



A DECENNIUM CLIMATE TRENDS

Hnahthial and its Satellite villages under NICRA Project



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A Decennium of Climate trend which has experienced in NICRA adopted and its satellite villages is hereby brought out by the KVK Lunglei District under the NATIONAL INNOVATION IN CLIMATE RESILIENT AGRICULTURE(NICRA) Project. This document provide details of climatic parameter viz, rainfall, temperature and humidity which is records in Automatic Weather Station (AWS) and Village Weather Station.

The team of NICRA express their gratitude to Director, CRIDA, Hyderabad, Director, ATARI VII, Umiam, Director, Agriculture and Farmer Welfare. Govt.of Mizoram for their support and guidance in bringing out this publication.

We do hope that this will serve as an extremely useful to all users and also serve as an important indicators for the stakeholders. Suggestion for its improvement are always welcome for future publication

**Team of NICRA
KVK Lunglei District
Mizoram;Hnahthial**



Introduction : Hnahthial and its satellite villages - Tuipui D, Thiltlang, South Vanlaiphai under the NICRA Project are located in the southern part of Mizoram under Lunglei District. Its geographical area covers about 185 sq.Km. It lies between 22⁰5'20"N-23⁰12'10' N and - 92⁰50'10"E - 93⁰10'10"E. The altitude ranges from 288 msl to 1280 msl. The adopted village and its satellite villages are falls under agro-climatic condition of Humid Sub tropical Hill zone .The villages are drained by three rivers- Chhimtuipui, Tuichang ,Mat and its tributaries. Most of the soil are acidic in nature due to heavy rainfall and rugged topography. It contain high amount of organic carbon and are therefore high in Nitrogen content, low in phosphorus and Potash content. Due to the steepness of topography of the villages except flat land in S.Vanlaiphai, underground water retention is minimal ,causing perennial water sources to dry up during pre and post monsoon season. These has been aggravated by the the tradition of Jhum cultivation, commonly known as *slash and burn* .The habit of felling trees and foliage of forest and burning them really destroy the natural vegetation and thus causing ecological imbalance. In the villages vulnerable climate change i.e. temperature variability, humidity and erratic rainfall pattern. Small patches of Wet land rice cultivation are practiced in the village of Hnahthial and South Vanlaiphai. During Rabi season vegetables like Cabbage, Tomato Mustard, Chillies etc are cultivated in scattered manner. In general double cropping is not practiced due to lack of facility and insufficient water during the dry season. Banana. Pineapple and Mango are the main fruits grown in the villages. Others cultivated crops are Maize, Ginger, Cow pea and Brinjal.

Hnahthial and its satellite villages comes under the direct influence of South West Monsoon as such it generally receives an adequate amount of rainfall. The rainy season generally start from the month of April, it then heavily from May to September and lasted till late October. The winter season i.e. November to February is generally dry and cold and this season received very little rainfall.



Slash and Burn of Jhum land



Automatic Weather Station at Hnahthial

CULMINATION OF WEATHER :

1. The average total annual rainfall during (2011-2023) was 1750 mm
2. Automatic Weather Station at NICRA adopted village Hnahthial for collecting weather information.
3. There are two(2) Village Weather Station :Tuipui D and South Vanlaiphai were installed under NICRA Project.
4. The average month with receiving highest rainfall - **July**
5. The average month receiving lowest rainfall – **January**
6. The average hottest month – **April**
7. The average coldest month - **Jaunuary**



Village Weather Station in Tuipui D.



Paddy field during rainy season in S.Vanlaiphai



Village Weather Station in South Vanlaiphai



Tuipui River during rainy season

CLIMATE DATA OF NICRA VILLAGE-HNAHTHIAL,LUNGLEI DISTRICT

2011

MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	3	5	22	35	100
February	2	10	28	30	89
March	59	13	30	28	98
April	100	17	31	25	100
May	321	19	30	48	100
June	405	20	27	67	100
July	375	20	28	59	100
August	323	21	28	42	100
September	331	20	27	54	100
October	151	17	27	61	100
November	10	12	26	67	100
December	3	7	24	33	85
TOTAL	2083				

SOURCE: AWS/SWS NICRA.Hnahthial

2012

MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	0	7	24	34	98
February	0	11	28	31	88
March	77	13	32	29	100
April	104	17	32	23	100
May	206	18	32	48	100
June	425	20	32	68	100
July	371	20	30	58	100
August	288	21	30	65	100
September	205	19	28	52	100
October	158	17	28	63	100
November	5	12	27	64	98
December	0	6	25	32	86
TOTAL	1835				

SOURCE: AWS/SWS NICRA.Hnahthial

CLIMATE DATA OF NICRA VILLAGE-HNAHTHIAL,LUNGLEI DISTRICT

2013

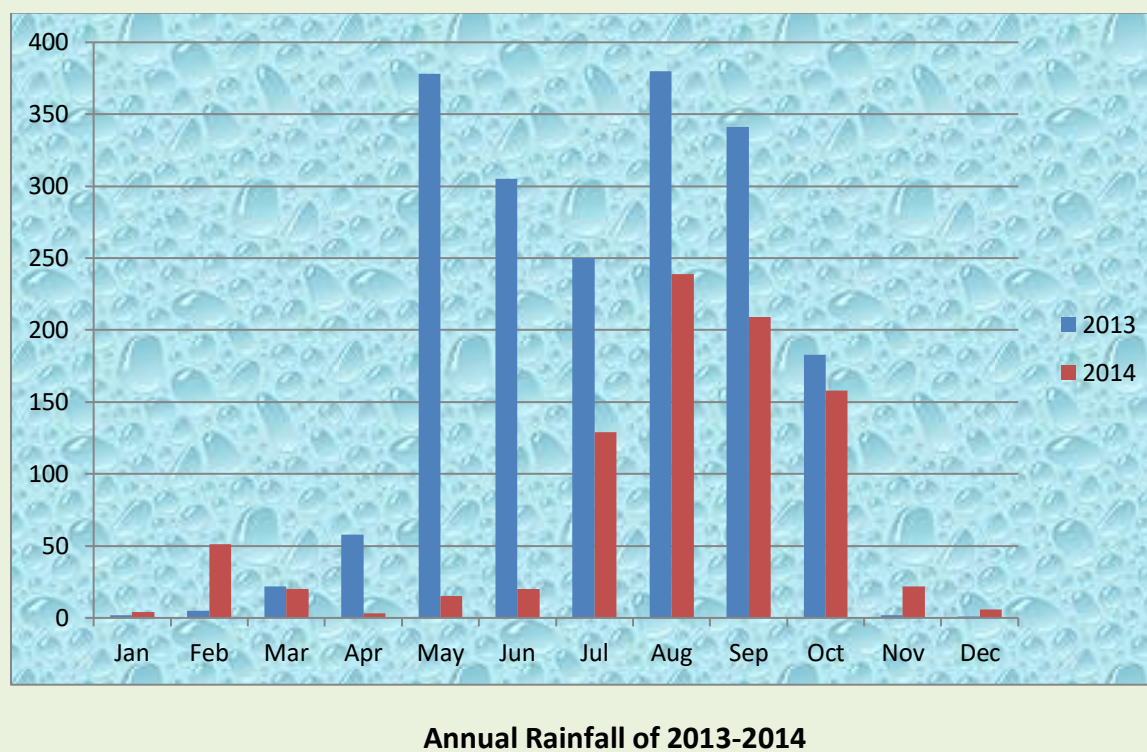
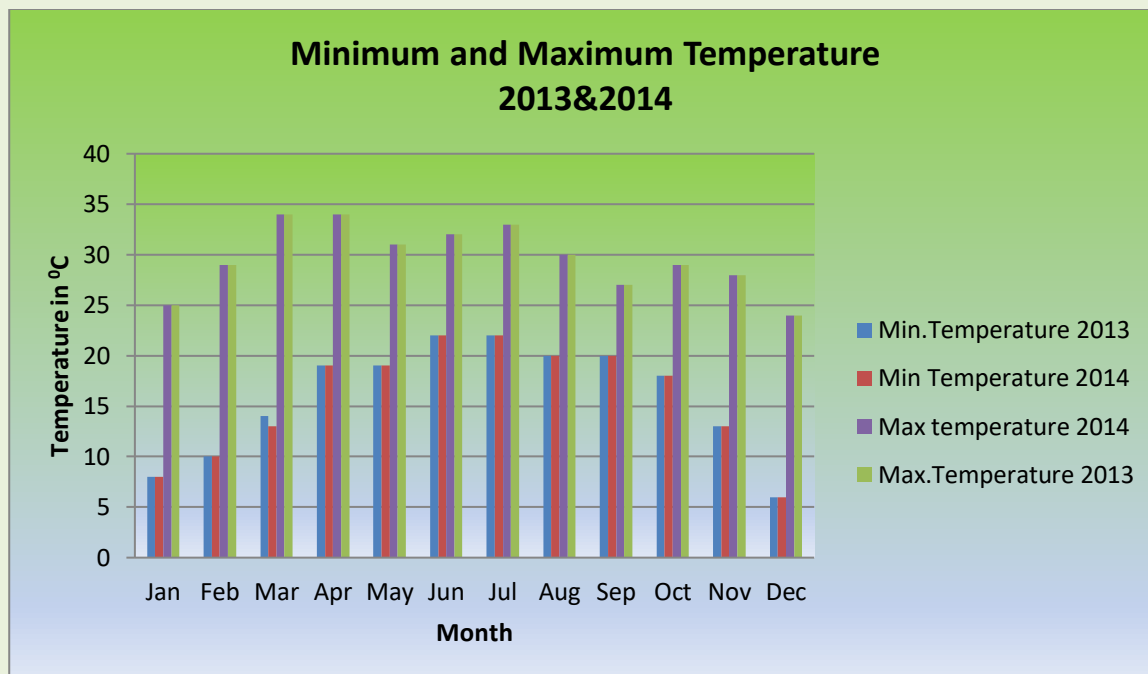
MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	2	8	25	34	91
February	5	10	29	31	99
March	22	14	34	29	85
April	58	19	34	23	94
May	378	19	31	48	100
June	305	22	32	68	100
July	250	22	33	58	100
August	380	20	30	65	100
September	341	20	27	52	100
October	183	18	29	63	100
November	2	13	28	64	84
December	1	6	24	32	86
TOTAL	1927				

SOURCE: AWS/SWS NICRA.Hnahthial

2014

MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	4	8	25	32	100
February	51	10	29	30	98
March	20	14	34	21	100
April	3	19	34	21	78
May	15	19	31	51	87
June	129	22	32	65	100
July	239	22	33	67	100
August	258	20	30	71	100
September	209	20	27	63	100
October	158	18	29	64	100
November	22	13	28	75	99
December	6	6	24	47	96
TOTAL	1114				

SOURCE: AWS/SWS NICRA.Hnahthial



CLIMATE DATA OF NICRA VILLAGE-HNAHTHIAL,LUNGLEI DISTRICT

2015

MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	3	6	26	32	100
February	2	11	30	30	96
March	15	13	33	21	100
April	40	20	33	21	100
May	310	19	30	51	100
June	342	21	32	65	100
July	287	20	32	67	100
August	264	19	30	71	100
September	320	19	29	63	100
October	112	17	27	64	100
November	20	12	27	75	100
December	1	6	24	47	91
TOTAL	1716				

SOURCE: AWS/SWS NICRA.Hnahthial

CLIMATE DATA OF NICRA VILLAGE-HNAHTHIAL,LUNGLEI DISTRICT

2016

MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	0	8	25	28	100
February	2	10	29	32	88
March	60	14	34	22	100
April	96	19	34	20	100
May	214	19	31	48	100
June	250	22	32	60	100
July	247	22	33	61	100
August	312	20	30	63	100
September	335	20	27	60	100
October	241	18	29	58	100
November	120	13	28	55	100
December	9	6	24	48	98
TOTAL	1887				

SOURCE: AWS/SWS NICRA.Hnahthial

CLIMATE DATA OF NICRA VILLAGE-HNAHTHIAL,LUNGLEI DISTRICT

2017

MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	0	7	28	32	100
February	8	11	29	30	100
March	54	13	33	54	100
April	124	16	34	21	100
May	118	17	33	53	100
June	237	20	32	52	100
July	395	19	33	52	100
August	469	17	30	71	100
September	313	16	29	60	100
October	206	15	29	64	100
November	55	13	28	50	100
December	0	6	28	43	98
TOTAL	2020				

SOURCE: AWS/SWS NICRA.Hnahthial

CLIMATE DATA OF NICRA VILLAGE-HNAHTHIAL,LUNGLEI DISTRICT

2018

MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	0	5	29	32	100
February	3	10	30	30	92
March	48	13	33	54	100
April	96	16	34	21	100
May	368	18	34	53	100
June	433	20	36	58	100
July	284	19	33	52	100
August	169	17	33	71	100
September	128	16	29	60	100
October	68	15	29	64	100
November	35	13	28	55	100
December	5	6	28	47	97
TOTAL	1638				

SOURCE: AWS/SWS NICRA.Hnahthial

CLIMATE DATA OF NICRA VILLAGE-HNAHTHIAL,LUNGLEI DISTRICT

2019

MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	0	5	29	35	100
February	3	11	29	30	89
March	25	15	31	28	100
April	75	19	33	25	100
May	95	22	38	48	100
June	320	19	34	67	100
July	257	20	33	59	100
August	370	18	33	42	100
September	365	18	30	54	100
October	185	15	30	62	100
November	65	11	30	67	100
December	5	7	29	32	84
TOTAL	1765				

SOURCE: AWS/SWS NICRA.Hnahthial

CLIMATE DATA OF NICRA VILLAGE-HNAHTHIAL,LUNGLEI DISTRICT

2020

MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	0	5	29	35	100
February	0	11	29	30	85
March	4	16	32	28	100
April	45	19	33	25	100
May	215	22	38	48	100
June	398	19	34	67	100
July	257	20	33	59	100
August	205	18	33	42	100
September	237	18	30	54	100
October	184	15	30	62	100
November	32	11	30	67	100
December	0	7	29	32	84
TOTAL	1577				

SOURCE: AWS/SWS NICRA.Hnahthial



Excavation of farm pond inconvergence with MNREGS



Low cost rain water harvesting structure 'Jalkund'

CLIMATE DATA OF NICRA VILLAGE-HNAHTHIAL,LUNGLEI DISTRICT

2021

MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	0	7	27	37	100
February	0	8	30	38	86
March	15	13	34	41	98
April	46	14	36	28	100
May	69	17	37	54	100
June	246	19	34	67	100
July	204	20	33	59	100
August	210	19	33	42	100
September	275	18	32	44	100
October	114	17	30	52	100
November	3	13	29	40	100
December	37	11	29	32	100
TOTAL	1219				

SOURCE: AWS/SWS NICRA.Hnahthial

CLIMATE DATA OF NICRA VILLAGE-HNAHTHIAL,LUNGLEI DISTRICT

2022

MONTH	Rainfall in mm	Temperature in °C		Humidity in %	
		Min	Max	Min	Max
January	6	7	28	28	100
February	7	7	29	34	90
March	18	9	33	32	87
April	26	17	38	38	100
May	139	15	34	38	100
June	300	18	33	57	100
July	206	20	34	60	100
August	280	20	33	55	100
September	228	20	33	51	100
October	169	19	32	43	100
November	1	15	30	42	100
December	0	10	29	25	100
TOTAL	1380				

SOURCE: AWS/SWS NICRA.Hnahthial

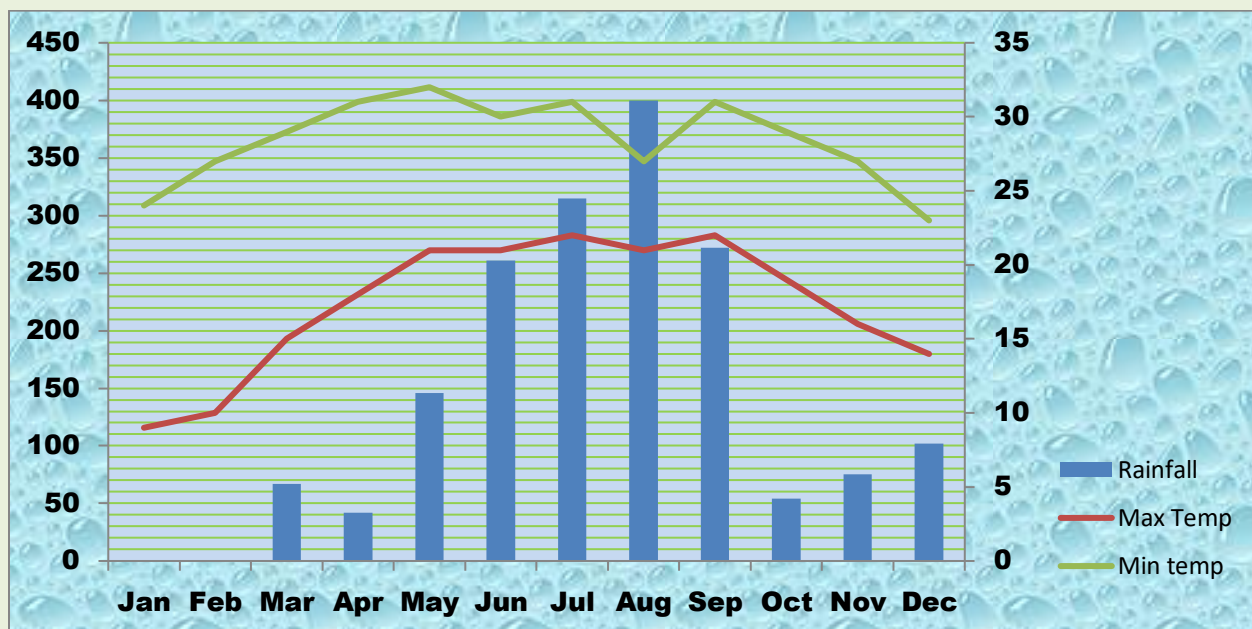
CLIMATE DATA OF NICRA VILLAGE-HNAHTHIAL,LUNGLEI DISTRICT

2023

MONTH	Rainfall in mm	Temperature in °C		Average Relative Humidity in %	
		Min	Max	Min	Max
January	0	7	28	33	93
February	0	9	29	27	84
March	67	13	34	31	79
April	43	15	36	33	83
May	146	16	36	42	88
June	261	18	35	65	100
July	315	22	34	63	100
August	401	19	32	81	100
September	272	21	34	64	100
October	54	15	31	60	100
November	75	13	30	54	100
December	102	8	28	58	100
TOTAL	1736				

SOURCE: AWS/SWS

NICRA.Hnahthial

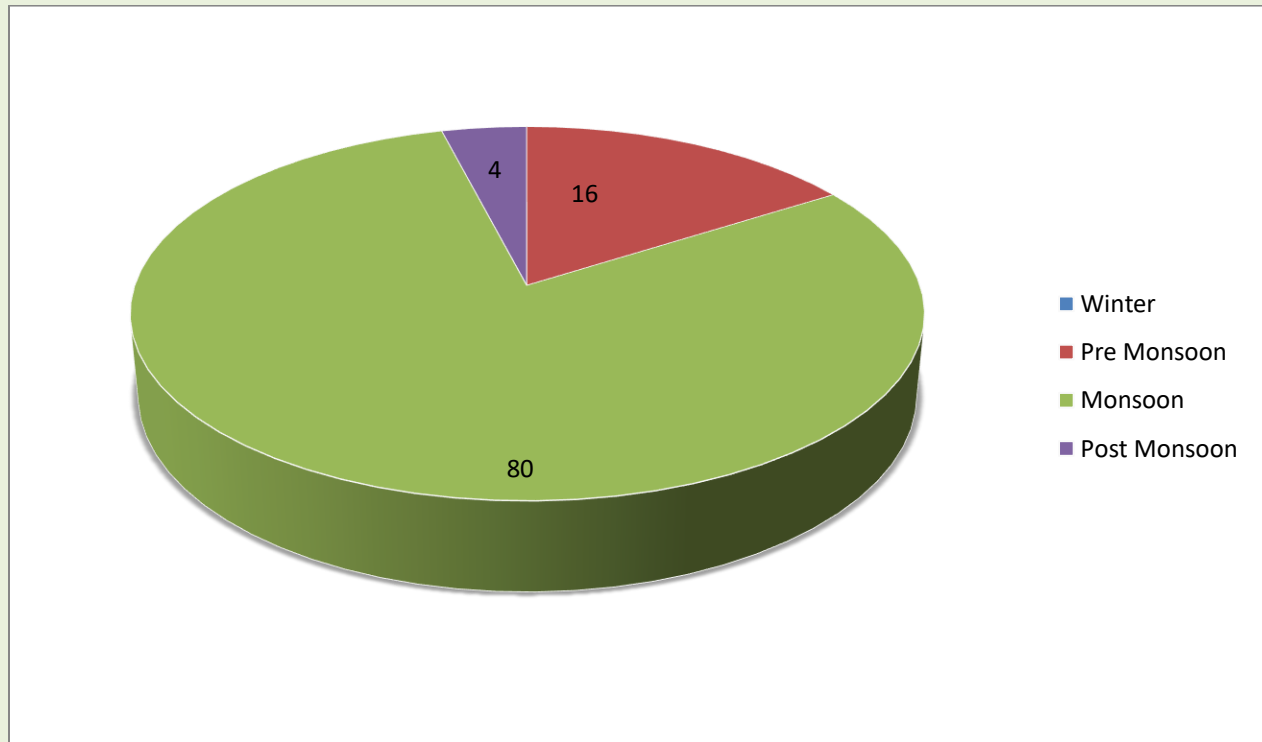


Average Rainfall, Min and Max Temperature during 2023

Daily Rainfall .2023

Day	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1	0	0	0	11.5	0	23.5	5.5	0	1.5	6.5	0	0
2	0	0	0	7.5	0	1.5	0	6	40.5	8.5	0	0
3	0	0	0	2.5	0	0	0.5	0.5	10	2.5	0	0
4	0	0	0	0	0	1	1	9.5	1.5	2	0	0
5	0	0	0	0	0	0	9.5	19	0	0	0	0
6	0	0	0	0	0	9.5	12.5	41	6	0	0	1.5
7	0	0	0	0	0	13.5	0	51.5	0.5	2.5	0	12
8	0	0	0	0	0	0	0.5	32	5.5	0	0	87.5
9	0	0	0	0	0	2	1	23	2.5	0	0	1.5
10	0	0	0	0	0	57	16.5	2	28.5	0	0	0
11	0	0	0	0	0	4.5	0	1	0	0	0	0
12	0	0	0	0	0	4.5	10.5	34.5	2	0	0	0
13	0	0	0	0	11.5	0.5	5	1	10.5	3	0	0
14	0	0	0	0	14.5	22	14	2	12.5	0	0	0
15	0	0	5	0	17	0	5.5	51	19	0	0	0
16	0	0	0	0	25.5	36	0.5	0.5	1.5	0	0.5	0
17	0	0	0	0	28	1.5	12.5	0	3.5	0	23	0
18	0	0	0	0	2	2	0	0	2.5	0	51.5	0
19	0	0	0	0	2.5	4	1	0	35	0	0.5	0
20	0	0	2.5	0	0	9.5	25	14	22	0	0	0
21	0	0	27	8.5	0	0	6.5	18	9	0	0	0
22	0	0	4	11.5	0	46	15	0.5	0.5	0	0	0
23	0	0	0.5	0.5	0	1.5	47.5	11	0	1.5	0	0
24	0	0	0	0.5	0	0.5	31	11.5	0	15.5	0	0
25	0	0	0	0	0	0	2	26.5	3	12	0	0
26	0	0	0	0	10	0	66	25.5	12.5	5.0	0	0
27	0	0	0	0	0	2.5	18	13	40.5	0	0	0
28	0	0	0	0	0.5	8.5	1.5	0	0	0	0	0
29	0		0	0	0	7.5	3.5	5.5	1.5	0	0	0
30	0		0.5	0	0	2.5	1	0	0	0	0	0
31	0		27.5		39.5		2	0		0		0
TOTAL			67	42.5	146	261	315	400.5	272	54	75	102

Seasonal distribution of Rainfall (in %).2023

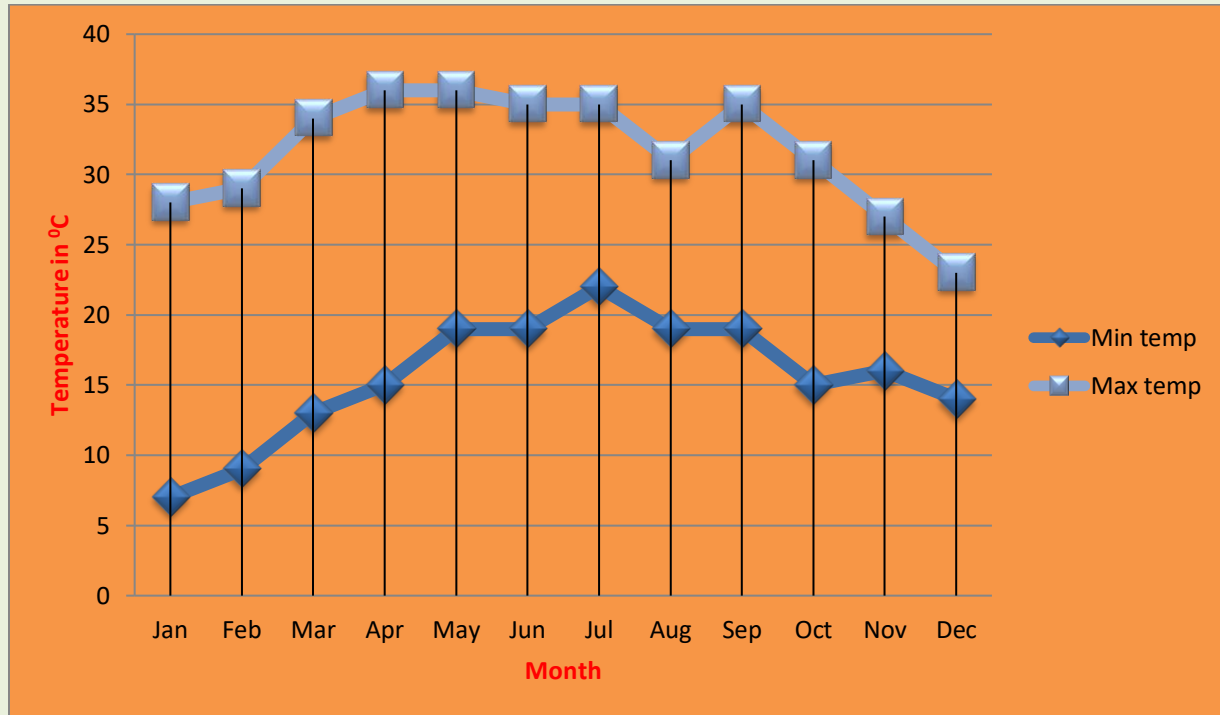


Thunderstorm on the onset of Monsoon in Hnahthial

Hnahthial Daily Temperature (°C).2023

Day	Jan Min Max	Feb Min Max	Mar Min Max	April Min Max	May Min Max	June Min Max	July Min Max	Aug Min Max	Sept Min Max	Oct Min Max	Nov Min Max	Dec Min Max
1	07-22	12-28	13-31	15-18	20-34	20-30	22-31	23-32	23-31	21-30	19-31	15-28
2	07-21	16-26	13-31	15-27	19-32	20-32	22-33	23-26	23-30	22-27	20-30	16-28
3	07-23	11-29	14-31	15-24	18-28	22-33	23-30	21-25	22-30	21-30	16-30	17-27
4	09-23	10-28	14-31	15-28	21-27	22-33	23-31	22-23	22-34	21-31	17-28	16-25
5	10-24	11-26	14-31	17-27	20-34	22-35	23-33	19-23	22-30	20-31	17-27	18-22
6	10-25	09-24	14-32	18-28	22-33	21-35	23-30	21-22	22-33	21-28	17-30	17-19
7	10-24	09-25	15-31	16-30	21-36	21-30	22-30	22-24	23-30	21-31	15-28	18-22
8	11-24	10-25	15-29	17-31	20-36	22-33	22-31	22-23	23-31	21-30	17-28	19-24
9	11-24	11-26	15-30	17-32	21-36	22-31	22-30	22-27	22-30	21-30	15-27	17-26
10	11-24	10-27	16-31	18-32	22-36	21-25	22-25	22-25	21-28	20-30	14-29	16-25
11	11-24	11-26	16-30	18-34	22-36	21-25	22-30	22-28	23-32	22-30	15-28	15-23
12	09-24	11-27	16-34	19-35	20-35	21-29	22-29	21-24	22-31	21-28	16-28	14-25
13	09-23	12-27	16-34	18-35	20-23	23-31	22-31	22-29	22-32	20-28	16-29	18-25
14	08-22	10-26	16-31	20-36	17-22	22-30	22-30	22-29	21-28	20-30	18-29	15-23
15	09-20	09-27	17-31	20-36	16-26	23-25	22-32	22-29	21-31	18-30	19-29	11-23
16	07-22	09-27	13-30	20-36	19-29	18-23	22-31	22-27	23-34	18-30	20-20	9-23
17	07-22	11-25	16-28	20-36	18-30	22-30	22-30	22-30	23-35	17-31	18-18	8-24
18	07-22	11-28	16-29	21-35	18-25	20-28	22-35	23-30	23-29	16-30	19-29	8-24
19	06-22	13-28	17-30	20-35	17-29	19-30	23-33	23-31	22-32	17-31	19-28	10-25
20	06-24	14-28	16-29	22-35	22-31	21-29	23-33	22-25	22-30	18-31	19-30	12-25
21	08-25	14-28	13-21	17-30	20-33	22-32	23-30	22-27	22-29	20-31	19-23	13-23
22	08-24	13-29	15-23	17-31	21-33	21-30	22-32	21-24	21-30	19-23	18-28	12-24
23	08-24	14-27	13-28	18-28	21-31	22-33	23-34	22-29	22-33	19-20	14-28	13-26
24	10-26	13-28	15-28	18-30	21-26	22-30	22-34	21-30	22-30	19-25	14-27	15-26
25	10-27	13-29	14-28	17-33	19-31	22-32	22-34	21-30	22-33	20-30	13-28	16-24
26	10-25	14-29	15-29	19-32	20-31	22-32	22-32	21-24	22-34	19-28	14-27	14-24
27	11-26	12-28	18-26	19-35	21-32	22-30	22-30	21-23	22-32	18-28	14-28	14-24
28	11-27	13-29	17-28	21-32	19-32	22-31	22-30	21-30	23-33	18-29	15-26	12-26
29	10-27		15-25	21-35	21-35	20-32	22-30	22-31	22-30	15-29	14-24	13-25
30	11-28		14-29	20-34	20-34	22-26	23-33	22-31	22-28	17-30	15-27	13-24
31	11-28		14-26		20-34		22-33	23-30		19-31		12-23
Average	9-24	10-27	15-29	18-31	21-31	21-30	22-31	21-27	22-31	19-29	16-27	14-23

Minimum and Maximum monthly Temperature.2023



Awareness of Weather Station to Rural Youth

RAINFALL IN HNATHIAL (2011-2023)

Year	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	3	2	59	100	321	405	375	323	331	151	10	3	2083
2012	0	0	77	104	206	425	371	288	205	158	5	0	1835
2013	2	5	22	58	378	305	250	380	441	183	2	1	2027
2014	4	51	20	3	1	20	239	258	509	258	22	6	1108
2015	3	2	15	40	310	342	287	264	320	112	20	1	1716
2016	0	2	60	96	214	250	247	312	335	241	120	9	1886
2017	0	8	54	124	118	237	395	469	313	206	55	0	1979
2018	0	3	48	96	368	433	284	169	128	68	35	5	1638
2019	0	3	25	75	95	320	257	370	365	185	65	5	1765
2020	0	0	4	45	215	398	257	205	237	184	32	0	1577
2021	0	0	15	46	69	246	240	210	275	114	3	37	1219
2022	6	7	18	26	139	300	206	280	228	169	1	0	1380
2023	0	0	67	42	146	261	315	400	272	54	75	102	1734



JALKUND, A LOW COST RAIN WATER HARVESTING TECHNOLOGY FOR A HILLY FARMERS OF THE NICRA VILLAGES



Introduction

- The NICRA villages comprises of Hnathial, Thiltiang, Tulpui D, Thingsai, Cherhiun and Rawpui, has a total cultivated area of 344.7 Hectares.
- The average rainfall of the village is about 2100mm.
- The village receives high rainfall but lack of suitable rainwater and management lead to severe water scarcity during the post monsoon (November to March).
- Rain water storage and efficient use is the key to sustainable livelihood in the hills.
- Jalkund, a low-cost water harvesting structure is found suitable for the farmers in the villages.

Economics of Jalkund

Crops grown	Capacity/size	Total expenditure	Net profit	BC Ratio
Cabbage, Tomato, French bean, Mustard	30,000 ltr	15800	42,000	2.68:1



Soil Excavation



Placing Polythene (200 GSM)



Utilisation of Jalkund





National Initiative on Climate Resilient Agriculture





Heat stress management in Pig sty under NICRA



Awareness Program on Climate Resilient Crops in NICRA village

Projected changes of temperature of Mizoram (2021-2050):

- The entire state of Mizoram is projected to receive an increase in temperature above 1.6⁰C and less than 1.75 ⁰C
- The projected increase for annual average temperature for the northern most district of Kolasib is highest.
- The southern district are projected to have a lesser increase in average temperature than the northern district.

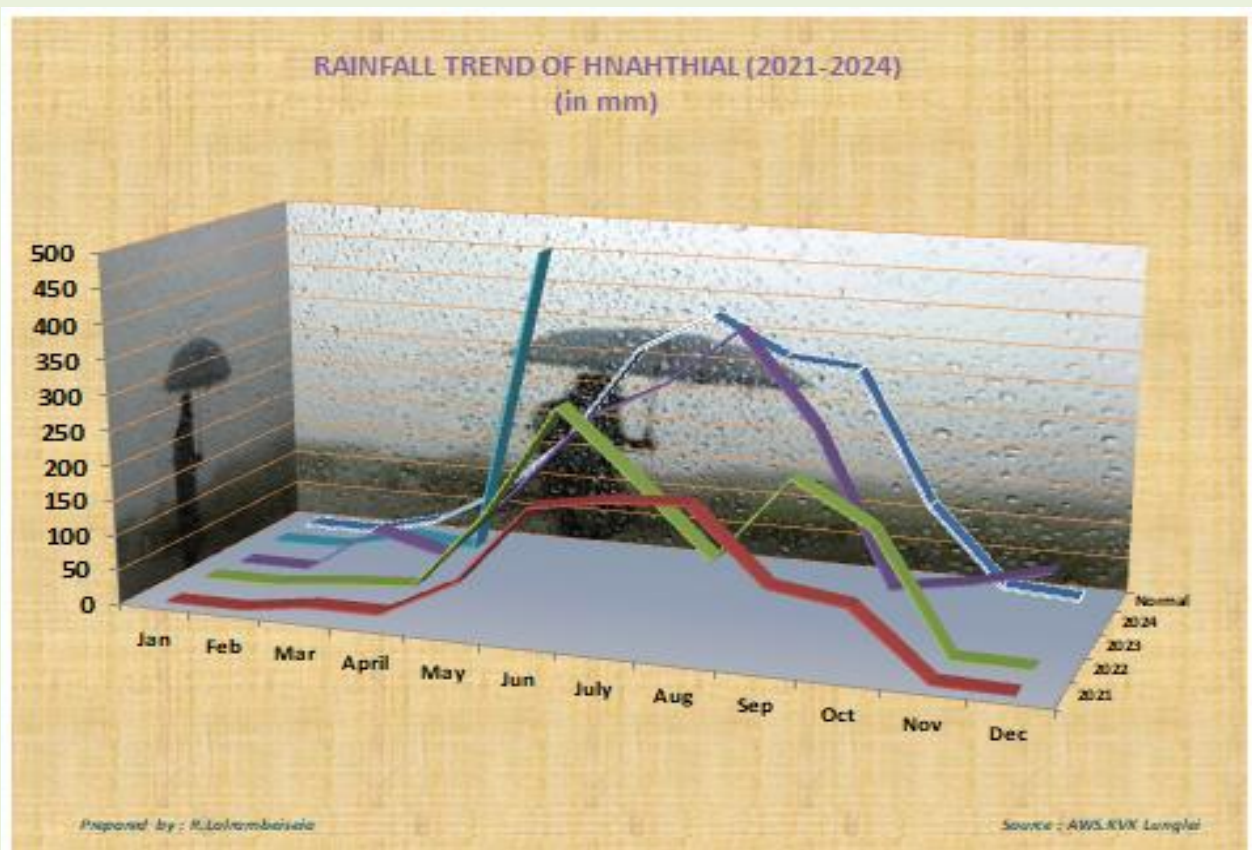


Low cost Poly House for off season crop

Conclusion:

NICRA adopted villages and its satellite villages experiences sub tropical monsoon weather characterized by a rainy season that lasts from June to September with a high temperature and humidity and a winter season with low temperature with dry climate ,which usually start from November to February. The villages experiences heavy rainfall during the rainy season and most of it falls in July to September. Dry ,warm days can also be expected in November and December.. NICRA adopted and its satellite villages experiences the climatic variability and also witnessed the global climate change in terms of increase of daily seasonal temperature and unseasonal rainfall. The minimum average temperature varied between 7.7⁰C in the month of January to 21.2 ⁰C in the month of July. The diurnal temperate are normally 15⁰C in winter and 10⁰ C in summer. The lowest temperature 5⁰ C was recorded in 2020 and the highest temperature 38⁰ C was recorded in 2022. During the Pre Monsoon season, rainfall generally start in the second week of March. Since 2020 due to the climatic variability rainfall are generally start in the last week of March. The total amount of rainfall are decreasing in Pre monsoon Season. Normally the monsoon rainfall is start from the 4th /5th of June .After 2018, the rainfall are generally late/early in 7 to 8 days. During the post monsoon season especially in the month of October ,the intensity and period of rainfall are increasing , sometime this impact on harvesting of paddy crops and delayed on transplanting of Rabi crops.The impacts of climate change

on rainfall pattern in the village s are a growing concern as rising temperature can lead to changes in precipitation and affect water availability for both agricultural and domestic use. Monitoring and analyzing rainfall data in adopted villages overtime can help to identify any shifts or trends in rainfall pattern and better inform local decision –making related to water management and crop planning .



The villages experiences drastical change of daily temperature especially in summer season. Normally, the average minimum temperature is 20⁰C and the average maximum temperature is 33⁰C .From 2019,the

average diurnal daily temperature of summer season season are 13⁰C.During the 13 years ,the maximum temperature recorded in 15 August 2019 is highest and can reached 38⁰C .In 2023 ,10 consecutive days i.e. 11th to 20th April, the temperature reached above 36⁰C.The relative humidity within this periods is ranges between 20% to 74%.The changing climate with its more extreme weather are affecting many plants and animal species and disrupting ecosystem in the village.