.1 | 0.4 | 0.5 | 0.5 | 0.3 | 0.2 | 0.0 | 0.3 | 0.5 |
| 79 | 1.0 | 1.0 | 0.7 | 0.1 | 0.5 | 0.6 | 0.5 | 0.6 | 0. | 0.0 | 0.2 | 0.6 |
| Average | 0.7 | 0.7 | 0.5 | 0.2 | 0.5 | 0.6 | 0.4 | 0.4 | 0.2 | 0.0 | 0.2 | 0.5 |

Note: Net irrigation area = 600 ha

TABLE-VII.34 IRRIGATION DIVERSION REQUIREMENT AT BANTAYAN HEADWORKS (Unit: $m^3/sec$)

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1956 | 0 | 0 | 0 | 0 | 0.9 | 2.6 | 1.4 | 0.4 | 0 | 0 | 0.6 | 0.1 |
| 57 | 0 | 1.2 | 0.5 | 0.2 | 1.5 | 2.1 | 1.6 | 0.5 | 0.2 | 0 | 0.6 | 0.7 |
| 58 | 0 | 0 | 0 | 0.4 | 1.2 | 2.2 | 1.3 | 0 | 0.4 | 0 | 0.5 | 0.9 |
| 59 | 0.1 | 0 | 0 | 0.6 | 1.2 | 2.1 | 1.1 | 1.5 | 0.6 | 0 | 0.6 | 0.1 |
| 1960 | 1.4 | 0.6 | 1.4 | 0.1 | 1.1 | 2.0 | 2.5 | 0.9 | 0 | 0 | 0.5 | 0.5 |
| 61 | 1.4 | 2.0 | 0.9 | 0.1 | 1.5 | 1.9 | 2.5 | 0.5 | 0.5 | 0 | 0.6 | 0.6 |
| 62 | 0.2 | 0.1 | 0.9 | 0.4 | 0.9 | 3.1 | 1.1 | 0.4 | 0 | 0.1 | 0.6 | 0.9 |
| 63 | 0.7 | 0 | 1.6 | 0.5 | 1.4 | 1.2 | 1.4 | 0 | 0.5 | 0 | 0.6 | 0.5 |
| 64 | 0 | 0 | 1.3 | 0 | 1.4 | 2.1 | 2.2 | 1.1 | 0 | 0 | 0.6 | 0.1 |
| 1965 | 0 | 0 | 0.1 | 0.4 | 1.2 | 2.0 | 0.1 | 0.1 | 0.4 | 0 | 0.6 | 0.2 |
| 66 | 0 | 0.8 | 0.6 | 0.4 | 1.4 | 3.2 | 0.1 | 1.9 | 0.7 | 0 | 0.6 | 0.1 |
| 67 | 0 | 0 | 0 | 0.2 | 1.9 | 2.7 | 2.0 | 0.5 | 0.6 | 0 | 0.5 | 0.6 |
| 68 | 0 | 0.7 | 0.9 | 0.5 | 2.1 | 3.3 | 1.1 | 0.7 | 0 | 0.1 | 0.6 | 1.4 |
| 69 | 2.6 | 2.4 | 1.4 | 0.2 | 1.8 | 2.7 | 1.4 | 1.2 | 0.1 | 0.1 | 0.6 | 0.1 |
| 1970 | 0.2 | 0 | 0 | 0.1 | 1.8 | 1.8 | 1.3 | 0.9 | 0.1 | 0 | 0.5 | 0.4 |
| 71 | 0 | 0 | 0 | 0.2 | 0.9 | 1.5 | 0 | 1.6 | 0.7 | 0 | 0.6 | 0.1 |
| 72 | 0 | 0.8 | 0 | 0.5 | 1.8 | 1.2 | 1.4 | 0 | 0.6 | 0 | 0.6 | 0.5 |
| 73 | 0.4 | 0.7 | 1.5 | 0.4 | 1.5 | 1.5 | 0 | 0 | 0 | 0 | 0.5 | 0.1 |
| 74 | 0.4 | 0 | 1.1 | 0.5 | 1.5 | 0.8 | 0.8 | 1.6 | 0.2 | 0 | 0.6 | 0.2 |
| 1975 | 0 | 0 | 1.9 | 0 | 1.6 | 1.4 | 0.5 | 0.6 | 0 | 0 | 0.7 | 0.1 |
| 76 | 1.8 | 0 | 0 | 0.1 | 0.9 | 1.1 | 0.9 | 0.2 | 0.5 | 0 | 0.6 | 0.1 |
| 77 | 0.4 | 0 | 0.8 | 0.2 | 1.1 | 2.1 | 0.2 | 0.6 | 0 | 0 | 0.5 | 1.1 |
| 78 | 1.8 | 0.4 | 0.4 | 0.2 | 1.2 | 0.8 | 0.8 | 0 | 0 | 0 | 0.6 | 0.4 |
| 79 | 1.2 | 0.9 | 2.1 | 0.1 | 1.4 | 1.2 | 1.1 | 1.5 | 0 | 0 | 0.6 | 0.6 |
| Average | 0.5 | 0.4 | 0.7 | 0.3 | 1.4 | 1.9 | 1.1 | 0.6 | 0.3 | 0.01 | 0.6 | 0.4 |

Note: Net Irrigation Area = 2,400 ha

## TABLE-VII.35 MAXIMUM IRRIGABLE AREA

| Name of Scheme | Irrigable Area (ha) Gross | Net |
|---|---|---|
| Quinali (A) River basin | | |
| i) Cabilogan Scheme | 1,600 | 1,400 |
| ii) Agos Sta. Cruz - South Quinali Scheme | 4,850 | 4,350 |
| iii) Quinali Scheme | 700 | 600 |
| Quinali (B) River basin | | |
| iv) Bantayan Scheme | 2,700 | 2,400 |

## TABLE-VII.36 IRRIGATION WATER SHORTAGE

| Scheme | Irrigation Water Shortage 1/ Annual Max. | | 2-year Max. | | 23 years Total | |
|---|---|---|---|---|---|---|
| | $10^6 m^3$ | (%) | $10^6 m^3$ | (%) | $10^6 m^3$ | (%) |
| i) Cabilogan 2/ | 2.3 | (18.2) | 2.3 | ( 5.2) | 2.3 | ( 0.1) |
| ii) Agos Sta. Cruz - South Auinali 3/ | 20.0 | (27.6) | 24.7 | (15.7) | 98.3 | ( 6.8) |
| iii) Quinali 4/ | 1.7 | (13.7) | 1.7 | ( 6.9) | 4.0 | ( 0.1) |
| iv) Bantayan 5/ | 3.9 | (18.8) | 6.9 | (18.2) | 12.0 | ( 2.6) |

Note: 1/: Shortage in volume ($10^6 m^3$) or percentage to the irrigation diversion requirements,

2/: Table-VII.22 minus Table-VII.31,

3/: Table-VII.28 minus Table-VII.32,

4/: Table-VII.29 minus Table-VII.33, and

5/: Table-VII.30 minus Table-VII.34.

TABLE-VIII.1 ESTIMATED PROPORTION OF HOUSES

(unit : %)

| Municipality | Type A | Type B | Type C |
|---|---|---|---|
| Polangui | 10 | 20 | 10 |
| Libon | 10 | 30 | 50 |
| Oas | 10 | 30 | 60 |
| Ligao | 10 | 40 | 50 |
| Guinobatan | 10 | 20 | 70 |
| Camalig | 10 | 40 | 50 |
| Daraga | 20 | 30 | 50 |
| Legazpi City | 20 | 50 | 30 |
| Sto. Domingo | 10 | 40 | 50 |
| Bacacay | 10 | 40 | 50 |
| Malilipot | 10 | 40 | 50 |
| Tabaco | 10 | 40 | 50 |
| Malinao | 10 | 30 | 60 |

Source : Municipal Socio-Economic and Physical Profile Document

TABLE-VIII.2 INUNDATED BARANGAYS DUE TO FLOOD BY TYPHOON "PEPANG" IN 1979

| River Basin | Municipality | Name of Barangay |
|---|---|---|
| The Quinali (A) River Basin | Polangui | Centro Occidential, Basud, Obaliw, Alomon, Balangibang, Kinali |
| | Libon | Zone 2, Zone 3, Zone 4, Zone 5, Bacolod, Buga, Bulusan, Carisac-East, Carisac-West, Marayag, San-Agustin, San Isidro, Sta Cruz |
| | Oas | Centro Poblacion, Bagumbayan, Bongoran, Busac, Ilaor-Sur, Iraya-Sur, Mayao, Obaliw-Rinas, Rizal, San Agustin, Talongog |
| | Ligao | Bagumbayan, Binatagon, Calzada, Dunao, Guilid, Bobonsuran, Tinago Bonga, Busay, Cavasi, Pandan, Tagpo |
| | Guinobatan | Ilawod, Iraya |
| | Camalig | Ilawod, Ligban, Tagaytay |
| The Yawa River Basin | Daraga | Kilicao, Banag |
| | Legazpi | San Rogue, Houses along Yawa River |
| The Quinali (B) River Basin | Malinao | Balading, Bagumbayan, Balza, Malolos, Libod, Matalipni |

## TABLE-VIII.3 NUMBER OF HOUSES INUNDATED DUE TO FLOOD

(A) 2-Year Probable Flood (Inundation by Typhoon Pepang in 1979)

| Houses \ Inundation Depth(m) | Below Floor Level | Above Floor Level 0 - 0.5 | 0.5 - 1.0 | 1.0 - 2.0 | 2.0 - 3.0 |
|---|---|---|---|---|---|
| The Quinali(A) River Basin | | | | | |
| Type A | 203 | 430 | 369 | 85 | 0 |
| Type B | 670 | 1,378 | 1,096 | 257 | 0 |
| Type C | 1,171 | 2,420 | 2,169 | 548 | 0 |
| The Yawa River Basin | | | | | |
| Type A | 0 | 61 | 62 | 0 | 0 |
| Type B | 0 | 154 | 155 | 0 | 0 |
| Type C | 0 | 92 | 93 | 0 | 0 |
| The Quinali(B) River Basin | | | | | |
| Type A | 54 | 54 | 0 | 0 | 0 |
| Type B | 163 | 163 | 0 | 0 | 0 |
| Type C | 326 | 327 | 0 | 0 | 0 |

(B) 10-Year Probable Flood

| Houses \ Inundation Depth(m) | Below Floor Level | Above Floor Level 0 - 0.5 | 0.5 - 1.0 | 1.0 - 2.0 | 2.0 - 3.0 |
|---|---|---|---|---|---|
| The Quinali(A) River Basin | | | | | |
| Type A | 118 | 265 | 562 | 473 | 0 |
| Type B | 388 | 874 | 1,792 | 1,418 | 0 |
| Type C | 679 | 1,528 | 3,267 | 2,838 | 0 |
| The Yawa River Basin | | | | | |
| Type A | 198 | 123 | 174 | 62 | 0 |
| Type B | 296 | 307 | 436 | 146 | 0 |
| Type C | 494 | 184 | 262 | 101 | 0 |
| The Quinali(B) River Basin | | | | | |
| Type A | 72 | 60 | 54 | 0 | 0 |
| Type B | 215 | 179 | 163 | 0 | 0 |
| Type C | 429 | 356 | 327 | 0 | 0 |

- to be continued -

(C) 20-Year Probable Flood

| Houses \ Inundation Depth(m) | Below Floor Level | Above Floor Level 0 - 0.5 | 0.5 - 1.0 | 1.0 - 2.0 | 2.0 - 3.0 |
|---|---|---|---|---|---|
| **The Quinali(A) River Basin** | | | | | |
| Type A | 241 | 124 | 462 | 799 | 0 |
| Type B | 601 | 427 | 1,491 | 2,274 | 0 |
| Type C | 1,579 | 680 | 2,661 | 4,914 | 0 |
| **The Yawa River Basin** | | | | | |
| Type A | 465 | 75 | 155 | 250 | 10 |
| Type B | 863 | 112 | 356 | 630 | 15 |
| Type C | 1,055 | 186 | 265 | 401 | 25 |
| **The Quinali(B) River Basin** | | | | | |
| Type A | 33 | 38 | 114 | 0 | 0 |
| Type B | 100 | 115 | 342 | 0 | 0 |
| Type C | 199 | 231 | 683 | 0 | 0 |

(D) 50-Year Probable Flood

| Houses \ Inundation Depth(m) | Below Floor Level | Above Floor Level 0 - 0.5 | 0.5 - 1.0 | 1.0 - 2.0 | 2.0 - 3.0 |
|---|---|---|---|---|---|
| **The Quinali(A) River Basin** | | | | | |
| Type A | 161 | 241 | 242 | 1,072 | 72 |
| Type B | 358 | 601 | 826 | 3,366 | 177 |
| Type C | 1,089 | 1,579 | 1,354 | 6,270 | 455 |
| **The Yawa River Basin** | | | | | |
| Type A | 339 | 525 | 107 | 307 | 82 |
| Type B | 678 | 988 | 160 | 768 | 184 |
| Type C | 680 | 1,175 | 267 | 461 | 142 |
| **The Quinali(B) River Basin** | | | | | |
| Type A | 32 | 66 | 76 | 109 | 0 |
| Type B | 97 | 198 | 229 | 326 | 0 |
| Type C | 193 | 396 | 458 | 652 | 0 |

- to be continued -

(E) 100-Year Probable Flood

| Houses \ Innundation Depth(m) | Below Floor Level | Above Floor Level 0 - 0.5 | 0.5 - 1.0 | 1.0 - 2.0 | 2.0 - 3.0 |
|---|---|---|---|---|---|
| The Quinali (A) River Basin | | | | | |
| Type A | 0 | 268 | 173 | 880 | 466 |
| Type B | 0 | 615 | 491 | 2,829 | 1,393 |
| Type C | 0 | 1,785 | 1,065 | 5,096 | 2,800 |
| The Yawa River Basin | | | | | |
| Type A | 0 | 581 | 316 | 321 | 143 |
| Type B | 0 | 1,140 | 575 | 726 | 339 |
| Type C | 0 | 1,213 | 720 | 554 | 235 |
| The Quinali (B) River Basin | | | | | |
| Type A | 0 | 32 | 104 | 147 | 0 |
| Type B | 0 | 97 | 312 | 441 | 0 |
| Type C | 0 | 193 | 624 | 882 | 0 |

## TABLE-VIII.4 ESTIMATED FLOOD DAMAGE TO HOUSES

(Unit: 1,000 pesos)

| Return Period of Flood / River Basin | 2-Year | 10-Year | 20-Year | 50-Year | 100-Year |
|---|---|---|---|---|---|
| The Quinali (A) River Basin | | | | | |
| Houses | 9,937 | 16,891 | 20,272 | 24,876 | 29,539 |
| Establishments (10%) | 994 | 1,689 | 2,027 | 2,488 | 2,954 |
| Sub-Total | 10,931 | 18,580 | 22,299 | 27,364 | 32,493 |
| The Yawa River Basin | | | | | |
| Houses | 1,141 | 4,090 | 7,413 | 11,596 | 13,896 |
| Establishments (10%) | 114 | 409 | 741 | 1,160 | 1,390 |
| Sub-Total | 1,255 | 4,499 | 8,154 | 12,756 | 15,286 |
| The Quinali (B) River Basin | | | | | |
| Houses | 683 | 1,402 | 1,706 | 3,315 | 3,833 |
| Establishments (10%) | 68 | 140 | 171 | 332 | 383 |
| Sub-Total | 751 | 1,542 | 1,877 | 3,647 | 4,216 |
| Total | 12,937 | 24,621 | 32,330 | 43,767 | 51,995 |

Remarks: Amount is estimated at 1979 price level.

TABLE-VIII.5 ESTIMATED DAMAGE TO HOUSES

(2-Year Probable Flood-Typhoon Pepang)

| Name of Basin | Depth Above Floor Level (m) | Type of Dwelling-Unit | No. of Dwelling Unit | Damage Rate | House Value (pesos) | Estimated Damage Cost (pesos) |
|---|---|---|---|---|---|---|
| The Quinali(A) River Basin | Below Floor | Type A | 203 | 0.03 | 80,000 | 487,200 |
| | | Type B | 670 | 0.03 | 20,000 | 402,000 |
| | | Type C | 1,171 | 0.03 | 2,000 | 70,260 |
| | 0 - 0.5 | Type A | 430 | 0.053 | 80,000 | 1,823,200 |
| | | Type B | 1,378 | 0.053 | 20,000 | 1,460,680 |
| | | Type C | 2,420 | 0.053 | 2,000 | 256,520 |
| | 0.5 - 1.0 | Type A | 369 | 0.072 | 80,000 | 2,125,440 |
| | | Type B | 1,096 | 0.072 | 20,000 | 1,578,240 |
| | | Type C | 2,169 | 0.072 | 2,000 | 312,340 |
| | 1.0 - 2.0 | Type A | 85 | 0.109 | 80,000 | 741,200 |
| | | Type B | 257 | 0.109 | 20,000 | 560,260 |
| | | Type C | 548 | 0.109 | 2,000 | 119,460 |
| | | | | | | 9,936,800 |
| The Yawa River Basin | 0 - 0.5 | Type A | 61 | 0.053 | 80,000 | 258,640 |
| | | Type B | 154 | 0.053 | 20,000 | 163,240 |
| | | Type C | 92 | 0.053 | 2,000 | 9,750 |
| | 0.5 - 1.0 | Type A | 62 | 0.072 | 80,000 | 357,120 |
| | | Type B | 155 | 0.072 | 20,000 | 223,200 |
| | | Type C | 93 | 0.072 | 2,000 | 13,390 |
| | Washed out | Type C | 58 | 1.000 | 2,000 | 116,000 |
| | | | | | | 1,141,340 |
| The Quinali(B) River Basin | Below Floor | Type A | 54 | 0.03 | 80,000 | 129,600 |
| | | Type B | 163 | 0.03 | 20,000 | 97,800 |
| | | Type C | 326 | 0.03 | 2,000 | 19,560 |
| | 0 - 0.5 | Type A | 54 | 0.053 | 80,000 | 228,960 |
| | | Type B | 163 | 0.053 | 20,000 | 172,780 |
| | | Type C | 327 | 0.053 | 2,000 | 34,660 |
| | | | | | | 683,360 |

TABLE-VIII.6 ESTIMATED DAMAGE TO HOUSES

(10-Year Probable Flood)

| Name of Basin | Depth Above Floor Level (m) | Type of Dwelling-Unit | No. of Dwelling Unit | Damage Rate | House Value (pesos) | Estimated Damage Cost (pesos) |
|---|---|---|---|---|---|---|
| The Quinali(A) River Basin | Below Floor | Type A | 118 | 0.03 | 80,000 | 283,200 |
| | | Type B | 388 | 0.03 | 20,000 | 232,800 |
| | | Type C | 679 | 0.03 | 2,000 | 40,740 |
| | 0 - 0.5 | Type A | 265 | 0.053 | 80,000 | 1,123,600 |
| | | Type B | 874 | 0.053 | 20,000 | 926,440 |
| | | Type C | 1,528 | 0.053 | 2,000 | 161,970 |
| | 0.5 - 1.0 | Type A | 562 | 0.072 | 80,000 | 3,237,120 |
| | | Type B | 1,792 | 0.072 | 20,000 | 2,580,480 |
| | | Type C | 3,267 | 0.072 | 2,000 | 470,450 |
| | 1.0 - 2.0 | Type A | 473 | 0.109 | 80,000 | 4,124,560 |
| | | Type B | 1,418 | 0.109 | 20,000 | 3,091,240 |
| | | Type C | 2,838 | 0.109 | 2,000 | 618,680 |
| | | | | | | 16,891,280 |
| The Yawa River Basin | Below Floor | Type A | 198 | 0.03 | 80,000 | 475,200 |
| | | Type B | 296 | 0.03 | 20,000 | 177,600 |
| | | Type C | 494 | 0.03 | 2,000 | 29,640 |
| | 0 - 0.5 | Type A | 123 | 0.053 | 80,000 | 521,520 |
| | | Type B | 307 | 0.053 | 20,000 | 325,420 |
| | | Type C | 184 | 0.053 | 2,000 | 19,500 |
| | 0.5 - 1.0 | Type A | 174 | 0.072 | 80,000 | 1,002,240 |
| | | Type B | 431 | 0.072 | 20,000 | 620,640 |
| | | Type C | 262 | 0.072 | 2,000 | 37,730 |
| | 1.0 - 2.0 | Type A | 62 | 0.109 | 80,000 | 540,640 |
| | | Type B | 146 | 0.109 | 20,000 | 318,280 |
| | | Type C | 101 | 0.109 | 2,000 | 22,010 |
| | | | | | | 4,090,420 |
| The Quinali(B) River Basin | Below Floor | Type A | 72 | 0.03 | 80,000 | 172,800 |
| | | Type B | 215 | 0.03 | 20,000 | 129,000 |
| | | Type C | 429 | 0.03 | 2,000 | 25,740 |
| | 0 - 0.5 | Type A | 60 | 0.053 | 80,000 | 254,400 |
| | | Type B | 179 | 0.053 | 20,000 | 189,740 |
| | | Type C | 356 | 0.053 | 2,000 | 37,740 |
| | 0.5 - 1.0 | Type A | 54 | 0.072 | 80,000 | 311,040 |
| | | Type B | 163 | 0.072 | 20,000 | 234,720 |
| | | Type C | 327 | 0.072 | 2,000 | 47,090 |
| | | | | | | 1,402,270 |

TABLE-VIII.7 ESTIMATED DAMAGE TO HOUSES

(20-Year Probable Flood)

| Name of Basin | Depth Above Floor Level (m) | Type of Dwelling-Unit | No. of Dwelling Unit | Damage Rate | House Value (pesos) | Estimated Damage Cost (pesos) |
|---|---|---|---|---|---|---|
| The Quinali(A) River Basin | Below Floor | Type A | 241 | 0.03 | 80,000 | 578,400 |
| | | Type B | 601 | 0.03 | 20,000 | 360,600 |
| | | Type C | 1,597 | 0.03 | 2,000 | 95,820 |
| | 0 - 0.5 | Type A | 124 | 0.053 | 80,000 | 525,760 |
| | | Type B | 427 | 0.053 | 20,000 | 452,620 |
| | | Type C | 680 | 0.053 | 2,000 | 72,080 |
| | 0.5 - 1.0 | Type A | 462 | 0.072 | 80,000 | 2,661,120 |
| | | Type B | 1,491 | 0.072 | 20,000 | 2,147,040 |
| | | Type C | 2,661 | 0.072 | 2,000 | 383,180 |
| | 1.0 - 2.0 | Type A | 799 | 0.109 | 80,000 | 6,967,280 |
| | | Type B | 2,274 | 0.109 | 20,000 | 4,957,320 |
| | | Type C | 4,914 | 0.109 | 2,000 | 1,071,250 |
| | | | | | | 20,272,470 |
| The Yawa River Basin | Below Floor | Type A | 465 | 0.03 | 80,000 | 1,116,000 |
| | | Type B | 863 | 0.03 | 20,000 | 517,800 |
| | | Type C | 1,055 | 0.03 | 2,000 | 63,300 |
| | 0 - 0.5 | Type A | 75 | 0.053 | 80,000 | 318,000 |
| | | Type B | 112 | 0.053 | 20,000 | 118,720 |
| | | Type C | 186 | 0.053 | 2,000 | 19,720 |
| | 0.5 - 1.0 | Type A | 155 | 0.072 | 80,000 | 892,800 |
| | | Type B | 356 | 0.072 | 20,000 | 512,640 |
| | | Type C | 265 | 0.072 | 2,000 | 38,160 |
| | 1.0 - 2.0 | Type A | 250 | 0.109 | 80,000 | 2,180,000 |
| | | Type B | 630 | 0.109 | 20,000 | 1,373,400 |
| | | Type C | 401 | 0.109 | 2,000 | 87,420 |
| | 2.0 - 3.0 | Type A | 10 | 0.152 | 80,000 | 121,600 |
| | | Type B | 15 | 0.152 | 20,000 | 45,600 |
| | | Type C | 25 | 0.152 | 2,000 | 7,600 |
| | | | | | | 7,412,760 |
| The Quinali(B) River Basin | Below Floor | Type A | 33 | 0.03 | 80,000 | 79,200 |
| | | Type B | 100 | 0.03 | 20,000 | 60,000 |
| | | Type C | 199 | 0.03 | 2,000 | 11,940 |
| | 0 - 0.5 | Type A | 38 | 0.053 | 80,000 | 161,120 |
| | | Type B | 115 | 0.053 | 20,000 | 121,900 |
| | | Type C | 231 | 0.053 | 2,000 | 24,490 |
| | 0.5 - 1.0 | Type A | 114 | 0.072 | 80,000 | 656,640 |
| | | Type B | 342 | 0.072 | 20,000 | 492,480 |
| | | Type C | 683 | 0.072 | 2,000 | 98,350 |
| | | | | | | 1,706,120 |

TABLE-VIII.8 ESTIMATED DAMAGE TO HOUSES

(50-Year Probable Flood)

| Name of Basin | Depth Above Floor Level (m) | Type of Dwelling-Unit | No. of Dwelling Unit | Damage Rate | House Value (pesos) | Estimated Damage Cost (pesos) |
|---|---|---|---|---|---|---|
| The Quinali(A) River Basin | Below Floor | Type A | 161 | 0.03 | 80,000 | 386,400 |
| | | Type B | 358 | 0.03 | 20,000 | 214,800 |
| | | Type C | 1,089 | 0.03 | 2,000 | 65,340 |
| | 0 - 0.5 | Type A | 241 | 0.053 | 80,000 | 1,021,840 |
| | | Type B | 601 | 0.053 | 20,000 | 637,060 |
| | | Type C | 1,579 | 0.053 | 2,000 | 167,370 |
| | 0.5 - 1.0 | Type A | 242 | 0.072 | 80,000 | 1,393,920 |
| | | Type B | 826 | 0.072 | 20,000 | 1,189,440 |
| | | Type C | 1,354 | 0.072 | 2,000 | 194,980 |
| | 1.0 - 2.0 | Type A | 1,072 | 0.109 | 80,000 | 9,347,840 |
| | | Type B | 3,366 | 0.109 | 20,000 | 7,337,880 |
| | | Type C | 6,270 | 0.109 | 2,000 | 1,366,860 |
| | 2.0 - 3.0 | Type A | 72 | 0.152 | 80,000 | 875,520 |
| | | Type B | 177 | 0.152 | 20,000 | 538,080 |
| | | Type C | 455 | 0.152 | 2,000 | 138,320 |
| | | | | | | 24,875,650 |
| The Yawa River Basin | Below Floor | Type A | 339 | 0.03 | 80,000 | 813,600 |
| | | Type B | 678 | 0.03 | 20,000 | 406,800 |
| | | Type C | 680 | 0.03 | 2,000 | 40,800 |
| | 0 - 0.5 | Type A | 525 | 0.053 | 80,000 | 2,226,000 |
| | | Type B | 988 | 0.053 | 20,000 | 1,047,280 |
| | | Type C | 1,175 | 0.053 | 2,000 | 124,550 |
| | 0.5 - 1.0 | Type A | 107 | 0.072 | 80,000 | 616,320 |
| | | Type B | 160 | 0.072 | 20,000 | 230,400 |
| | | Type C | 267 | 0.072 | 2,000 | 38,450 |
| | 1.0 - 2.0 | Type A | 307 | 0.109 | 80,000 | 2,677,040 |
| | | Type B | 768 | 0.109 | 20,000 | 1,674,240 |
| | | Type C | 461 | 0.109 | 2,000 | 100,500 |
| | 2.0 - 3.0 | Type A | 82 | 0.152 | 80,000 | 997,120 |
| | | Type B | 184 | 0.152 | 20,000 | 559,360 |
| | | Type C | 142 | 0.152 | 2,000 | 43,170 |
| | | | | | | 11,595,630 |
| The Quinali(B) River Basin | Below Floor | Type A | 32 | 0.03 | 80,000 | 76,800 |
| | | Type B | 97 | 0.03 | 20,000 | 58,200 |
| | | Type C | 193 | 0.03 | 2,000 | 11,580 |
| | 0 - 0.5 | Type A | 66 | 0.053 | 80,000 | 279,840 |
| | | Type B | 198 | 0.053 | 20,000 | 209,880 |
| | | Type C | 396 | 0.053 | 2,000 | 41,980 |
| | 0.5 - 1.0 | Type A | 76 | 0.072 | 80,000 | 437,760 |
| | | Type B | 229 | 0.072 | 20,000 | 329,760 |
| | | Type C | 458 | 0.072 | 2,000 | 65,950 |
| | 1.0 - 2.0 | Type A | 109 | 0.109 | 80,000 | 950,480 |
| | | Type B | 326 | 0.109 | 20,000 | 710,680 |
| | | Type C | 652 | 0.109 | 2,000 | 142,140 |
| | | | | | | 3,315,050 |

TABLE-VIII.9 ESTIMATED DAMAGE TO HOUSES

(100-Year Probable Flood)

| Name of Basin | Depth Above Floor Level (m) | Type of Dwelling-Unit | No. of Dwelling Unit | Damage Rate | House Value (pesos) | Estimated Damage Cost (pesos) |
|---|---|---|---|---|---|---|
| The Quinali(A) River Basin | 0 - 0.5 | Type A | 268 | 0.053 | 80,000 | 1,136,320 |
| | | Type B | 615 | 0.053 | 20,000 | 651,900 |
| | | Type C | 1,785 | 0.053 | 2,000 | 189,210 |
| | 0.5 - 1.0 | Type A | 173 | 0.072 | 80,000 | 996,480 |
| | | Type B | 491 | 0.072 | 20,000 | 707,040 |
| | | Type C | 1,065 | 0.072 | 2,000 | 153,360 |
| | 1.0 - 2.0 | Type A | 880 | 0.109 | 80,000 | 7,673,600 |
| | | Type B | 2,829 | 0.109 | 20,000 | 6,167,220 |
| | | Type C | 5,096 | 0.109 | 2,000 | 1,110,930 |
| | 2.0 - 3.0 | Type A | 466 | 0.152 | 80,000 | 5,666,560 |
| | | Type B | 1,393 | 0.152 | 20,000 | 4,234,720 |
| | | Type C | 2,800 | 0.152 | 2,000 | 851,200 |
| | | | | | | 29,538,540 |
| The Yawa River Basin | 0 - 0.5 | Type A | 581 | 0.053 | 80,000 | 2,463,440 |
| | | Type B | 1,140 | 0.053 | 20,000 | 1,208,400 |
| | | Type C | 1,213 | 0.053 | 2,000 | 128,580 |
| | 0.5 - 1.0 | Type A | 316 | 0.072 | 80,000 | 1,820,160 |
| | | Type B | 575 | 0.072 | 20,000 | 828,000 |
| | | Type C | 720 | 0.072 | 2,000 | 103,680 |
| | 1.0 - 2.0 | Type A | 321 | 0.109 | 80,000 | 2,799,120 |
| | | Type B | 726 | 0.109 | 20,000 | 1,582,680 |
| | | Type C | 554 | 0.109 | 2,000 | 120,770 |
| | 2.0 - 3.0 | Type A | 143 | 0.152 | 80,000 | 1,738,880 |
| | | Type B | 339 | 0.152 | 20,000 | 1,030,560 |
| | | Type C | 235 | 0.152 | 2,000 | 71,440 |
| | | | | | | 13,895,710 |
| The Quinali(B) River Basin | 0 - 0.5 | Type A | 32 | 0.053 | 80,000 | 135,680 |
| | | Type B | 97 | 0.053 | 20,000 | 102,820 |
| | | Type C | 193 | 0.053 | 2,000 | 20,460 |
| | 0.5 - 1.0 | Type A | 104 | 0.072 | 80,000 | 599,040 |
| | | Type B | 312 | 0.072 | 20,000 | 449,280 |
| | | Type C | 624 | 0.072 | 2,000 | 89,860 |
| | 1.0 - 2.0 | Type A | 147 | 0.109 | 80,000 | 1,281,840 |
| | | Type B | 441 | 0.109 | 20,000 | 961,380 |
| | | Type C | 882 | 0.109 | 2,000 | 192,280 |
| | | | | | | 3,832,640 |

TABLE-VIII.10 ESTIMATED DAMAGE COST ON THE NATIONAL ROAD

(Unit: Pesos)

| Date and Typhoon | The Quinali(A) River Basin | The Yawa River Basin | East North-East Area | The Quinali(B) River Basin | Total Damage Cost |
|---|---|---|---|---|---|
| Typhoon 'Pepang' Sep. 1979 | 722,500 | 30,000<br>500 | 46,000 | 47,000 | 816,000 |
| Typhoon 'Kading' Oct. 1978 | 351,000 | 0 | 0 | 45,000 | 396,000 |
| Typhoon 'Weling' Sep. 1978 | 350,000 | 96,000<br>0 | 0 | 45,000 | 395,000 |
| Typhoon 'Yaning' Oct. 1978 | | 96,000 | | | |
| Typhoon 'Unding' Nov. 1977 | 1,500,000 | 0 | 0 | 204,000 | 1,704,000 |
| Typhoon 'Goring' July 1977 | | 27,000 | | | |
| Typhoon 'Didang' May 1976 | Not available | 0 | 0 | 0 | Not available |
| Typhoon 'Sisang' Dec. 1975 | 800,000 | 0 | 150,000 | 51,000 | 1,001,000 |
| Heavy Rainfall Dec. 1975 | 365,000 | 0 | 60,000 | 0 | 425,000 |

Remarks: Data Source - The Ministry of Public Highway and City Engineering Office (Legazpi City, marked in under line).

Amount - Damage costs are based on the price level in each year.

TABLE-VIII.11 ESTIMATED DAMAGE COST ON THE PROVINCIAL ROAD

(Unit: Pesos)

| Date and Typhoon | The Quinali(A) River Basin | The Yawa River Basin | East North-East Area | The Quinali(B) River Basin | Total Damage Cost |
|---|---|---|---|---|---|
| Typhoon 'Pepang' Sep. 1979 | 103,900 | 45,000 | 26,000 | 121,500 | 296,400 |
| Typhoon 'Sisang' Dec. 1975 | 368,800 | 30,000 | 150,000 | 45,000 | 593,800 |

Remarks: Data Source - Provincial Engineering Office.

Amount - Damage costs are based on the price level in each year.

TABLE-VIII.12 ESTIMATED DAMAGE COST ON THE MUNICIPAL AND CITY ROAD

(Unit: Pesos)

| Date and Typhoon | The Quinali(A) River Basin | The Yawa River Basin | East North-East Area | The Quinali(B) River Basin | Total Damage Cost |
|---|---|---|---|---|---|
| Typhoon'Pepang' Sep. 1979 | | 40,000 | | | 40,000 |
| Typhoon'Kading' Oct. 1978 | | 35,000 | | | 35,000 |
| Typhoon'Yaning' Oct. 1978 | | 40,000 | | | 40,000 |
| Typhoon'Weling' Sep. 1978 | | 30,000 | | | 30,000 |
| Typhoon'Heling' Aug. 1978 | | 20,000 | | | 20,000 |
| Typhoon'Unding' Nov. 1977 | 302,200 | 27,000<br>35,000 | 220,700 | 43,700 | 629,100 |
| Typhoon'Tasing' Nov. 1977 | | 10,000 | | | 10,000 |
| Typhoon'Luming & Miling' Sept. Sep. 1977 | 52,600 | 4,500<br>10,000 | 39,800 | 7,000 | 113,900 |
| Typhoon'Goring' July 1977 | | 15,000 | | | 15,000 |
| Typhoon'Elang' July 1977 | 52,500 | 4,500 | 39,800 | 5,100 | 101,900 |
| Typhoon'Aring' Dec. 1976 | | 18,000 | | | 18,000 |
| Typhoon'Pidang' May 1976 | 52,500 | 4,500<br>10,000 | 39,700 | 5,100 | 111,800 |
| Typhoon'Sisang' Dec. 1975 | | 170,000 | | | 170,000 |
| Typhoon'Mameng & Neneng Oct. 1975 | | 70,000 | | | 70,000 |
| Typhoon'Diding' Aug. 1975 | | 40,000 | | | 40,000 |

Remarks: Data Source - 13 - Municipalities and City Engineering Office (Legazpi City, marked in under line).

Amount - Damage costs are based on the price level in each year.

TABLE-VIII.13 ESTIMATED DAMAGE COST ON THE BARANGAY ROAD

(Unit: Pesos)

| Date and Typhoon | The Quinali(A) River Basin | The Yawa River Basin | East North-East Area | The Quinali(B) River Basin | Total Damage Cost |
|---|---|---|---|---|---|
| Typhoon'Pepgang' Sep. 1979 | | 210,000 | | | |
| Typhoon'Bebing' Apr. 1979 | 7,500 | 67,500 | 330,000 | 300,000 | 705,000 |
| Typhoon'Kading' Oct. 1978 | | 100,000 | | | |
| Typhoon'Yaning' Oct. 1978 | 187,500 | 27,500 | 178,000 | 155,000 | 548,000 |
| Typhoon'Weling' Sep. 1978 | 311,500 | 109,500 | 142,000 | 76,000 | 639,000 |
| Typhoon'Heling' Aug. 1978 | 328,500 | 33,500 | 133,000 | 85,000 | 580,000 |
| Typhoon'Luming&Miling' Sep. 1977 | 76,500 | 8,500 | 209,000 | 69,000 | 363,000 |
| Typhoon'Unding' Nov. 1977 | 323,500 | 75,000<br>33,500 | 135,000 | 90,000 | 657,000 |
| Typhoon'Tasing' Nov. 1977 | | 40,000 | | | |
| Typhoon'Goring' July 1977 | 119,500 | 50,000<br>8,500 | 228,000 | 71,000 | 477,000 |
| Typhoon'Luming&Miling' Sep. 1977 | | 65,000 | | | |
| Typhoon'Elang' July 1977 | 102,500 | 8,500 | 158,000 | 53,000 | 322,000 |
| Typhoon'Aring' Dec. 1976 | 168,500 | 55,000<br>12,500 | 296,000 | 81,000 | 613,000 |
| Typhoon'Didang' May 1976 | 170,000 | 70,000<br>10,000 | 137,000 | 20,000 | 407,000 |
| Typhoon'Huaning' June 1976 | 160,000 | 10,000 | 127,000 | 30,000 | 327,000 |
| Typhoon'Sisang' Dec. 1975 | 100,000 | 10,000 | 95,000 | 30,000 | 235,000 |

Remarks: Data source - The Ministry of Public Highway and City Engineering Office (Legazpi City, marked in under line).
Amount - Damage Costs are based on the price level in each year.

TABLE-VIII.14 ESTIMATED DAMAGE COST TO RAILWAY TRACKS AND BRIDGES

| Location | | Description of Damages | Cost of Repair | | Remarks |
|---|---|---|---|---|---|
| T.P. NO. | Bet. Station | | Temporary | Permanent | |
| 8735 - 36 | Apad - Polangui | One span permanent bridge damaged | 30,000 | 60,000 | Damaged(1975), Estimated(1976) |
| 8770 - 90 | Polangui - Ligao | Track washed out | NA | 3,000 | Damaged(1975), Estimated(1976) |
| 8776 - 77 | Polangui - Oas | South approach of 4 spans temp. bridge eroded | 10,000 | 190,000 | Damaged(1975), Estimated(1976) Permanent repair not undertaken |
| 8783 - 84 | Polangui - Oas | Track eroded | 15,000 | 100,000 | - do - |
| 8823 - 24 | Oas - Ligao | North approach of 6 spans temp. bridge washed out | 30,000 | 260,000 | - do - |
| 8831 - 32 | Oas - Ligao | Track eroded | NA | 3,000 | - do - |
| 8881 - 82 | Oas - Ligao | North approach of Temp. bridge eroded | 7,000 | (4,210,000) | Damaged(1975), Cost for temp. estimate(1976), cost for permanent estimated(1980). Construction of permanent bridge, protection works, estimates and pertinent papers forwarded to the MPW for founding. |
| 8881 - 82 | Oas - Ligao | 9 spans temp. bridge washed out | 320,000 | 320,000 | Damaged(1979), Estimated(1979) |
| 9090 - 91 | Guinobatan -Camalig | Both cap of the 3rd bent from South collapsed | NA | 5,000 | Damaged(1975), Estimated(1976) |
| 9197 - 78 | Guinobatan -Camalig | South approach of bridge washed out 2m x ½ m deep. Left side of North approach eroded | NA | 5,000 | - do - |

- continued -

| Location | | Description of Damages | Cost of Repair | | Remarks |
|---|---|---|---|---|---|
| T.P. No. | Bet. Station | | Temporary | Permanent | |
| 9205 - 07 | Guinobatan -Camalig | 80m length of track was covered with sand about 1 foot deep | NA | 1,000 | - do - |
| 9352 - 53 | Camalig - Daraga | 1 span perm. bridge DPG 49'-0" long fell | 70,000 | 150,000 | Damaged(1975), Estimated(1976) With the construction of the Camalig - Daraga line in full blast, permanent repair in this section is no longer considered. |
| 9364 - 65 | Camalig - Daraga | 1 span perm. bridge TL100'-9" long fell | 175,000 | 800,000 | - do - |
| 9407 - 08 | Camalig - Daraga | 1 span perm. bridge DPG49'-0" long, heavily damaged | 70,000 | 150,00 | - do - |
| 9276 - 9368 | Camalig - Legazpi | 12 temp. bridges in various locations totalling 104 spans washed out | NA | 2,600,000 | - do - |

Remarks: Temporary means only possible transportation except the reconstruction of minor damages.
Permanent means the estimated damage costs to reconstruct completely.