

## CHAPTER 3

### RAINFALL DISTRIBUTION AND IRRIGATION

**Table 3.1: Total Monthly Rainfall (in mm) for selected stations 1996**

Station/Month	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Amani	3.2	153.3	135.0	179.0	324.3	39.0	24.5	57.8	30.9	51.1	101.8	14.3	1,114.2
Moshi	3.2	76.7	51.6	218.0	194.6	6.5	8.4	2.8	5.0	10.1	13.9	0.0	590.8
Arusha	71.8	112.6	73.0	259.8	74.6	3.1	2.2	0.0	1.8	3.0	46.9	16.1	664.9
Songea	149.3	432.4	243.6	82.6	22.8	0.0	0.2	0.0	0.0	0.3	9.2	263.3	1,203.7
Mtwara	113.5	205.8	108.0	111.9	113.5	0.9	14.8	7.5	0.1	7.3	20.9	50.7	754.9
Tabora	95.3	221.0	266.8	55.5	5.8	0.0	0.0	0.0	5.2	6.2	5.8	179.3	840.9
Dodoma	108.3	228.0	221.0	69.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	96.7	723.6
Mwanza	149.2	137.0	123.6	110.2	37.0	9.3	47.6	40.6	30.9	24.7	117.3	46.4	873.8
Bukoba	131.1	165.0	236.9	359.7	361.5	72.0	6.1	13.3	102.9	126.4	108.3	158.6	1,841.8
Kigoma	208.5	158.0	143.7	121.7	14.5	2.1	0.0	0.0	33.3	42.8	90.0	143.7	958.3
Mbeya	254.7	163.0	135.0	121.9	9.4	0.0	0.8	0.1	0.0	18.6	35.6	235.6	974.7

Source : Directorate of Meteorology, Ministry of Communications and Transport

**Table 3.2 : Monthly Rainfall (in mm) at selected stations for the year 1997**

Station/Month	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bukoba	95.4	20.5	163.2	340.7	170.3	2.2	17.1	62.6	101.6	252.3	408.4	352.4	1,986.7
Mwanza	166.1	23.7	170.6	334.6	93.0	48.1	2.0	1.2	1.0	145.7	238.7	181.2	1,405.9
Musoma	56.9	26.2	126.3	269.7	74.6	34.8	14.0	18.6	2.0	104.2	294.4	205.5	1,227.2
Shinyanga	74.9	157.2	62.7	174.1	175.9	0.0	0.0	0.0	0.0	0.0	92.0	475.4	1,212.2
Arusha	17.4	8.8	82.0	177.1	139.2	31.9	12.6	0.0	0.0	74.8	180.3	425.3	1,149.4
Kilimanjaro	4.2	0.0	58.1	330.5	196.3	38.0	11.1	0.0	0.0	49.2	72.3	144.5	904.2
Moshi	0.0	12.6	126.9	375.3	177.1	26.2	14.7	0.6	1.0	125.5	108.8	67.1	1,035.8
Tanga	0.0	1.7	97.1	254.3	194.3	152.6	13.7	55.6	44.5	805.5	271.2	75.4	1,965.9
Karume	0.4	0.0	296.7	479.5	77.2	159.8	149.0	7.8	0.7	372.0	142.0	245.8	1,930.9
D'salaam	1.7	0.3	232.8	167.0	98.8	173.5	5.6	5.8	2.9	244.7	164.7	184.3	1,282.1
Morogoro	13.8	55.6	156.6	246.5	35.7	39.5	4.4	2.0	0.0	88.5	93.9	252.3	988.8
Mtwara	45.2	122.9	342.1	136.3	44.6	45.5	11.6	1.0	5.0	13.1	160.8	194.3	1,122.4
Dodoma	46.4	82.5	22.0	26.7	52.6	0.0	0.0	0.0	0.0	1.8	89.5	310.4	631.9
Tabora	178.6	152.9	139.4	179.7	68.3	7.2	0.0	0.0	0.0	0.0	49.8	462.0	1,237.9
Kigoma	150.6	6.2	107.9	118.2	111.1	0.0	0.0	0.0	0.0	224.1	111.0	173.2	1,002.3
Iringa A/P	75.7	176.7	29.6	75.1	67.2	0.0	0.0	0.0	0.0	1.1	47.3	287.6	760.3
Mb'ya A/P	134.9	182.1	51.4	192.1	0.0	0.0	1.4	0.0	0.0	22.7	158.5	481.2	1,224.3
Songea	185.3	316.0	49.5	66.6	0.0	10.7	0.0	0.0	0.0	2.7	6.5	258.9	896.2
Mahenge	149.3	168.6	476.6	566.8	24.9	149.2	16.4	0.0	0.0	110.9	227.2	413.1	2,303.0

Source : Directorate of Meteorology, Ministry of Communications and Transport

**Table 3.3: Monthly Rainfall (in mm) at selected Stations with full Data for the Year 1998**

Station/Month	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bukoba	251.6	178.6	205.8	367.4	213.7	132.4	76.8	0.0	140.0	136.1	159.0	97.7	2057.2
Mwanza	151.5	115.8	94.4	234.2	24.2	80.1	1.2	0.0	16.5	45.4	86.2	27.4	876.9
Arusha	171.1	87.3	152.1	261.6	170.1	12.5	9.6	0.3	2.5	0.4	17.7	14.8	900.0
S.wanga	245.5	105.7	121.4	181.6	37.8	0.0	0.0	0.3	0.0	0.5	57.8	77.8	828.4
Iringa	199.5	170.1	91.1	108.0	98.9	0.0	0.0	0.0	0.0	0.0	0.7	18.9	687.2
Mbeya	191.5	352.0	124.2	86.9	8.8	0.0	0.0	0.0	0.0	16.5	8.6	76.6	865.1
Tabora	279.0	96.4	112.5	97.8	55.5	0.0	0.0	0.0	29.2		26.2	114.8	811.4

NB: Figure for October for Tabora region was not obtained

Source : Directorate of Meteorology, Ministry of Communications and Transport

**Table 3.4: Monthly Rainfall (in mm) at selected Stations for the Year 1999**

Station/Month	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bukoba	212.4	43.8	311.0	222.4	279.6	11.6	9.6	58.8	148.4	75.7	208.1	243.4	<b>1,824.8</b>
Mwanza	94.1	0.1	184.0	169.8	18.6	0.0	0.0	59.2	5.4	68.4	228.0	227.7	<b>1,055.3</b>
Musoma	93.9	12.8	343.5	136.3	64.1	0.0	0.0	4.9	11.1	31.4	181.1	33.4	<b>912.5</b>
Shinyanga	116.0	58.7	108.3	229.6	0.5	0.0	0.0	0.2	4.6	0.0	100.1	91.2	<b>709.2</b>
Arusha	35.1	13.5	176.2	95.8	75.2	15.2	8.2	6.7	1.1	0.7	130.0	29.6	<b>587.3</b>
Kilimanjaro	3.0	0.8	250.4	165.7	113.9	50.8	10.7	15.3	5.8	1.6	37.3	4.2	<b>659.5</b>
Moshi	20.8	0.6	229.8	393.4	91.7	72.8	14.9	24.9	13.6	1.7	71.4	23.1	<b>958.7</b>
Tanga	5.5	8.8	208.2	227.3	274.3	145.3	127.3	118.8	69.0	71.3	102.7	8.6	<b>1,367.1</b>
Same	28.2	15.8	127.1	77.0	40.7	27.5	7.2	27.5	2.7	5.7	182.0	25.3	<b>566.7</b>
Karume	58.3	1.5	271.6	514.6	502.0	186.6	78.3	59.8	28.0	36.4	67.2	60.4	<b>1,864.7</b>
Kisauni	65.8	51.1	194.0	311.5	179.5	158.3	55.4	80.9	31.3	17.0	249.4	120.3	<b>1,514.5</b>
D'salaam	26.4	112.6	220.6	267.1	148.0	79.8	60.8	22.2	13.5	27.2	115.0	173.8	<b>1,267.0</b>
Morogoro	8.3	29.0	186.2	202.7	89.8	27.5	38.7	21.6	16.1	11.5	33.6	60.7	<b>725.7</b>
Mtwara	180.3	170.3	168.7	240.5	48.5	31.5	7.8	2.1	23.3	1.1	52.1	74.3	<b>1,000.5</b>
Dodoma	137.2	49.9	226.2	73.3	0.1	0.0	0.0	0.0	0.1	0.0	0.0	114.8	<b>601.6</b>
Tabora	137.4	50.3	301.1	34.8	2.4	0.0	0.0	1.8	3.0	0.0	203.5	46.7	<b>781.0</b>
Kigoma	88.6	46.7	191.9	114.0	0.0	0.0	0.0	21.9	0.8	71.6	273.9	113.3	<b>922.7</b>
S'bawanga*	137.7	86.3	219.8	105.1	7.4	1.1	0.0	9.6	0.0	10.7	25.2	96.9	<b>699.8</b>
Iringa	115.4	104.8	190.4	35.7	0.0	0.5	0.0	0.0	0.0	0.0	1.0	70.5	<b>518.3</b>
Mbeya	327.0	116.1	330.3	125.2	52.6	2.5	0.0	4.9	2.1	3.1	12.1	144.7	<b>1,120.6</b>
Songea	128.1	125.1	396.3	168.4	15.3	0.0	0.0	2.0	2.7	2.8	10.0	83.9	<b>934.6</b>

Source : Directorate of Meteorology, Ministry of Communications and Transport

\* Sumbawanga

**Table 3.5: Monthly Rainfall (in mm) for the Year 2000**

Station/Month	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bukoba	52.2	90.7	115.7	199.2	212.8	39.2	48.2	69.8	77.7	130.2	234.2	223.4	<b>1493.3</b>
Mwanza	88.7	41.0	51.0	67.6	14.1	5.9	0.0	0.0	0.0	69.9	129.8	-	<b>468.0</b>
Musoma	11.8	37.1	122.7	106.4	41.9	9.4	0.0	43.8	15.2	39.2	88.6	190.3	<b>706.4</b>
Arusha	38.2	26.7	44.3	144.3	30.8	10.5	3.3	15.8	4.0	0.0	101.4	104.3	<b>523.6</b>
K'njaro A/P	10.0	3.1	13.8	41.4	52.0	22.2	4.2	15.9	11.5	1.1	123.3	46.4	<b>344.9</b>
Moshi A/P	1.4	2.0	121.4	121.9	54.1	27.0	4.4	15.3	2.2	6.0	16.9	29.0	<b>401.6</b>
Same	0.0	0.4	104.3	60.2	38.5	40.1	1.1	4.9	17.6	2.1	56.5	26.4	<b>352.1</b>
Karume	7.4	0.0	157.5	369.9	19.9	82.7	35.4	0.7	13.6	14.7	76.6	104.0	<b>882.4</b>
Zanzibar	1.4	0.0	270.9	352.0	86.9	195.9	40.6	4.4	35.3	6.2	191.1	217.0	<b>1401.7</b>
D'salam	1.8	3.5	108.4	261.2	70.0	126.9	18.7	24.0	3.2	6.2	79.2	220.0	<b>923.1</b>
Morogoro	68.8	37.9	183.0	110.3	47.8	48.0	5.2	0.3	4.9	0.0	49.5	205.0	<b>760.7</b>
Mtwara	127.6	60.3	360.5	72.4	54.9	25.1	28.7	16.6	20.3	10.1	97.1	154.1	<b>1027.7</b>
Dodoma	126.0	85.9	172.5	35.8	0.0	0.0	0.0	0.0	0.0	0.0	60.7	274.0	<b>754.9</b>
Tabora A/P	94.4	97.8	178.3	126.4	0.0	0.0	0.0	0.0	1.0	23.5	239.3	192.0	<b>952.7</b>
Kigoma	44.7	58.9	140.2	59.9	32.8	0.0	0.0	0.0	2.0	4.0	204.1	-	<b>546.6</b>
Iringa A/P	97.8	52.8	87.3	50.4	0.0	0.0	0.0	0.0	0.0	0.0	199.0	90.0	<b>577.3</b>
Mbeya A/P	147.3	174.0	205.5	70.1	0.0	0.0	0.0	0.0	0.0	0.0	163.0	259.0	<b>1018.9</b>
Songea A/P	191.4	162.7	189.3	120.6	11.4	1.0	0.0	3.1	0.0	0.0	111.8	248.0	<b>1039.3</b>
Tanga A/P	-	0.0	109.3	164.4	246.6	266.1	80.7	35.5	34.1	44.7	35.3	51.7	<b>1068.4</b>

Source: Food Security Department (Meteorological Unit), Ministry of Agriculture and Food Security 'A/P (Air Port)

**Table 3.6: Monthly Rainfall (in mm) for the Year 2001**

Station/Month	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bukoba	181.4	210.0	140.8	284.4	287.7	125.3	41.9	9.0	41.5	147.9	139.0	164.8	1773.7
Mwanza	210.6	113.5	72.3	164.2	25.2	1.6	25.4	38.3	31.1	104.7	219.6	139.6	1146.1
Musoma	74.0	34.9	271.2	207.7	129.1	21.8	32.7	19.0	16.2	98.5	89.7	24.3	1019.1
Arusha	225.1	23.5	178.9	108.5	47.7	16.9	0.0	3.0	0.4	0.2	43.3	55.7	703.2
K'njaro A/P	107.4	45.6	169.9	107.2	31.4	10.5	0.0	2.7	0.2	0.0	21.7	1.8	498.4
Moshi A/P	136.4	30.1	182.9	294.0	145.4	14.8	1.0	0.3	7.0	11.5	63.0	3.9	890.3
Same	121.9	14.4	42.4	127.0	15.0	62.6	0.0	0.0	0.2	0.0	45.7	42.6	471.8
Zanzibar	88.2	47.0	63.5	642.8	290.3	34.6	26.8	16.2	17.3	9.3	31.4	64.2	1331.6
D'salam	64.5	71.3	139.0	296.6	162.5	14.0	19.6	3.9	5.0	6.7	15.5	82.2	880.8
Morogoro	104.3	99.0	172.5	224.6	90.4	4.6	5.8	0.0	0.0	11.1	0.0	71.7	784.0
Mtwara	298.9	155.6	244.7	124.8	11.0	0.0	7.2	9.9	5.0	56.4	12.8	99.4	1025.7
Dodoma	312.5	45.4	47.0	85.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	103.0	593.3
Tabora A/P	175.9	201.2	171.5	92.0	18.1	0.0	27.7	0.3	0.6	40.1	66.4	285.1	1078.9
Kigoma	161.5	59.6	228.3	31.0	39.0	17.7	0.5	22.0	30.6	64.1	71.4	91.0	816.7
Iringa A/P	437.6	247.4	184.4	33.6	6.0	0.0	0.0	1.3	4.2	0.0	6.2	229.2	1149.9
Mbeya A/P	451.3	106.5	103.0	95.6	24.1	0.0	0.0	0.0	8.6	21.6	33.3	175.4	1019.4
Songea A/P	269.1	118.5	290.5	52.4	20.4	0.0	0.0	0.0	1.3	0.0	10.4	127.9	890.5
Tanga A/P	39.1	28.5	53.4	157.7	204.7	122.6	17.1	25.0	7.2	24.3	57.9	76.3	813.8
Pemba	44.9	44.2	50.1	755.9	226.1	86.4	35.1	20.5	0.5	3.5	19.2	100.2	1386.6
Shinyanga	109.4	100.8	140.1	84.8	25.6	0.0	1.4	0.0	8.3	55.0	44.1	177.5	747.0
Sumbawanga	302.8	159.3	186.4	110.6	54.3	2.1	0.0	0.0	15.6	10.5	49.1	152.1	1042.8

Source : Directorate of Meteorology, Ministry of Communications and Transport

**Table 3.7: Monthly Rainfall (in mm) for the Year 2002**

Station/Month	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bukoba	97.5	103.3	440.8	428.3	62.3	23.5	14.2	28.5	92.0	175.0	267.5	174.5	1907.4
Mwanza	140.4	68.0	240.5	206.1	122.6	0.0	0.0	0.0	1.1	61.1	143.0	299.2	1282.0
Musoma	64.7	19.4	165.2	167.1	164.6	18.2	17.2	5.5	24.5	49.1	165.3	209.0	1069.8
Arusha	124.8	136.3	151.6	220.2	42.3	7.6	1.6	15.8	43.0	97.8	36.8	131.9	1009.7
K'njaro A/P	89.4	66.3	101.6	162.4	27.1	2.5	0.7	25.6	19.2	110.3	49.0	134.2	788.3
Moshi A/P	69.5	21.7	177.8	490.0	71.8	1.6	3.7	39.8	116.2	72.3	27.1	129.0	1220.5
Same	67.7	55.5	88.8	58.1	4.8	0.0	0.0	28.9	30.8	171.0	48.4	114.0	668.0
Zanzibar	123.1	144.6	109.6	705.4	78.3	19.4	87.6	104.6	77.7	133.8	204.9	176.4	1965.4
D'salam	97.5	103.3	440.8	428.3	62.3	23.5	14.2	28.5	92.0	175.0	267.5	174.5	1907.4
Morogoro	35.6	116.8	187.4	264.6	24.6	1.1	4.9	8.7	13.6	70.2	60.5	157.1	945.1
Mtwara	361.3	193.1	332.3	176.7	4.0	7.6	2.4	40.8	48.4	4.5	172.6	245.6	1589.3
Dodoma	285.0	97.6	71.3	4.6	2.5	0.0	0.0	0.0	0.0	1.5	0.0	187.5	650.0
Tabora A/P	145.7	100.8	224.9	142.4	80.2	0.0	0.0	0.0	0.0	39.5	66.4	228.5	1028.4
Kigoma	289.7	26.3	167.8	233.0	4.3	0.0	0.0	0.0	0.0	29.0	186.4	106.3	1042.8
Iringa A/P	170.6	92.0	178.0	20.1	3.8	0.0	0.0	0.0	0.0	0.0	4.4	141.4	610.3
Mbeya A/P	191.5	182.7	152.0	61.4	0.0	0.0	0.0	0.0	0.8	3.2	21.4	153.9	766.9
Songea A/P	360.0	192.8	298.0	116.3	1.7	2.0	0.0	0.0	0.2	1.1	87.2	198.3	1257.6
Tanga A/P	41.8	23.5	94.3	312.6	160.5	16.7	47.8	143.8	168.9	205.6	144.2	159.2	1518.9
Pemba	49.7	7.6	68.4	472.7	108.2	53.9	67.8	55.7	121.6	68.5	79.9	160.4	1314.4
Shinyanga	200.1	96.5	185.3	125.5	31.5	0.0	0.0	8.0	0.0	79.9	134.6	109.7	971.1
Sumbawanga	236.2	110.2	170.6	91.5	4.3	0.0	0.0	0.0	0.0	0.0	89.3	116.7	818.8

Source : Directorate of Meteorology, Ministry of Communications and Transport

**Table 3.8: Monthly Rainfall (in mm) for the Year 2003**

Station/Month	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bukoba	118.5	33.0	240.5	237.5	185.7	120.0	99.0	81.4	117.4	92.2	241.1	108.7	1675.0
Mwanza	44.7	20.1	186.0	154.1	86.2	0.5	13.0	21.1	6.4	21.8	85.8	251.3	891.0
Musoma	0.4	0.7	93.8	180.3	130.5	38.8	18.3	33.1	16.1	19.7	59.6	60.3	651.6
Arusha	33.0	49.2	53.0	39.4	128.3	17.3	2.8	0.1	7.3	22.9	18.1	77.2	448.6
K'njaro A/P	9.7	14.6	18.4	40.8	188.9	12.2	3.8	0.0	5.0	2.1	0.0	43.1	338.6
Moshi A/P	3.7	10.1	62.0	159.4	191.4	53.8	9.7	2.8	0.4	0.0	1.1	19.0	513.4
Same	8.5	66.2	56.1	31.3	85.5	11.6	0.0	1.8	0.0	0.5	47.4	23.5	332.4
Zanzibar	4.1	3.0	44.7	32.4	209.7	38.4	42.3	15.3	17.2	108.7	88.5	75.1	679.4
D'salam	20.1	22.2	122.4	13.7	130.8	109.5	26.1	0.9	3.5	22.4	89.2	24.6	585.4
Morogoro	63.0	30.5	162.3	54.5	51.2	13.2	11.4	0.0	0.0	55.2	4.3	50.1	495.7
Mtwara	141.3	111.5	92.2	51.8	32.4	0.0	0.0	2.4	1.5	2.2	6.5	39.8	481.6
Dodoma	90.4	68.2	51.9	7.7	17.8	0.0	0.0	0.0	0.0	76.2	0.6	175.5	488.3
Tabora A/P	186.7	113.2	80.0	159.4	38.7	0.0	0.0	0.0	13.0	32.5	76.8	136.1	836.4
Kigoma	164.7	153.1	161.0	170.9	6.5	8.3	0.0	3.8	22.0	73.0	91.8	84.8	939.9
Iringa A/P	156.9	93.6	58.1	44.0	14.3	0.0	0.0	0.0	0.0	13.5	2.4	93.5	476.3
Mbeya A/P	247.7	111.2	167.0	43.5	0.0	0.0	3.4	0.0	0.0	16.6	80.7	146.3	816.4
Songea A/P	160.3	226.1	254.6	67.2	12.8	0.0	0.0	0.0	0.0	0.0	22.9	217.5	961.4
Tanga A/P	0.6	0.0	6.1	43.2	285.8	36.9	27.0	53.3	39.3	104.0	86.2	10.4	692.8
Pemba	17.6	1.5	45.2	130.6	472.3	49.7	71.3	28.1	23.8	92.9	3.1	22.0	958.1
Shinyanga	159.7	14.4	106.9	171.6	58.5	0.0	0.0	2.7	3.8	27.1	24.2	86.1	655.0
Sumbawanga	172.2	24.2	112.7	62.0	10.9	3.3	4.1	0.0	0.0	0.0	28.1	203.0	620.5

Source : Directorate of Meteorology, Ministry of Communications and Transport

**Table 3.9a: Types of Irrigation, priority Areas and Regions/for development**  
(as at March 2001)

Strategy	Type of Irrigation	Region	Area (Ha)
Rehabilitation of Traditional Schemes	Traditional Irrigation Schemes	Mbeya	33,500
		Kilimanjaro	20,000
		Arusha	15,600
		Pwani	13,100
<b>Sub-Total</b>			<b>82,200</b>
Rain Water Harvesting	Rain Water Irrigation Programmes	Tabora	18,600
		Shinyanga	9,000
<b>Sub-Total</b>			<b>27,600</b>
Development Small-scale Irrigation Schemes	Small-holder Irrigation Programmes	Mbeya	14,500
		Kagera	10,900
		Mara	10,300
<b>Sub-Total</b>			<b>35,700</b>
Development Small-scale Irrigation Scheme	Small-holder Irrigation Programmes	Other areas	52,900
<b>Sub-Total</b>			<b>52,900</b>
<b>Grand Total</b>			<b>198,400</b>

Source: Irrigation Unit, Ministry of Agriculture and Food Security