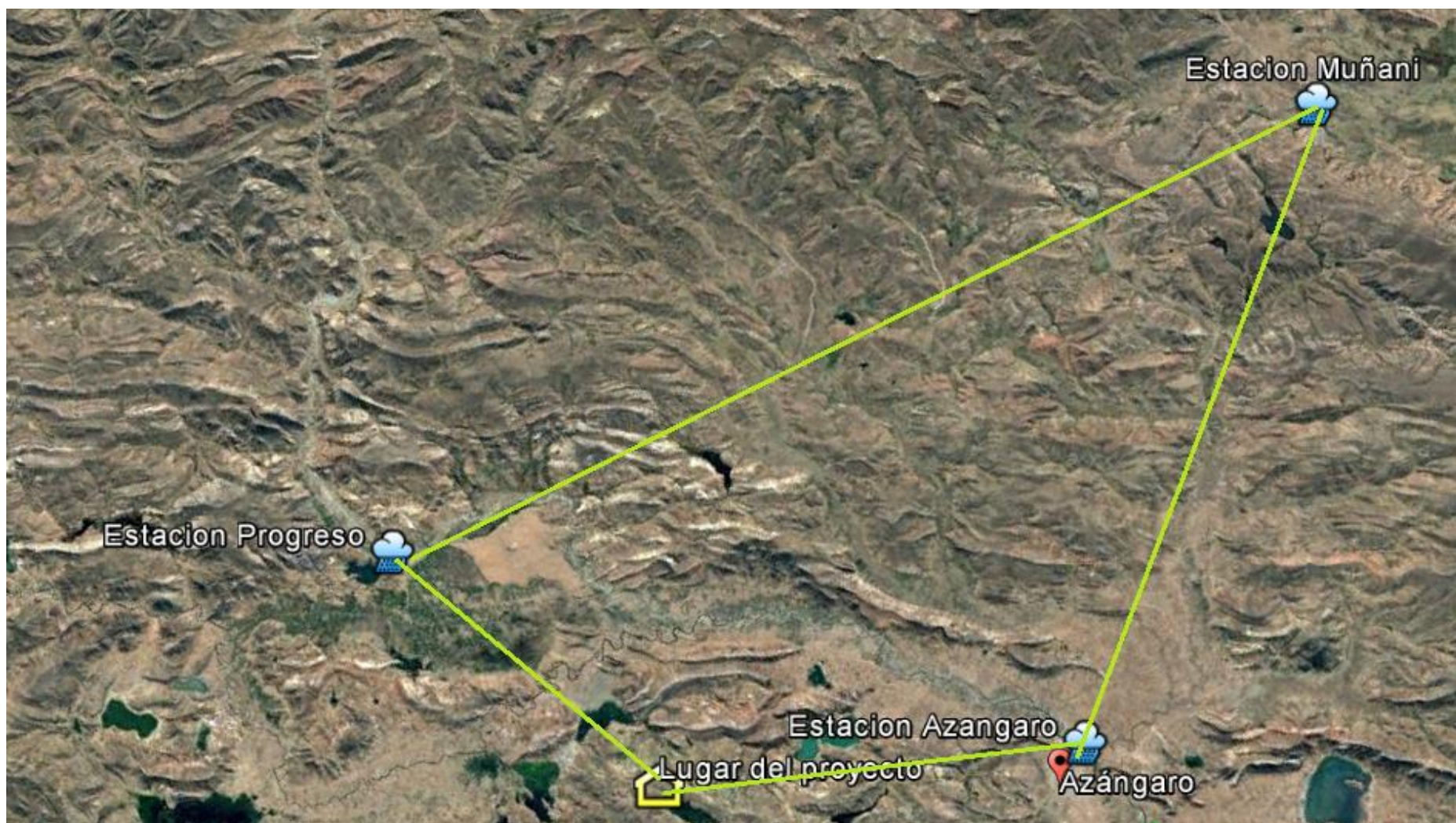


ESTACIONES CONSIDERADAS PARA LAS PRECIPITACIONES



PRECIPITACION MAXIMA EN 24 Hrs. HISTORICA (mm)

NOMBRE : AZANGARO

CUENCA

LATITUD : 14°54'51.7"

REGION : PUNO

CODIGO : 110781

LONGITUD : 70°11'26.7"

PROV : AZANGARO

TIPO : CO

ALTITUD : 3863 MSNM

DIST : AZANGARO

AÑO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	MAX
1964	17.0	16.0	21.5	19.5	10.5	0.0	0.0	0.5	19.0	8.5	8.5	15.0	21.50
1965	15.5	23.5	17.5	13.0	0.5	0.0	0.0	2.0	9.5	9.8	11.5	31.5	31.50
1966	18.0	37.0	22.6	16.5	14.5	0.0	0.0	1.5	17.2	10.0	13.6	24.8	37.00
1967	8.8	22.5	28.8	3.3	6.2	0.0	8.2	10.3	8.0	16.4	3.2	28.8	28.80
1968	12.7	14.9	14.0	8.2	0.5	1.0	8.0	4.5	11.9	6.0	13.3	8.8	14.90
1969	22.5	13.0	10.0	10.2	0.0	0.7	12.0	1.0	9.6	4.8	8.2	12.0	22.50
1970	36.4	8.8	19.2	17.7	5.4	0.0	0.0	0.0	12.8	14.8	21.8	22.6	36.40
1971	17.2	62.9	9.9	10.2	0.5	0.5	0.3	5.2	4.9	6.1	20.0	21.0	62.90
1972	22.7	21.0	10.5	23.6	0.0	0.0	4.0	4.8	17.8	7.6	25.6	28.4	28.40
1973	30.4	20.6	37.0	34.1	13.2		3.2	3.0	18.0	20.5	41.8	5.3	41.80
1974	13.8	28.5	16.0	16.9	15.4	3.5		6.6	3.0	12.2	18.3	10.5	28.50
1975	13.7	11.7	47.8	14.1	2.7	9.5	0.0	0.0	8.2	23.4	21.8	18.2	47.80
1976	18.1	20.5	20.4	3.1	5.1	3.9	0.4	7.2	9.0	2.5	18.0	22.8	22.80
1977	18.3	25.2	28.6	5.5	2.4	0.0	0.0	0.0	12.8	13.9	19.1	10.0	28.60
1978	24.4	19.4	12.1	6.5	1.6	0.0	0.0	0.0	5.0	11.3	34.7	48.8	48.80
1979	23.3	6.5	15.6	12.7	2.4	0.0	0.0	0.0	4.7	13.2	8.2	18.2	23.30
1980	21.9	20.3	16.3	4.1	2.6	0.0	5.3	2.6	7.7	16.7	3.6	12.2	21.90
1981	17.5	12.9	16.7	17.8	2.7	2.4	0.0	7.1	7.2	11.8	7.3	34.1	34.10
1982	7.0	25.7	13.1	13.2	0.0	0.0	0.0	5.9		12.6		17.1	25.70
1983													
1984									0.8	15.7	21.9	25.5	25.50
1985	4.9	7.5	6.6	30.1			0.0	0.5	4.3	6.1	29.6	13.4	30.10
1986	19.3	12.0	8.4	16.8		0.0	0.0	3.7	21.4	4.2			21.40
1987	30.0	23.0	10.2	3.5	5.3	15.6							30.00
1988													
1989													
1990													
1991													
1992			16.4	4.8	0.0	8.0	0.0	35.8					35.80
1993	27.0	13.9	14.0	26.3	3.4	4.3	0.8	2.8	11.0	24.9	21.0	24.5	27.00
1994	19.0	37.8	20.3	14.0	0.5	0.0	0.0	6.3	6.5	12.3	17.2	19.1	37.80
1995	18.9	23.0	16.6	1.7	0.1	0.0	0.0	0.6	2.5	9.8	52.9	16.9	52.90
1996	21.1	9.4	29.2	6.4	6.1	0.3	2.0	1.5	7.8	1.1	21.2	21.1	29.20
1997	20.4	23.5	27.8	14.0	5.8	0.0	0.0	7.3	14.1	7.8	26.1	25.7	27.80

1998	15.4	25.8	23.4	15.5	0.0	6.1	0.0	0.0	7.2	17.2	20.6	7.6	25.80
1999	30.3	11.2	28.8	11.2	2.0	0.7	0.0	0.5	7.2	17.7	11.4	12.5	30.30
2000	15.6	14.1	8.0	8.0	1.7	3.9	0.5	15.0	0.4	12.4	8.0	7.9	15.60
2001	25.6	19.9	32.6	8.2	10.5	0.0	3.8	5.5	7.6	10.4	15.6	58.8	58.80
2002	27.5	13.4	61.8	13.7	4.1	1.7	4.3	3.6	6.2	34.1	21.1	37.4	61.80
2003	15.0	21.9	23.1	24.5	2.9	5.7	0.6	2.2	5.3	9.0	15.1	61.9	61.90
2004	22.4	21.2	15.4	5.8	10.0		2.2	13.1	14.4	3.8	19.7	13.3	22.40
2005	9.2	29.6	17.9	15.6	0.3	0.0	0.0	4.8	10.0	14.5	8.5	13.0	29.60
2006	22.2	16.9	11.2	5.1	0.2	1.3	0.0	2.3	8.1	25.2	14.3	13.6	25.20
2007	29.0	14.6	20.6	13.8	5.4	0.2	0.3	0.8	11.8	4.8	18.2	21.8	29.00
2008	10.0	29.0	7.9	0.9	3.1	0.0	0.0	0.0	12.8	12.1	28.5	29.7	29.70
2009	20.0	13.6	33.9	29.6	4.2	0.0	0.3	0.0	3.8	8.5	19.5	24.8	33.90
2010	32.4	17.4	28.1	21.7	3.1	0.0	0.3	2.3	0.0	15.0	21.1	12.5	32.40
2011	17.2	28.0	9.1	13.0	0.3	0.0	1.9						28.00
2012													53.11
2013													25.25
2014													27.35
2015													18.46
2016													35.22
PROM	19.80	20.43	20.21	13.20	3.88	1.78	1.46	4.27	8.96	12.22	18.68	21.82	32.68
STD	7.01	9.91	11.04	8.02	4.12	3.27	2.70	6.18	5.18	6.72	9.84	12.69	11.94
MIN	4.90	6.50	6.60	0.90	0.00	0.00	0.00	0.00	0.00	1.10	3.20	5.30	14.90
MAX	36.40	62.90	61.80	34.10	15.40	15.60	12.00	35.80	21.40	34.10	52.90	61.90	62.90
MEDIANA	19.00	20.30	17.10	13.10	2.70	0.00	0.00	2.45	8.00	11.95	18.70	19.10	29.10

NOMBRE : PROGRESO

CUENCA : RAMIS

CODIGO : 110778

TIPO : CO

LATITUD 14°41'21.1"

LONGITUD 70°21'55.8"

ALTITUD 3970 MSNM

REGION : PUNO

PROV : AZANGARO

DIST : ASILLO

AÑO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	MAX
1964	17.5	15.0	25.8	14.0	14.7	0.0	0.0	0.5	6.5	10.5	21.9	11.5	25.80
1965	21.8	21.7	20.7	16.0	1.6	0.0	0.0	0.0	8.4	5.6	24.6	28.4	28.40
1966	20.8	20.6	12.0	0.3	15.9	0.0	0.0	0.0	22.5	1.6	19.3	19.6	22.50
1967	12.2	25.4	20.0	10.6	2.7	0.0	5.1	5.9	4.3	18.0	19.7	16.9	25.40
1968	11.2	21.5	20.8	12.9	0.8	0.0	13.4	9.7	14.8	6.0	11.2	11.7	21.50
1969	18.3	12.8	10.2	12.6	0.3	1.4	10.6	0.2	4.9	13.5	11.1	13.3	18.30
1970	16.1	14.3	17.1	18.8	5.2	0.5	0.8	0.0	26.8	15.6	23.5	23.9	26.80
1971	35.4	42.5	4.6	13.8	5.9	0.1	0.0	1.8	0.8	15.2	17.6	20.5	42.50
1972	34.1	27.9	20.8	7.9	0.4	0.0	2.7	4.0	9.6	5.9	12.6	23.1	34.10
1973	28.9	19.6	17.2	21.3	7.5	0.0	3.3	2.5	15.2	37.2	38.3	33.9	38.30
1974	11.2	16.4	14.1	9.2	12.3	5.1	0.2	5.8	9.5	8.4	17.0	17.4	17.40
1975	19.0	12.8	19.8	14.0	2.4	0.0	0.0	0.0	14.6	10.1	9.4	14.7	19.80
1976	34.9	17.4	14.7	13.4	1.2	4.2	2.8	4.2	21.2	7.3	18.9	19.5	34.90
1977	13.0	14.7	30.0	9.0	2.7	0.0	0.0	0.0	5.9	11.7	24.8	20.4	30.00
1978	21.2	14.9	17.0	26.1	2.3	0.0	0.0	0.0	22.6	4.7	20.8	27.0	27.00
1979	20.2	12.1	11.3	19.0	6.5	0.0	5.0	4.6	6.4	8.1	9.0	14.6	20.20
1980	17.8	17.0	15.7	3.5	5.2	0.2	2.3	0.0	3.5	21.6	2.9	22.0	22.00
1981	22.7	20.1	17.0	26.4	1.4	0.0	0.0	2.8	19.4	16.7	12.9	27.5	27.50
1982	20.0	27.7	15.6	9.1	0.0	0.0	0.0	0.8	5.0	19.8	23.6	22.6	27.70
1983	16.3	14.9	19.1	9.2	5.0	0.0	0.0	0.0	0.0	6.6	16.3	14.9	19.10
1984	17.9	11.1	17.9	11.8	7.4	0.5	3.9	2.7	12.6	12.1	20.6	18.4	20.60
1985	22.0	22.0	16.0	11.8	5.3	0.6	0.0	0.0	11.5	5.2	20.6	21.7	22.00
1986	26.2	22.0	28.5	17.0	8.6	0.0	3.7	4.0	11.1	13.9	10.5	14.8	28.50
1987	14.1	14.3	20.5	14.0	1.0	1.0	12.2	0.0	6.0	30.2	24.5	44.6	44.60
1988	21.5	20.0	15.0	19.0	6.6	0.0	0.0	0.0	9.0	7.7	7.0	12.8	21.50
1989	22.5	19.9	38.1	16.4	3.5	2.2	0.0	7.5	11.5	13.0	12.0	13.0	38.10
1990	14.0	25.0	18.0	10.0	0.0	7.4	0.0	5.4	12.0	10.9	12.0	10.0	25.00
1991	22.4	23.4	20.6	19.4	0.0	0.0	0.0	0.0	6.0	13.9	7.6	24.8	24.80
1992	19.9	20.0	17.0	9.8	0.0	3.2	0.0	20.3	9.9	10.4	19.7	14.1	20.30
1993	28.2	19.4	21.4	12.5	5.2	3.7	10.2	8.8	5.9	17.2	22.7	15.5	28.20
1994	16.5	23.2	30.2	17.8	4.8	0.5	0.0	32.0	7.4	24.4	18.4	22.8	32.00
1995	21.2	22.2	34.2	14.8	0.0	0.0	0.0	0.0	6.2	10.4	27.8	24.4	34.20
1996	30.0	10.0	16.6	8.8	10.8	0.0	1.4	0.0	6.2	11.6	11.0	23.6	30.00
1997	37.4	34.2	23.4	18.8	11.4	0.0	0.0	8.2	6.8	13.8	18.0	20.4	37.40

1998	17.6	10.4	14.6	5.7	0.0	4.0	0.0	1.2	2.2	15.8	28.0	8.0	28.00
1999	26.2	15.8	23.6	15.4	0.5	0.0	0.0	0.0	4.0	15.0	14.8	11.9	26.20
2000	14.4	19.2	16.2	5.4	1.4	1.2	1.6	2.4	8.2	16.4	8.6	22.4	22.40
2001	18.6	26.4	25.2	16.2	14.2	0.0	5.5	0.0	6.4	11.0	30.5	15.2	30.50
2002	24.2	14.6	17.6	41.2	8.8	1.8	12.6	4.4	10.8	26.4	21.4	32.2	41.20
2003	22.2	16.2	23.4	25.4	3.6	7.6	0.5	2.8	8.0	9.8	5.6	29.8	29.80
2004	23.4	25.6	13.2	15.2	5.4	0.0	4.8	19.6	9.2	5.4	16.8	26.2	26.20
2005	11.4	42.6	11.0	19.4	0.5	0.0	1.2	1.8	3.8	10.2	13.6	15.2	42.60
2006	23.6	8.8	15.2	10.7	0.0	1.6	0.0	3.4	16.4	22.4	11.6	25.0	25.00
2007	28.4	16.7	18.4	16.0	7.8	0.6	0.5	0.0	11.8	7.4	17.4	7.4	28.40
2008	20.8	17.8	9.4	4.6	6.2	0.0	0.0	0.0	6.4	10.8	17.4	27.8	27.80
2009	22.8	29.4	15.4	5.6	5.2	0.0	3.2	0.8	2.8	12.2	20.8	15.6	29.40
2010	26.6	37.6	13.2	21.6	3.4	0.0	0.0	2.2	0.0	11.8	8.6	17.6	37.60
2011	12.6	22.8	42.8	16.8	1.6	0.0	2.8						42.80
2012													44.18
2013													26.26
2014													27.82
2015													26.42
2016													33.98
PROM	21.23	20.41	19.17	14.34	4.53	0.99	2.30	3.62	9.23	13.05	17.08	19.97	28.92
STD	6.42	7.56	7.15	6.94	4.22	1.86	3.65	6.10	5.99	6.86	7.07	7.24	7.13
MIN	11.20	8.80	4.60	0.30	0.00	0.00	0.00	0.00	0.00	1.60	2.90	7.40	17.40
MAX	37.40	42.60	42.80	41.20	15.90	7.60	13.40	32.00	26.80	37.20	38.30	44.60	44.60
MEDIANA	21.00	19.75	17.40	14.00	3.55	0.00	0.10	1.80	8.00	11.70	17.40	19.60	27.80

NOMBRE : MUÑANI
 CUENCA : RAMIS
 CODIGO : 110785
 TIPO : CO

LATITUD 14°46'01.0"
 LONGITUD 69°57'06.5"
 ALTITUD 3948 MSNM

REGION : PUNO
 PROV : AZANGARO
 DIST : MUÑANI

AÑO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SET	OCT	NOV	DIC	MAX
1964													0.00
1965													0.00
1966	15.0	35.1	20.0	10.1	10.2	0.0	0.0	0.0	5.1	8.0	15.0	15.1	35.10
1967	10.2	10.0	10.0	10.3	10.2	0.0	10.0	10.0	16.0	28.7	8.5	45.4	45.40
1968	20.7	27.3	20.0	15.8	5.2	0.0	23.8	25.0	25.0	7.5	20.5	10.2	27.30
1969	20.0	15.8	11.9	26.2	0.0	0.0	0.0	4.2	7.6	10.0	10.2	20.5	26.20
1970	35.2	12.3	9.5	17.4	5.0	0.0	1.4	0.4	20.1	18.3	13.8	22.0	35.20
1971	23.0	25.0	31.0	8.0	7.0	0.0	0.0	1.2	0.0	12.4	9.4	10.0	31.00
1972	14.0	13.0	4.0	3.2	0.0	0.0	0.0	2.8	2.8	8.2	17.2	11.6	17.20
1973	9.8	10.4	11.2	24.2	0.4	0.0	0.0	15.6	17.6	2.6	19.2	10.4	24.20
1974	10.4	7.2	7.2	4.4	0.0	0.8	0.0	0.2	0.0	4.0	2.4	23.2	23.20
1975	9.0	6.2	8.4	4.8	2.0	0.0	0.0	0.0	0.0	4.2	5.0	18.8	18.80
1976	15.2	16.4	14.4	16.4	0.0	0.0	0.0	0.0	0.0	0.0	9.6	16.7	16.70
1977	14.9	30.4	15.5	4.5	0.0	0.0	0.0	0.0	11.8	16.4	18.5	19.7	30.40
1978	19.1	22.1	20.2	14.9	4.1	4.9	0.0	0.0	13.2	10.2	40.5	41.8	41.80
1979	29.7	9.5	12.5	23.2	5.6	0.0	0.0	0.0	8.2	19.6	13.2	16.6	29.70
1980	24.1	11.7	10.9	3.6	1.8	3.4	3.6	0.0	7.5	25.8	11.0	15.2	25.80
1981	30.3	9.2	20.4	20.6	0.0	0.0	0.0	6.7	7.6	20.6	12.0	19.8	30.30
1982	19.5	12.8	15.5	20.4	0.0	0.0	0.0	0.0	12.4	10.1	27.5	6.1	27.50
1983	17.6	16.8	10.9	12.6	7.2	0.0	0.0	0.0	6.2	10.4	6.9	15.3	17.60
1984	18.8	23.6	13.9	10.4	3.7	5.0	0.0	5.6	7.6	14.3	40.4	28.2	40.40
1985	11.8	23.2	16.0	22.4	3.7	4.3	0.0	0.0	17.2	20.3	20.3	23.6	23.60
1986	15.5	27.6	20.1	13.6	6.7	0.0	2.3	0.0	9.6	0.0	27.3	15.2	27.60
1987	24.2	24.3	11.2	24.1	0.0	6.2	11.3	3.4	1.2	10.8	21.4	10.1	24.30
1988	27.7	22.3	12.3	18.9	13.4	0.0	0.0	0.0	0.0	17.0	2.8	21.0	27.70
1989	21.0	26.6	18.1	24.1	0.0	7.4	0.0	4.8	6.8	12.4	16.6	13.6	26.60
1990	31.0	13.6	13.2	3.2	0.0	13.7	0.0	0.0	5.6	12.1	29.8	13.6	31.00
1991	20.2	28.3	24.2	18.2	6.2	15.2	0.0	0.0	3.8	6.8	18.7	20.6	28.30
1992	31.0	22.7	13.7	13.8	0.0	4.3	0.0	12.4	8.2	10.8	1.4	22.0	31.00
1993	20.8	17.6	16.4	7.7	3.8	0.0	6.8	8.0	11.3	16.1	13.0	14.0	20.80
1994	15.1	20.2	11.0	22.0	19.6	3.1	0.0	0.0	4.7	6.3	12.4	24.5	24.50
1995	22.3	26.0	16.9	2.1	0.0	0.0	0.0	0.0	0.0	5.7	16.7	22.0	26.00
1996	24.2	13.2	19.9	14.9	10.2	0.0	0.0	3.5	6.3	8.6	15.1	12.3	24.20
1997	22.5	32.0	38.2	15.3	3.2	0.0	0.0	22.3	12.5	14.9	16.0	9.1	38.20
1998	13.1	17.2	21.8	13.4	0.0	1.8	0.0	0.0	0.0	9.8	16.0	20.6	21.80
1999	14.7	10.9	21.8	14.0	15.9	0.0	0.0	0.0	9.2	9.2	12.6	30.2	30.20

2000	16.0	12.9	15.8	4.3	0.0	7.8	0.0	3.6	6.4	18.8	11.3	20.7	20.70
2001	13.8	15.0	32.7	7.4	15.9	3.2	8.2	4.3	4.5	19.5	21.3	19.5	32.70
2002	11.1	12.4	11.7	12.9	5.7	2.3	9.6	3.1	6.9	18.9	12.1	20.4	20.40
2003	29.6	28.4	26.4	11.2	1.8	9.1	0.0	4.2	14.3	23.8	15.4	23.0	29.60
2004	31.9	32.2	27.1	14.1	18.2	1.8	0.8	14.2	6.2	16.0	24.7	19.4	32.20
2005	14.8	30.1	18.4	13.2	2.3	0.0	1.2	1.0	2.3	15.4	24.2	14.8	30.10
2006	29.2	14.2	20.8	27.7	0.0	0.0	0.0	3.4	18.4	23.6	10.8	23.2	29.20
2007	17.2	4.8	22.2	11.6	8.6	0.0	0.0	0.0	10.4	4.0	12.4	16.5	22.20
2008	21.5	9.5	8.0	7.0	1.9	0.0	0.0	0.0	8.2	33.4	7.9	30.6	33.40
2009	20.0	10.9	17.7	10.8	0.0	0.0	4.4	0.0	6.2	9.5	14.6	13.7	20.00
2010	15.2	20.0	22.2	11.4	6.2	0.0	0.0	3.7	0.0	20.8	6.2	15.5	22.20
2011	35.8	16.5	14.6	6.0	2.0	0.0	7.2						35.80
2012													15.91
2013													38.47
2014													19.49
2015													31.81
2016													26.55
PROM	20.17	18.42	16.95	13.40	4.52	2.05	1.97	3.64	7.75	13.24	15.60	19.03	26.61
STD	7.05	7.89	6.86	6.84	5.27	3.59	4.46	5.82	5.99	7.40	8.41	7.60	8.39
MIN	9.00	4.80	4.00	2.10	0.00	0.00	0.00	0.00	0.00	0.00	1.40	6.10	0.00
MAX	35.80	35.10	38.20	27.70	19.60	15.20	23.80	25.00	25.00	33.40	40.50	45.40	45.40
MEDIANA	19.75	16.65	15.90	13.30	2.75	0.00	0.00	0.40	6.90	12.10	14.60	19.40	27.30

METODO DE LA DISTACIA MEDIA

Estacion	Altura	Este	Norte	d	1/d2	W (pesos)
AZANGARO	3,863 msnm	371926.62	8350803.45	18500.83276	2.92158E-09	0.382384952
PROGRESO	3,970 msnm	352976.45	8375605.7	15519.17529	4.15205E-09	0.543433079
MUÑANI	3,948 msnm	397559.68	8367233.83	42004.17863	5.66781E-10	0.074181969
ASILLO	3,980 msnm	356114	8360407		7.64041E-09	1.0000

AÑO	Estacion Azangaro	Estacion Progreso	Estacion Muñani	Estacion Asillo
1964	21.5	25.8	0.0	22.2
1965	31.5	28.4	0.0	27.5
1966	37.0	22.5	35.1	29.0
1967	28.8	25.4	45.4	28.2
1968	14.9	21.5	27.3	19.4
1969	22.5	18.3	26.2	20.5
1970	36.4	26.8	35.2	31.1
1971	62.9	42.5	31.0	49.4
1972	28.4	34.1	17.2	30.7
1973	41.8	38.3	24.2	38.6
1974	28.5	17.4	23.2	22.1
1975	47.8	19.8	18.8	30.4
1976	22.8	34.9	16.7	28.9
1977	28.6	30.0	30.4	29.5
1978	48.8	27.0	41.8	36.4
1979	23.3	20.2	29.7	22.1
1980	21.9	22.0	25.8	22.2
1981	34.1	27.5	30.3	30.2
1982	25.7	27.7	27.5	26.9
1983	0.0	19.1	17.6	11.7
1984	25.5	20.6	40.4	23.9
1985	30.1	22.0	23.6	25.2
1986	21.4	28.5	27.6	25.7
1987	30.0	44.6	24.3	37.5
1988	0.0	21.5	27.7	13.7
1989	0.0	38.1	26.6	22.7
1990	0.0	25.0	31.0	15.9
1991	0.0	24.8	28.3	15.6
1992	35.8	20.3	31.0	27.0
1993	27.0	28.2	20.8	27.2
1994	37.8	32.0	24.5	33.7
1995	52.9	34.2	26.0	40.7
1996	29.2	30.0	24.2	29.3

1997	27.8	37.4	38.2	33.8
1998	25.8	28.0	21.8	26.7
1999	30.3	26.2	30.2	28.1
2000	15.6	22.4	20.7	19.7
2001	58.8	30.5	32.7	41.5
2002	61.8	41.2	20.4	47.5
2003	61.9	29.8	29.6	42.1
2004	22.4	26.2	32.2	25.2
2005	29.6	42.6	30.1	36.7
2006	25.2	25.0	29.2	25.4
2007	29.0	28.4	22.2	28.2
2008	29.7	27.8	33.4	28.9
2009	33.9	29.4	20.0	30.4
2010	32.4	37.6	22.2	34.5
2011	28.0	42.8	35.8	36.6
2012	53.1	44.2	15.9	45.5
2013	25.3	26.3	38.5	26.8
2014	27.4	27.8	19.5	27.0
2015	18.5	26.4	31.8	23.8
2016	35.2	34.0	26.5	33.9
PROM	29.59	28.92	26.61	29.01
STD	14.85	7.13	8.39	8.06
MIN	0.00	17.40	0.00	11.69
MAX	62.90	44.60	45.40	49.45
MEDIANA	28.60	27.80	27.30	28.17

1

Región Puno
ESTACION ASILLO

N°	AÑO	Precipitación Máx. 24 horas (mm)
1	1964	22.24
2	1965	27.48
3	1966	28.98
4	1967	28.18
5	1968	19.41
6	1969	20.49
7	1970	31.09
8	1971	49.45
9	1972	30.67
10	1973	38.59
11	1974	22.07
12	1975	30.43
13	1976	28.92
14	1977	29.49
15	1978	36.43
16	1979	22.09
17	1980	22.24
18	1981	30.23
19	1982	26.92
20	1983	11.69
21	1984	23.94
22	1985	25.22
23	1986	25.72
24	1987	37.51
25	1988	13.74
26	1989	22.68
27	1990	15.89
28	1991	15.58
29	1992	27.02
30	1993	27.19
31	1994	33.66
32	1995	40.74
33	1996	29.26
34	1997	33.79
35	1998	26.70
36	1999	28.06
37	2000	19.67
38	2001	41.48
39	2002	47.53
40	2003	42.06
41	2004	25.19
42	2005	36.70
43	2006	25.39
44	2007	28.17
45	2008	28.94
46	2009	30.42
47	2010	34.47
48	2011	36.62
49	2012	29.01
50	2013	8.06
51	2014	11.69
52	2015	49.45
53	2016	28.17

DATOS ORDENADOS

Región Puno
ESTACION ASILLO

m	Precipitación Máx. 24 horas (mm)
1	8.06
2	11.69
3	11.69
4	13.74
5	15.58
6	15.89
7	19.41
8	19.67
9	20.49
10	22.07
11	22.09
12	22.24
13	22.24
14	22.68
15	23.94
16	25.19
17	25.22
18	25.39
19	25.72
20	26.70
21	26.92
22	27.02
23	27.19
24	27.48
25	28.06
26	28.17
27	28.17
28	28.18
29	28.92
30	28.94
31	28.98
32	29.01
33	29.26
34	29.49
35	30.23
36	30.42
37	30.43
38	30.67
39	31.09
40	33.66
41	33.79
42	34.47
43	36.43
44	36.62
45	36.70
46	37.51
47	38.59
48	40.74
49	41.48
50	42.06
51	47.53
52	49.45
53	49.45

DISTRIBUCIONES DE PROBABILIDAD

1.1.- DISTRIBUCION NORMAL O DISTRIBUCION NORMAL DE DOS PARAMETROS

1.1.1.- Función de densidad

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp \frac{-1(x-\mu)^2}{2\sigma^2} \quad ; -\infty < x < \infty$$

donde,

m : media o promedio

s : Desviación estándar

1.1.2.- Función de distribución acumulada

$$F(x) = \frac{1}{\sqrt{2\pi}\sigma} \int_{-\infty}^x e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2} dx$$

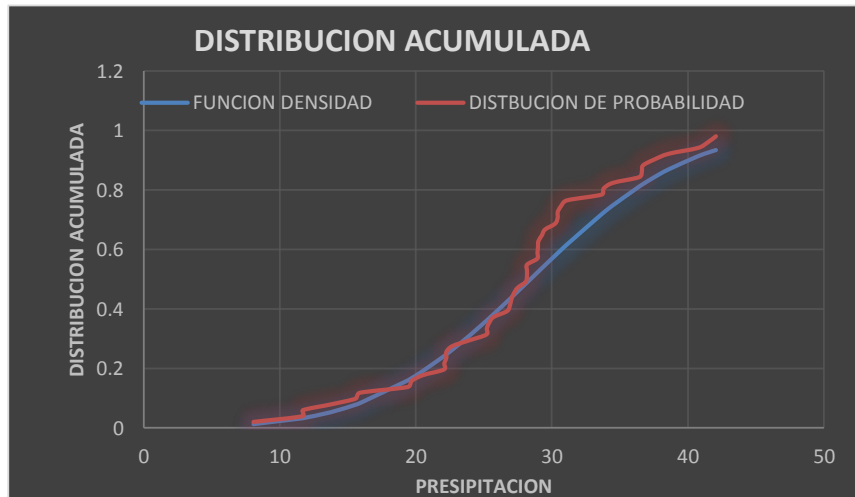
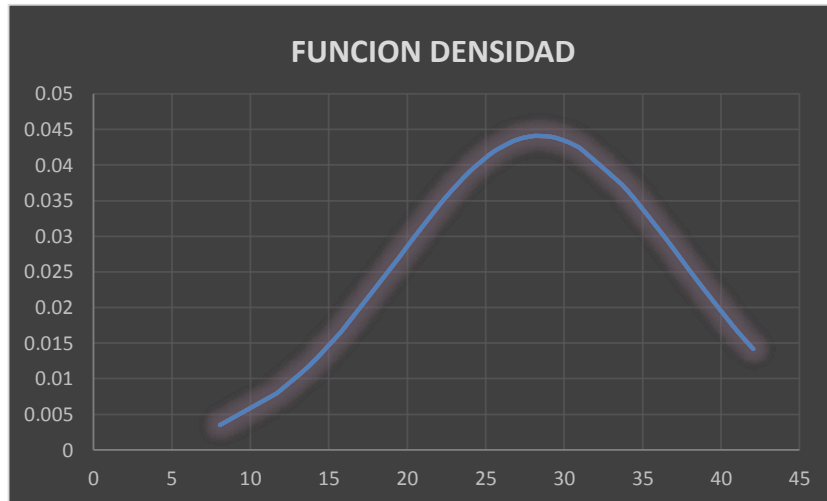
Weibull ----> $P = \frac{m}{n+1}$

M	PRESIPITACION (X) (mm)	FUNCION DENSIDAD	DISTRIBUCION ACUMULADA	DISTRIBUCION DE PROBABILIDAD	DIFERENCIA
1	8.063307824	0.003493231	0.012159307	0.019607843	0.007448536
2	11.68517446	0.007944817	0.032042476	0.039215686	0.00717321
3	11.68517446	0.007944817	0.032042476	0.058823529	0.026781053
4	13.73865174	0.011788821	0.052130779	0.078431373	0.026300594
5	15.57649008	0.016064725	0.077611016	0.098039216	0.020428199
6	15.88546801	0.016854202	0.082696147	0.117647059	0.034950912
7	19.40651473	0.026812464	0.15917838	0.137254902	0.021923478
8	19.67367298	0.027602502	0.166447102	0.156862745	0.009584356
9	20.49205435	0.030007048	0.190022778	0.176470588	0.01355219
10	22.07472839	0.034457761	0.241085145	0.196078431	0.045006714
11	22.09012205	0.034498955	0.241615893	0.215686275	0.025929619
12	22.24184992	0.034902225	0.246881004	0.235294118	0.011586886
13	22.24365299	0.034906987	0.24694394	0.254901961	0.007958021
14	22.67804069	0.036031475	0.262353009	0.274509804	0.012156795
15	23.94248924	0.03899969	0.309842073	0.294117647	0.015724426
16	25.19202899	0.041370939	0.360120571	0.31372549	0.04639508
17	25.21600926	0.041410098	0.361113127	0.333333333	0.027779793
18	25.38804126	0.041683515	0.368260697	0.352941176	0.01531952
19	25.71830307	0.042170698	0.382109002	0.37254902	0.009559982
20	26.6988249	0.043309311	0.424055101	0.392156863	0.031898238
21	26.9203937	0.043499951	0.433672678	0.411764706	0.021907972
22	27.02071382	0.043577941	0.438040554	0.431372549	0.006668005
23	27.19219149	0.043699121	0.445523807	0.450980392	0.005456585
24	27.47862544	0.043867104	0.45806581	0.470588235	0.012522425
25	28.06450618	0.044074807	0.483836509	0.490196078	0.00635957
26	28.16950277	0.044092577	0.488465198	0.509803922	0.021338724
27	28.16950277	0.044092577	0.488465198	0.529411765	0.040946567
28	28.18374821	0.044094531	0.48909333	0.549019608	0.059926277
29	28.92303025	0.044045795	0.521691754	0.568627451	0.046935697
30	28.94195043	0.044040686	0.522525061	0.588235294	0.065710233
31	28.97927461	0.044030045	0.524168647	0.607843137	0.08367449
32	29.00856677	0.04402117	0.525458253	0.62745098	0.101992727
33	29.26383662	0.043924398	0.53668392	0.647058824	0.110374904
34	29.49433385	0.043807206	0.546795407	0.666666667	0.119871259
35	30.2314502	0.043245568	0.578896739	0.68627451	0.10737777

36	30.42342178	0.043053517	0.587180523	0.705882353	0.11870183
37	30.43259669	0.043043874	0.587575491	0.725490196	0.137914705
38	30.6667305	0.042783626	0.597623581	0.745098039	0.147474458
39	31.09402408	0.042239684	0.615791669	0.764705882	0.148914213
40	33.66146796	0.037318065	0.718478879	0.784313725	0.065834846
41	33.78845004	0.037012623	0.723198263	0.803921569	0.080723306
42	34.46919593	0.035298433	0.747818	0.823529412	0.075711412
43	36.43388509	0.029820856	0.81188787	0.843137255	0.031249385
44	36.62142893	0.029272357	0.817429193	0.862745098	0.045315905
45	36.70172102	0.029036809	0.819770078	0.882352941	0.062582863
46	37.51128574	0.026647593	0.842311349	0.901960784	0.059649435
47	38.59238157	0.023465686	0.869395762	0.921568627	0.052172865
48	40.74230646	0.01746502	0.913283666	0.941176471	0.027892804
49	41.48469447	0.015566033	0.925537953	0.960784314	0.035246361
50	42.05972057	0.014172471	0.934084777	0.980392157	0.04630738
51	47.53414506	0.004739601	0.982666615	1	0.017333385
52	49.44756038	0.002964464	0.989931776	1.019607843	0.029676067
53	49.44756038	0.002964464	0.989931776	1.039215686	0.04928391

promedio	28.4310
desviacion S	9.04405

MAXIMA	0.1489



DETERMINACIÓN DE LA PRECIPITACIÓN PROYECTADA CON

1.2.3 Factor de frecuencia:

Para calcular diversas magnitudes para periodos de retorno específicos, es decir calcular un X_T dado para un valor de T .

$$X_T = e^{\mu_y + K_T \sigma_y}$$

$$K_T = z$$

$$z = - \left(w - \frac{2.5155170.802853 + 0.010328^2}{1 + 1.432788w + 0.189269w^2 + 0.001308w^3} \right)$$

Cuando $p > 0.5$

$$w = \left[\ln \left(\frac{1}{1-p^2} \right) \right]^{1/2}$$

$$w = \left[\ln \left(\frac{1}{p^2} \right) \right]^{1/2}$$

DATOS DE DISTRIBUCION LOGNORMAL DE DOS PARAMETROS

PROMEDIO (μ_y)	3.2902
DESVIACION	0.3615

CUADRO DE PRECIPITACION CON PERIODOS DE RETORNO				
TR (AÑOS)	P	W	Kt	presicipacion proyectada (de Diseño) X_t
2.00000	0.50000	0.53636	1.08124	39.68872
5.00000	0.20000	0.20204	1.86248	52.64155
10.00000	0.10000	0.10025	2.16602	58.74714
25.00000	0.04000	0.04002	2.36881	63.21586
50.00000	0.02000	0.02000	2.44087	64.88438
100.00000	0.01000	0.01000	2.47785	65.75781