Heat Wave Action Plan

Year - 2024

District Disaster Management Authority (DDMA), Ferozepur, District Ferozepur, Punjab

Contents

Chapter-1

1. Introduction

Heat wave is associated with decreases in general population well-being and with increases in mortality and morbidity, especially in vulnerable population groups. Temperature thresholds for health impacts differ according to the region and season. The impact of heat wave has been considerably enough to threaten human health both directly and indirectly. The number of heat extremes has substantially increased across globe in recent decades. It is virtually certain that the length, frequency and intensity of heat waves will increase in the future. This increase will lead to a substantial increase in mortality over the next decades, especially in vulnerable population groups, unless adaptation measures are taken.

As per Annual 2023 Global Climate Report, the year 2023 was the warmest year since global records began in 1850 at 1.18°C (2.12°F) above the 20th century average of 13.9°C (57.0°F). This value is 0.15°C (0.27°F) more than the previous record set in 2016. The 10 warmest years in the 174-year record have all occurred during the last decade (2014–2023). Of note, the year 2005, which was the first year to set a new global temperature record in the 21st century, is now the 12th-warmest year on record.

1.1. Definition:

Heat wave is: Heat wave is a condition of atmospheric temperature that leads to physiological stress, which sometimes can cause deaths as well. The World Meteorological Organization defines a heat wave as five or more consecutive days during which the daily maximum temperature exceeds the average maximum temperature by five degrees Celsius. Different countries define heat wave differently in context of their local conditions. In India, as per IMD classification, heat wave is considered if maximum temperature of a station reaches at least 40°C or more for plains, 37°C or more for coastal stations and at least 30°C or more for hilly regions. Following criteria are used to declare a heat wave:

a) Based on Departure from Normal

- Heat Wave: Departure from normal is 4.5°C to 6.4°C
- Severe Heat Wave: Departure from normal is > 6.4°C

b) Based on Actual Maximum Temperature (for plains only)

- Heat Wave: When actual maximum temperature ≥ 45°C
- Severe Heat Wave: When actual maximum temperature ≥ 47°C

To declare a heat wave, the above criteria should be met at least at two stations in a Meteorological sub-division for at least two consecutive days. A heat wave will be declared on the second day.

The level of heat discomfort is determined by a combination of meteorological (temp, RH, wind, direct sunshine), social/cultural (clothing, occupation, accommodation) and physiological (health, fitness, age, level of acclimatization) factors. There will be no harm to the human body if the environmental temperature remains at 37° C. Whenever the environmental temperature increases above 37° C, the human body starts gaining heat from the atmosphere. If humidity is high, a person can suffer from heat stress disorders even with the temperature at 37°C or 38°C as high humidity does not permit loss of heat from human body through perspiration.

1.2. Purpose and Aim

DDMA, Ferozepur is the primary agency with responsibility for the hazard of heat wave in the District. The purpose of the Heat Wave Management Plan (this plan) is to outline the arrangements for the management of heat waves in district Ferozepur across preparedness, response and recovery. The aim of this plan is to enable the district to mitigate the effects of, prepare for, respond to, and recover from heat waves.

1.3. Necessity of Heat Wave Action Plan

There is a need of a coordinated multi-agency approach to the district's management of heat waves. At present, the problem of heat waves is being managed at an operational level but it needs to be managed at a strategic level. There is the need for clear roles and responsibilities in the management of heat waves, sufficient strategic monitoring, and greater clarity around triggers for activation and sharing of data across multiple systems and mapping or analysis of the extreme heat impacts across the community.

1.4. Objective of Action Plan on Heat Wave

I. The Heat Wave Action plan aims to provide a framework for implementation, coordination and evaluation of extreme heat response activities in cities/towns/panchayats that reduce the negative impact of extreme heat.

II. The Plan's primary objective is to alert those at risk of heat-related illness in places where extreme heat conditions either exist or are imminent, and to take appropriate precautions.

III. The Plan also calls for preparedness measures to protect livestock/animals as extreme heat causes significant stress to them as well.

IV. The heat wave action plan is intended to mobilize departments and communities against avoidable health problems during spells of very hot weather.

V. The Plan also intends to help early warning agencies as well as the media. Taking all administrative/preventive actions that need to be taken by multiple agencies.

1.5. Goals

Recurring / Regular Activities

I. Developing and Display of colour heat wave alerts and Do's and Don'ts in public domains such as hospital, offices, etc.

II. Multiple medium of communication (preferably in local languages) like TV, Radio and newspaper for awareness.

III. Identify and reduce awareness gap through disseminating of information using pamphlets, hoardings, LED display on advertisement boards.

IV. Change in timings of schools, colleges, offices, markets, etc.

Short-Term

I. Installing temporary kiosks for shelter, and distribution of water medicines, etc.

II. Developing mobile application for spreading awareness on heat-related issues and locating shelters, drinking water kiosks, etc.

III. Issuing advisories for locals and tourists.

IV. Setting up special cool shelters for "Wage Employment Programmes" such as Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGA).

V. Providing shade and drinking water for on-duty traffic personnel & other pedestrians.

Medium Term

I. Involving departments of the Government for collating local coping and adaptation strategies, indigenous technologies such as vernacular

building materials, construction of the green building, Energy Conservation Building Code (ECBC) etc. related to heat wave risk mitigation.

II. New heat wave criteria must be evolved based on gridded data with maximum and minimum temperature, to develop a scientific model to determine all-cause mortality.

III. Identify "heat hot-spots" in the District through appropriate tracking and modelling of meteorological data and promote the timely development and implementation of local Heat Wave Action Plan with strategic inter-agency co-ordination, and response which targets the most vulnerable groups.

Long Term

I. Training programmes in local level/ community level for awareness among people.

II. Yearly improvisation of heat wave plan through response and feedback data collection.

III. Operational forecast of maximum temperature over State in short, medium and extended range timescale is very useful in giving Heat Wave outlook.

IV. Upgradation of forecast system and associated equipments to provide heat wave alerts minimum of 2 to 3 weeks prior to the event.

V. Health-harming air pollution apportionment studies, emission inventories, and health impact assessment of ambient and household air pollution and use these findings to inform policies targeted at reducing the main sources of pollution via an inter-departmental approach.

VI. Evaluation of cascading effects of heat waves over flood, drought and hydrological models.

VII. Involvement of academia along with collaboration and more participation from higher educational institutes may be developed.

1.6. Key Strategies

Severe and extended heat waves can also cause disruption to general, social and economic services. Government agencies will have a critical role to play in preparing and responding to heat waves at the local level, working closely with health and related departments on a long-term strategic plan.

a) Establish Early Warning System and Communication System
b) Developing inter- agency response plan and coordination in field
c) Preparedness at the local level for health eventualities
d) Capacity building of health care system
e) Public awareness and community outreach
f) Collaboration with private, non-government and civil society
g) Assessing the impact- feedback for reviewing and updating the plan

Chapter-2

2.1. Physical Details of District Ferozepur

Ferozepur district constitutes a part of the Punjab Plains, which is largely flat and featureless and is formed of Pleistocene and sub-recent alluvial deposits of the Indo Gangetic system. Wind action has also played a part in shaping the relief of the district as it is in the vicinity of the Rajasthan desert. That is why the alluvial surface of the district is strewn with sand dunes in some parts. The general elevation of the district ranges from 230 meters in the northeast to about 175 meters in the southwest, giving northeast to southeast gradient of one meter in 4 km. The physiography of the desert is apparently a homogeneous plain in general. The following three terrain units can be identified:

1) The floodplain of the Sutlej,
2) The sand dune infested tract,
3) The Upland Plain.

2.2. Area

Ferozepur District has an area 5258.99 sq. km as supplied by the Surveyor General of India. Out of this area 5166.72 sq. km is rural whereas the remaining 92.27 sq. km is urban. The rural area of the district is derived by subtracting urban area of the district from the total district area, as supplied by the Surveyor General of India. The tehsil-wise area, as supplied by the Director Land Records, Punjab is as follows: Zira (1304.6 sq. km), Ferozepur (1284.6 sq. km) and Guruharsahai (2.45 sq. km).

2.3. Demography

According to Census of India 2011 Ferozepur district has a population of 10,01,918 comprising 5,29,601 males, 4,72,270 females and 47 others. A tehsil in Ferozepur on an average has a population of 3,49,221. Among the tehsil in the district, Ferozepur (5,66,857) is the most populated and Guruharsahai (1,41,465) the least populated tehsil. The district has a population density of 380 inhabitants per sq. km. Its population growth rate over the decade 2001–2011 was 16.08%. Ferozepur has a sex ratio of 893 females for every 1000 males, and a literacy rate of 69.8%.

2.4. Climate

The climate of Ferozepur district is, on the whole, dry and is characterized by very hot summer, a short rainy season and a bracing with winter. The

year may be divided into four seasons. The cold season is from November to March, followed by the summer season which lasts up to about end of June. The period from July to the middle of September constitutes the south-westerly monsoon season. The latter half of September and October may be termed as the post-monsoon or the transition period.

From about the end of March, the temperature increases rapidly till June which is generally the hottest month and on individual days, the maximum temperature may be about 47°C. However, with the onset of the monsoon by about end of June or early July, there is an appreciable drop in day temperature but the weather remains oppressive due to the increased moisture in July and August. By about the second week of September both day band night temperatures begin to fall, the drop in the night temperature being more than the day temperature. After October, both the day and night temperatures decrease rapidly till January, which happens to be the coldest month when the minimum temperature occasionally drops to about a degree of two below the freezing point of water.

The rainfall in the district generally increases from the south-west towards the north east. About 70% of the annual rainfall in the district is received during the period from July to September, July and August being the rainiest months. Some rainfall occurs during the pre-monsoon months, mostly in the form of thunder showers. In the winter season, some rainfall occurs under the influence of westerly disturbances. However, the variation in the rainfall from year to year is large.

2.5. Related Hazards

Extreme heat can help create the conditions for drought and can exacerbate the impacts of drought by putting additional stress on available water supplies. Extreme heat can also lead to increased storm activity, which is linked to both high wind and flash flood hazards. It can also contribute to the spread of wildfires.

2.6. Vulnerable Groups of Population

Extreme heat does not impact all people equally. Some people are more vulnerable to extreme heat and its impacts than others. It is important to identify the more vulnerable areas and populations of the District in order to establish priorities and minimum thresholds for heat alerts and activities. Incorporating information about vulnerable population groups within the city will help planners create effective, targeted strategies for reaching and

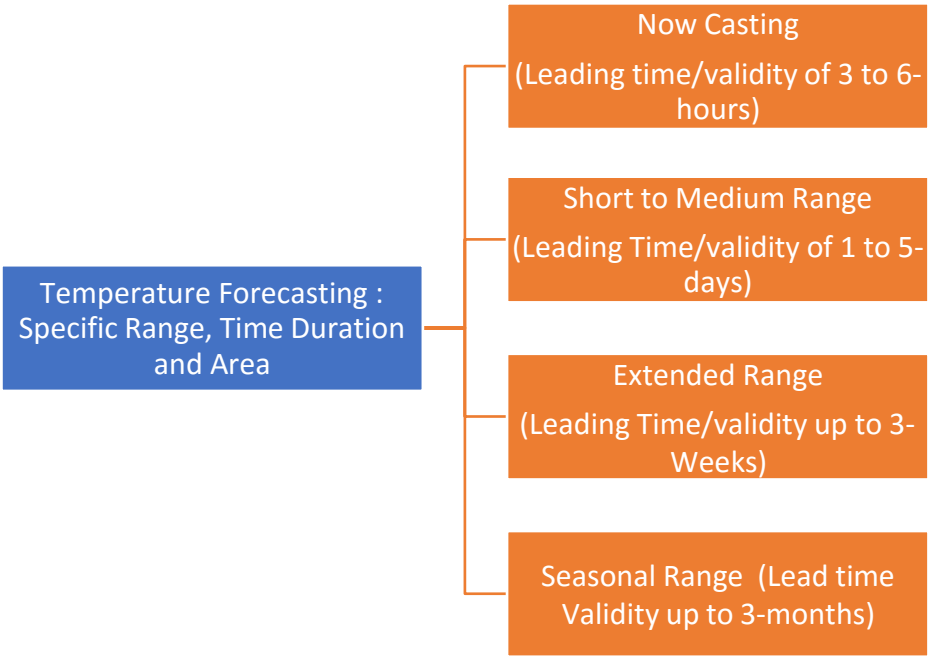
protecting these groups. This will make the heat action plan more robust and equitable for all of the District residents. Following may be considered as vulnerable groups:

a) Young children
b) Pregnant women & nursing mothers
c) Older people mainly above the age of 60
d) Below Poverty Line (BPL) families with no or poor housing conditions
e) Infirm, isolated, and destitute
f) People with pre-existing medical conditions (e.g., cardiovascular and respiratory illness, diabetes), people on certain medications
g) People with limited mobility, impairment of thermoregulatory capacity and reduced ability to perceive changes in temperature
h) People engaged in outdoor occupations (MNREGA)

Once people at risk have been identified special care and interventions need to be implemented through the local health care and social services. It is important that those who are susceptible can be easily identified for outreach services. Possible methods of identification include local community groups and social services and active registration of individuals with a general practitioners or social services.

Chapter-3
Early Warning and Communications

India Meteorological Department (IMD), Ministry of Earth Sciences, is the nodal agency for providing current and forecast weather information, including warnings for all weather-related hazards for optimum operation of weather-sensitive activities. It provides warning against severe weather phenomena like tropical cyclones, squally winds, heavy rainfall/snow, thunder-squall, hailstorm, dust storms, heat wave, warm night, fog, cold wave, cold night, ground frost, etc. It also provides real time data and weather prediction of maximum temperature, heat wave warning, extreme temperatures, and heat alerts for vulnerable cities/rural areas. IMD issues forecasts and warnings for all weather-related hazards in short to medium range (valid for the next five days) every day as a part of its multi-hazard early warning system:



3.1. Heat-Related Threshold

IMD gives a Heat Wave forecast particularly during the months from March to mid-June. The cut off temperatures for Heat Wave Forecast are:

- 40°C or more for plains,
- at least 30°C or more for hilly regions.

3.2. Identification of Colour Signals for Heat Alert

The Heat alerts based on thresholds determined by the IMD using the following colour signal system shall be issued:

Red Alert (Severe Condition)	**Extreme Heat for the Day**	**Normal Maximum Temp. increase 6°C to more**
Orange Alert (Moderate Condition)	**Heat Alert Day**	**Normal Maximum Temp. increases 4°C to 5°C**
Yellow Alert (Heat-Wave Warning)	**Hot Day**	**Nearby Normal Maximum Temp.**
White (Normal)	**Normal Day**	**Below Normal Maximum Temp.**

3.3. Heat Alert Warning System

Early warning systems can enhance the preparedness of decision-makers and their readiness to harness favorable weather conditions. Early warning systems for natural hazards is based both on sound scientific and technical knowledge. Accurate and timely alert systems are essential.

The IMD also provides warnings based on heat index (based on temperature and humidity). The reliability of these forecasts is up to a level of 85%. It disseminates information directly to Relief Commissioner (RC) and State Disaster Management Authority, Punjab all DDMAs along with various state agencies, Doordarshan, All India Radio (AIR) and other media houses by emails.

Heat Wave forecast is transmitted to Divisional Commissioners, District Commissioners and all other concerned authorities through email by State Control Room for alertness and preparedness for action. The warning is further transmitted to SSP, ADC/ADM, SP, SDMs, Tehsildars and all the heads of line departments through mass text and image message in the WhatsApp group. Department of Public and Relation disseminate of heat alerts/advisories, Do's and Don'ts in various district level as well local Punjabi/ Hindi/ English daily newspapers and other electronic media.

Chapter-4

Dealing with Heat related Illness, Mitigation and Preparedness

4.1. Dealing with Heat related Illness

Heat illness results when the body is out of heat balance. Heat balance means that the heat the body produces equals the heat it loses. When the body is out of heat balance, it produces and retains more heat than it loses causing heat illness. Heat illnesses range from heat rash and heat cramps to heat exhaustion and heat stroke. Heat stroke can result in death and requires immediate medical attention. Heat building-up inside the body from moving muscles during physical work activities is the major source of heat build- up in the body. The more strenuous the physical activity, the more internal heat the body produces. Performing physical work activities when risk factors for heat illness are present increases the internal heat the body produces.

Added to this internal heat is the external heat load on the body which comes from working where environmental risk factors (e.g., hot air, direct sunlight or lack of effective shading) are present. A major danger from warm and hot weather, high relative humidity and lack of air movement is that these factors greatly slow the body's natural processes of releasing heat to the surrounding environment. All of these and other risk factors can increase the risk of heat illness.

A graphic table below shows the temperature and humidity Index followed by NOAA, USA for assessing the level of Heat wave is as under:

Relative Humidity	**Temperature °C**																
	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
40	27	28	29	30	31	32	34	35	37	39	41	43	46	48	51	54	57
45	27	28	29	30	32	33	35	37	39	41	43	46	49	51	54	57	
50	27	28	30	31	33	35	36	38	41	43	46	49	52	54	58		
55	28	29	30	32	34	36	38	40	43	46	48	52	54	58			
60	28	29	31	33	35	37	40	42	45	48	51	55	59				
65	28	30	32	35	36	39	41	44	48	51	54	59					
70	29	31	33	35	38	40	43	47	50	54	58						
75	29	31	34	36	39	42	46	49	53	58							
80	30	32	35	38	41	44	48	52	57								
85	30	33	36	39	43	47	51	55									
90	31	34	37	41	45	49	54										
95	31	35	38	42	47	51	57										
100	32	36	40	44	49	56											
		Caution				Extreme Caution					Danger				Extreme Danger		

4.2. Prevention of Heat related Illness

Heat waves characterized by long duration and high intensity have the highest impact on morbidity and mortality. The impact of extreme summer heat on human health may be exacerbated by an increase in humidity. There is growing evidence that the effect of heat wave on mortality is greater on days with high levels of ozone and fine particulate matter. Global climate change is projected to further increase the frequency, intensity and duration of heat waves and attributable death (WHO).

Heat related illness is avoidable. It can be best prevented if the vulnerable populations/communities are made aware of prevention tips, basic Do's and Don'ts through effective use of various media. Knowledge of effective prevention and first-aid treatment, besides an awareness of potential side-effects of prescription drugs during hot weather, is crucial for physicians and pharmacists to best mitigate the effects of heat illnesses.

Symptom and First Aid for Various Heat Disorders

Heat Disorder	Symptoms	First Aid
Heat Rash	Skin redness and pain, possible swelling, blisters, fever, headaches.	Take a shower using soap to remove oils that may block pores preventing the body from cooling naturally. If blisters occur, apply dry, sterile dressings and seek medical attention.
Heat Cramps	Painful spasms usually in leg and abdominal muscles or extremities. Heavy sweating.	Move to cool or shaded place. Apply firm pressure on cramping muscles or gently massage to relieve spasm. Give sips of water. If nausea occurs, discontinue.
Heat Exhaustion	Heavy sweating, weakness, skin cold, pale, headache and clammy extremities. Weak pulse, normal temperature, possible fainting, vomiting.	Get victim to lie down in a cool place. Loosen clothing. Apply cool, wet cloth. Fan or move victim to air-conditioned place. Give sips of water slowly and if nausea occurs, discontinue. If vomiting occurs, seek immediate medical attention; call 108 for ambulance.
Heat Stroke (Sun Stroke)	High body temperature. Hot, dry skin. Rapid, strong pulse. Possible unconsciousness or altered mental status. Victim will likely not sweat.	Heat stroke is a severe medical emergency. Call 108 for ambulance for emergency medical services or take the victim to a hospital immediately. Delay can be fatal. Move victim to a cooler environment. Try a cool bath or sponging to reduce body temperature. Use extreme caution. Remove clothing. Use fans and/or air conditioners. DO NOT GIVE FLUIDS ORALLY if the person is not conscious.

4.3. Hospital Preparedness Measures for Managing Heat related Illness

In-charge of Hospitals in District/Blocks should ensure that the following measures are in place:

a) Detailed action plan to tackle heat-related illnesses well in advance of hotter months.
b) Standard Operating Procedures to tackle all levels of heat-related illnesses. Capacity building measures for doctors, nurses and others staff should be undertaken.
c) Cases with suspected heat stroke should be rapidly assessed using Standard Treatment Protocols.
d) Identify surge capacities and mark the beds dedicated to treat heat stroke victims and enhance emergency department preparedness to handle more patients.
e) Rapid Response Teams (RRT) to respond to any exigency call outside the hospitals.
f) Ensure adequate arrangements of Staff, Beds, IV fluids, ORS, essential medicines and equipments to cater to management of volume depletion and electrolyte imbalance.
g) May try to establish outreach clinics at various locations easily accessible to the vulnerable population to reduce the number of cases affected. Health Centres must undertake awareness campaigns for neighborhood communities using different means of information dissemination.
h) Primary Health Centres must refer the patients to the higher facility only after ensuring adequate stabilization and basic definitive care.
i) Hospitals must ensure proper networking with nearby facilities and medical centres to share the patient load which exceeds their surge capacities.
j) All cases of heat-related illnesses should be reported to IDSP (Integrated Disease Surveillance Programme) unit of the district.

4.4. Acclimatization

Those who come from a cooler climate to a hotter climate, especially during the heat wave season, are at risk. They should be advised not to move out in open for a period of one week. This helps the body get acclimatized to heat. They should also be advised to drink plenty of water. Acclimatization is achieved by gradual exposure to the hot environment during a heat wave.

4.5. Heat Illness Treatment Protocol

Recognizing that treatment protocols may vary slightly according to the setting (EMS, health centre, clinic, hospital emergency department, etc.), the following should apply generally to any setting and to all patients with heat related illnesses:

1. Initial patient assessment primary survey (airway, breathing, circulation, disability, exposure), vital signs including temperature.
2. Consider heat illness in differential diagnosis if:
    a) Presented with suggestive symptoms and signs
    b) Patient has one or more of the following risk factors:
        - Extremes of age (infants, elderly)
        - Debilitation/physical deconditioning, overweight or obese
    c) Lack of acclimatization to environmental heat (recent arrival, early in summer season)
    d) Any significant underlying chronic disease, including psychiatric, cardiovascular, neurologic, hematologic, obesity, pulmonary, renal, and respiratory disease
    e) Taking one or more of the following:
        - Sympathomimetic drugs
        - Anticholinergic drugs
        - Barbiturates
        - Diuretics
        - Alcohol
        - Beta blockers
3. Remove from environmental heat exposure and stop physical activity
4. Initiate passive cooling procedures
    a) Cool wet towels or ice packs to axillae, groin, and around neck; if patient is stable, may take a cool shower, but evaluate risk of such activity against gain and availability of other cooling measures
    b) Spray cool water or blot cool water onto the skin
    c) Use fan to blow cool air onto moist skin
5. If temperature lower than 40°C, repeat assessment every 5 minutes; if improving, attempt to orally hydrate (clear liquids, ORS can be used but not necessary; cool liquids better than cold). If temperature is 40°C or above, initiate IV rehydration and immediately transport to emergency department for stabilization.

Livestock Preparedness during Hot Weather

Extreme heat causes significant stress to livestock. There is a need to plan well for reducing the impacts of high temperatures on livestock. Keeping an eye on the weather forecasts, and developing a mitigation plan for high to extreme temperature can be effective in ensuring that the livestock has sufficient shade and water on hot days.

Chapter-5

Roles and Responsibilities and Implementation Plan

5.1 Role of State Government:

Punjab has notified State Disaster Management Authority (SDMA) & State Executive Committee (SEC) at State & DDMAs at all Districts under DM Act, 2005 to take effective steps for disaster management. These authorities are in charge of the relief and rehabilitation measures to look into the said activities. Department of Revenue has established Disaster Management Cell (DMC) to assist SDMA & DDMAs linkages with the various development and regulatory departments concerned with prevention, mitigation and preparedness. DMC also focuses on capacity building, participation and empowerment of these stakeholders in Heat Wave management.

5.2 Role of District Administration:

The DDMA has the responsibility for overall management of disasters in the district. The Chairman-cum-District Commissioner has the authority to mobilise the response machinery and has been given financial powers to draw money under the provisions of the General Financial Rules/Treasury Codes. All departments of the State Government, including the police, fire services, public works, irrigation etc., in accordance with NDMA Guidelines on Heatwave-2019 work in a coordinated manner under the leadership of the Deputy Commissioner during a disaster. DDMA/District administration should also focus on capacity building, participation and empowerment of these stakeholders in disaster management at local level.

5.3 Role of Local Self-Governments:

Local self-governments, both rural and urban, have emerged as important tiers of governance, after the 73rd and 74th Amendments to the Constitution. These units can play an important role in Heat Wave management under the overall leadership of the District Administration.

5.4 Role of Public/NGO/Civil Society/Media:

The local community is both victim and usually the first responder in case of a disaster. Local community also carries traditional knowledge and relevant counter measures regarding disaster management. So the role of local community must be utilized with the help of NGOs and media. Mobilisation of community action supported by local NGOs, along with government machinery is a must for quick, efficient and effective response. For this, healthy coordination must exist between local administration and local community/NGOs. Local NGOs and civil

society must work on developing a deep culture of safety and prevention in society.

NGOs, civil society and media also play an active role as pressure groups in a democracy so that any laxity on part of the government can be traced and fixed. So, the public and the NGOs should keep a close vigil over the functioning of the government regarding disaster management and render their services as a watchdog.

The services of trained volunteers should also be utilized for the management of heat wave in the District.

5.5 Departmental Responsibilities and Implementation Plan for Heat Wave Management

Heat wave mitigation measure involve a multi-sectoral and multi-dimensional administrative approach involving activities such as provision for drinking water, temporary shelter, rescheduling the working hours, providing better emergency medical services/ public health and so on. This action plan provides a framework for implementation, coordination and evaluation of activities undertaken by Departments/Authorities in their respective area to reduce the negative impact of extreme Heat Wave. In view of above, some of the departments have been identified and their responsibilities are fixed for the proper management of Heat Wave in the District:

Sr. No.	Task/Activities	District Agencies & their Responsibilities	
		District	Responsibility
Understanding Risk			
1.	**Preparation of Heat Wave Action Plan in coordination with all stakeholders**	District Admin./DDMA/ ULBs/PRIs	• Preparation/revision of Heat Wave Action Plan based on NDMA REVISED Guidelines and local experiences
Interagency Coordination			
2.	**Establish Early Warning System**	District Admin./DDMA/ ULBs/PRIs	• Real-time surveillance and evaluation of weather situation. • To disseminate the information received from IMD to the public at large. • Disseminate the heat-health warning, determine the threshold for action and communicate the risks. • Prepare SoP for heat wave response based on extended range of forecast and Numerical Weather Prediction.

			• Coordination among all stakeholders with clearly defined roles and responsibilities. • Flexible timing of market and offices. • Take necessary measures, wherever applicable. • Collaboration with non-government and civil society. • Provide occupational support and advisories. • Special care for vulnerable groups- children, disabled, women and old aged.
	Monitoring of Medical Preparedness	District Admin./ DDMA/Health Department	• Develop monitoring mechanism for implementation of heat wave action plan. • Provision of funds for heat action mitigation plans. • Constitution & deployment of rapid medical and response teams.
Investing in DRR-Non-Structural Measures			
3.	**Preparedness Measure**	District Admin./DDMA /ULBs/PRIs	• Appointment of Nodal Officer at each level (district, tehsil and block, department etc.) • Implementation of Heat Wave Action Plan. • Issue necessary direction for preparedness.
		District Admin./Police Department	• Ensure shade for on duty traffic police, as they are more exposed to heat wave and distribution of cool jackets for traffic police personals.
		DDMA/ District Admin./ULBs/ PRIs	• Heat wave should be included in annual disaster event/calendar. • Inter district collaboration for sharing experiences and data. • Reviewing preparedness & mitigation measures.
	Short- and Medium-term Mitigation Measures	District Admin./ Department of Health	• Prepare hospital preparedness plans. • Preparedness of the heat health and social care system. • Ensuring 24X7 heat health facilities with adequate provision of basic medicine like ORS, Glucose, etc. • Dissemination of heat wave health plan by organizing awareness campaigns.

	Short- and Medium-term Mitigation Measures	Dept. of Forest in coordination with other departments	• Identify "heat hot-spots" using framework for tracking based on IMD data. • Maintain water bodies in the forest areas for wild animals & birds. • Afforestation and plantation. • Take necessary measures to prevent forest fire.
		Department of Rural Development and Panchayati Raj	• Implementation of instruction for mainstreaming heat health precautionary measures, including re-scheduling of working hours in all schemes and programmes. • Ensure shed for resting and drinking water facilities for workers at all work places.
		Department of Water Supply and Sanitation	• Ensure drinking water facilities. • Identify vulnerable places and ensure drinking water facilities. • Repair/maintenance of mechanical faults of tube wells, ponds, jorhat, at priority basis to ensure water storage. • Suitable arrangement for drinking water supply and promptly respond to water scarcity. • Ensure drinking water facilities at all common places and nearby habitations.
		Education Higher/ Elementary	• Rescheduling of school timing and vacation as per heat wave situation. • Ensuring cool places for all educational institutions, and availability of water facilities. • Ensure that students avoid outdoor physical activities during the summer in schools. • Research on heat wave related issue through universities/colleges.
		Department of Labour/ Department of Social Welfare	• Implement the directions for heat wave season. • Re-scheduling of working hours for employees in different sectors. • Ensure drinking water facilities at work places. • Coordinate with Health Department and ensure regular health check-up of the workers and provide emergency ice packs and heat illness prevention material to construction workers.

	Short- and Medium-term Mitigation Measures	Department of Animal Husbandry	• Follow the advisory on heat wave. • Shelter for livestock and animal husbandry should be maintained. • Pre-positioning of adequate veterinary medicines and supplies. • Update contingency plan regarding provision of drinking water for animals.
		District Admin./DDMA /ULBs/PRIs	• Open parks/open areas during daytime for providing spaces with shade. • Sprinkling of water on roads. • Construct shelters, sheds at public places, provide access to public parks during heat wave season. • Promote cool roofs initiative such as paint roof white, create green roofs and walls, and plant trees in neighborhood to keep them cool.
		Department of Transport/Punjab Roadways	• To ensure: 1) Shelter/Sheds at bus stops, 2) frequency of transportation, 3) drinking water facilities at bus stops. • Enable better emergency transport system for affected people to health care facilities with adequate essential equipments.
		Punjab State Electricity Board	• Ensure repair & maintenance work for uninterrupted power supply before and during the summer. • Re-scheduling load shedding.
		Divisional Railways Manager, Ferozepur	• Repair/maintenance of mechanical /electrical system on priority basis including fan and cooling system. • Ensure drinking water facilities in trains and railway stations.
		Department of Science & Technology	• To develop application/App related to awareness generation, quick information sharing on the Heat Wave Risk Reduction. • Research & development activities to promote utilization of science & technology in the field of Heat Wave Risk Reduction.

			• Promote research on heat wave related issues.
Investing in DRR-Structural Measures			
4.	**Long term Mitigation Measures**	District Admin./PWD (B&R)/Other Stakeholder Departments	• Long term planning for heat resilience infrastructure. • Promote cool roofs technology and use other similar heat reducing technology. • Ensure implementation of mixed-use planning adopted in heat wave affected cities/towns. • Heat appropriate planning of new buildings (consideration, e.g., in architecture, width/height ratio, street development, orientation and site) in urban and rural areas. • Ensure capacity building of structural engineers, civil engineers and architects for construction of green buildings, maintenance and fire safety of the structures. • Ensure to construction of green buildings, environment and building code related to heat wave risk mitigation.
		District Admin./ PWD (B&R)/ ULBs/PRIs	• Ensure implementations of latest National Building Code (NBC) of India 2016 Part-IV “Fire & Life Safety” in their building by laws.
		District Admin./ Department of Forest	• Ensure construction of green buildings, Energy Conservation Building Code (ECBC) related to heat wave risk mitigation. • Increase forest coverage and green area. • Afforestation and mass plantation. • Coordinate with Transport Department and Road Construction Department for plantation of trees along roadside, barren land and other areas. • Prevention of forest fires and control measures.
		Department of Agriculture/ Horticulture	• Promote short duration and heat resisting crops. • Promote sprinkler irrigation during the evening and early morning.

Capacity Development			
5.	**Capacity Building**	District Admin./ DDMA/Civil Defence/Red Cross Society/ Health and Education	• Develop training module and conduct proper training program for different stakeholders. • Heat wave management should be added in school curriculum to sensitize school children and local people. • Conduct capacity building and training program as per domain and expertise of department.
		District Admin./PWD (B&R)/ULBs/ PRIs/Other Stakeholder Departments	• Capacity building of structural engineers, civil engineers and architects for construction of green buildings, maintenance and fire safety of the structures. • Long term mitigation measures construction of green buildings, environment, and building code related to heat wave risk mitigation.
Awareness			
6.	**Media Campaign and IEC Activity**	District Admin./ DDMA/ Information and Public Relations Dept. and other concerned departments	• IEC Campaign to create awareness through print media, electronic media, social media, etc. • Display board with colour coding for heat wave alert. • Display Do's and Don'ts in the Public Areas, Hospitals, Parks, etc. • Develop of mobile application for faster spread of heat related issues, alertness, space for shelters and drinking water.
Data Collection			
7.	**Data Collection and Documentation**	DDMA/Health Department through Nodal Officer	• Establish a data monitoring cell and collect data from tehsils and maintain district level data base. • A standardized collection of granular data. • Standard protocol for death investigation. • Adopt uniform process for registration of casualties/deaths due to heat wave based on the post mortem report, death count, type of disease, time and duration.

Annexure-I

Heat Wave DO's and DON'Ts

Do's

Must for All

- Listen to Radio; watch TV; read Newspaper and other sources for local weather news/heat advisories.
- Drink sufficient water - even if not thirsty. Persons with epilepsy or heart, kidney or liver disease who are on fluid-restricted diets or have a problem with fluid retention should consult a doctor before increasing liquid intake.
- Use ORS (Oral Rehydration Solution), homemade drinks like lassi, torani (rice water), lemon water, buttermilk, coconut water, etc. to keep yourself hydrated.
- Wear lightweight, light-coloured, loose, cotton clothes.
- If outside, cover your head: Use a cloth, hat or umbrella. Use sunglasses to protect your eyes and sunscreen to protect your skin.
- Get trained in first aid.
- Take special care for the elderly, children, sick or overweight as they are more likely to become victims of excessive heat.

Employers and Workers

- Provide cool drinking water near workplace.
- Caution workers to avoid direct sunlight.
- Schedule strenuous jobs to cooler times of the day.
- Increasing the frequency and length of rest breaks for outdoor activities.
- Pregnant workers and workers with a medical condition should be given additional attention.
- Notify workers about heat wave alerts.

Other Precautions

- Stay indoors as much as possible.
- Traditional remedies like onion salad and raw mango with salt and cumin can prevent heat stroke.
- Use fans, damp clothing and take a bath in cold water frequently.
- Offer water to vendors and delivery people who come to your home or office.
- Use public transport and car-pooling. This will help reduce global warming and heat.

- Don’t burn dry leaves, agriculture residue and garbage.
- Conserve water bodies. Practice rainwater harvesting.
- Use energy-efficient appliances, clean fuel and alternative sources of energy.
- If you feel dizzy or ill, see a doctor immediately or ask somebody to take you to the doctor immediately.

For a Cooler Home

- Use solar reflective white paint, cool roof technology, air-light and cross ventilation and thermo cool insulation for low-cost cooling. You can also keep haystacks or grow vegetation on roofs.
- Install temporary window reflectors such as aluminum foil-covered cardboard to reflect heat back outside.
- Keep your home cool, use dark colour curtains, tinted glass/ shutters or sunshade and open windows at night. Try to remain on the lower floors.
- Green roofs, green walls and indoor plants reduce heat by cooling the building naturally, reducing air-conditioning requirements and release of waste heat.
- Maintain AC temperature at 24 degrees or higher. This will reduce your electricity bill and make your health better.

While constructing a New Home

- Use cavity wall technology instead of regular walls.
- Construct thick walls. They keep the interiors cool.
- Construct lattice walls and louvered openings. They allow maximum air flow while blocking the heat.
- Use natural materials like lime or mud to coat walls.
- Avoid glass, if possible.
- Consult a Building Technology expert before construction.

Treatment of a person affected by Sun Stroke

- Use a wet cloth / pour water on the victim’s head.
- Give the person ORS to drink or lemon sarbat / torani or whatever is useful to rehydrate the body.
- Take the person immediately to the nearest health centre.
- If consistently experiencing high body temperature, throbbing headache, dizziness, weakness, nausea or disorientation in the summer, call an

ambulance.

Don’ts

- Avoid going out in the sun, especially between 12.00 Noon and 03.00 PM.
- Avoid strenuous activities when outside in the afternoon.
- Do not go out barefoot.
- Avoid cooking during peak hours. Open doors and windows to ventilate cooking area adequately.
- Avoid alcohol, tea, coffee and carbonated soft drinks, which dehydrates the body.
- Avoid high-protein food and do not eat stale food.
- Do not leave children, pets or anybody in parked vehicles - as they may get affected by Heat.
- Don’t drink ice-cold drinks as they can cause stomach cramping.

Dos for Heat Wave in Agriculture

Do’s

- Apply light and frequent irrigation to the standing crops.
- Increase the frequency of irrigation at critical growth stages.
- Mulch with crop residue, straw, polythene or undertake soil mulching to conserve soil moisture.
- Irrigate only during the evening or early morning.
- Use sprinkler irrigation.
- If your area is prone to heat wave – adopt wind / shelters breaks.

Animal Husbandry

Do’s

- Keep animals in shade and give them plenty of clean and cold water to drink.
- Do not make them work between 11:00 AM to 04:00 PM.
- Cover the shed roof with straw, paint it white or plaster with dung-mud to reduce temperature.
- Use fans, water spray and foggers in the shed.
- During extreme heat, spray water and take cattle to a water body to cool

off.

- Give them green grass, protein-fat bypass supplement, mineral mixture and salt. Make them graze during cooler hours.
- Provide curtains and proper ventilation in poultry house.

Don’ts

- Avoid grazing / feeding of cattle during noon hours.

HEAT WAVE : Protect yourself with simple precautions

Heat stroke can be dangerous. To minimize its effects, take the following safety measures to prevent serious ailments and exhaustion:

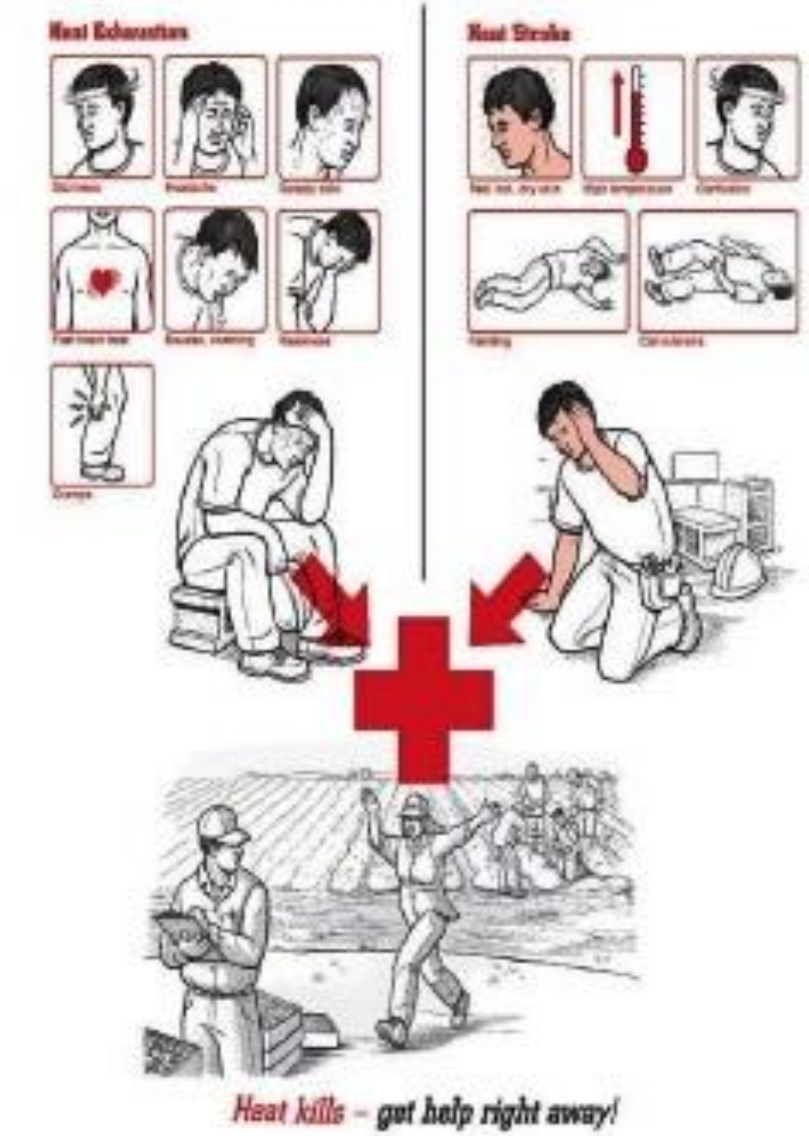
Safety Tips:

- As far as possible, avoid going out in the hot sun, especially during peak hours.
- Drink sufficient water at frequent intervals, even if not thirsty. Always carry drinking water while travelling.
- While going out in sun, wear light colored and loose clothes; use protective goggles; cover your head with a cap or towel and always wear shoes or chappals.
- Avoid strenuous activities in scorching sun, when the outside temperature is high.
- If you have to work outside, use damp cloth or an umbrella to cover your head.
- Eat light meals and fruits rich in water content like melons, cucumber and citrus fruits. Avoid foods that are high in protein, such as meat and nuts, which increase metabolic heat.
- Use home-made beverages like lemon water, butter milk and juices, etc.
- Never leave children and pets alone in parked vehicles.
- Keep animals in shade and give them sufficient water to drink.
- Keep your home cool, use curtains, shutters or sunshade etc. Open windows at night to maintain adequate ventilation.
- Listen to local weather forecasts and be aware of impending temperature changes.
- In case of illness and fainting, consult a doctor/seek immediate medical help.

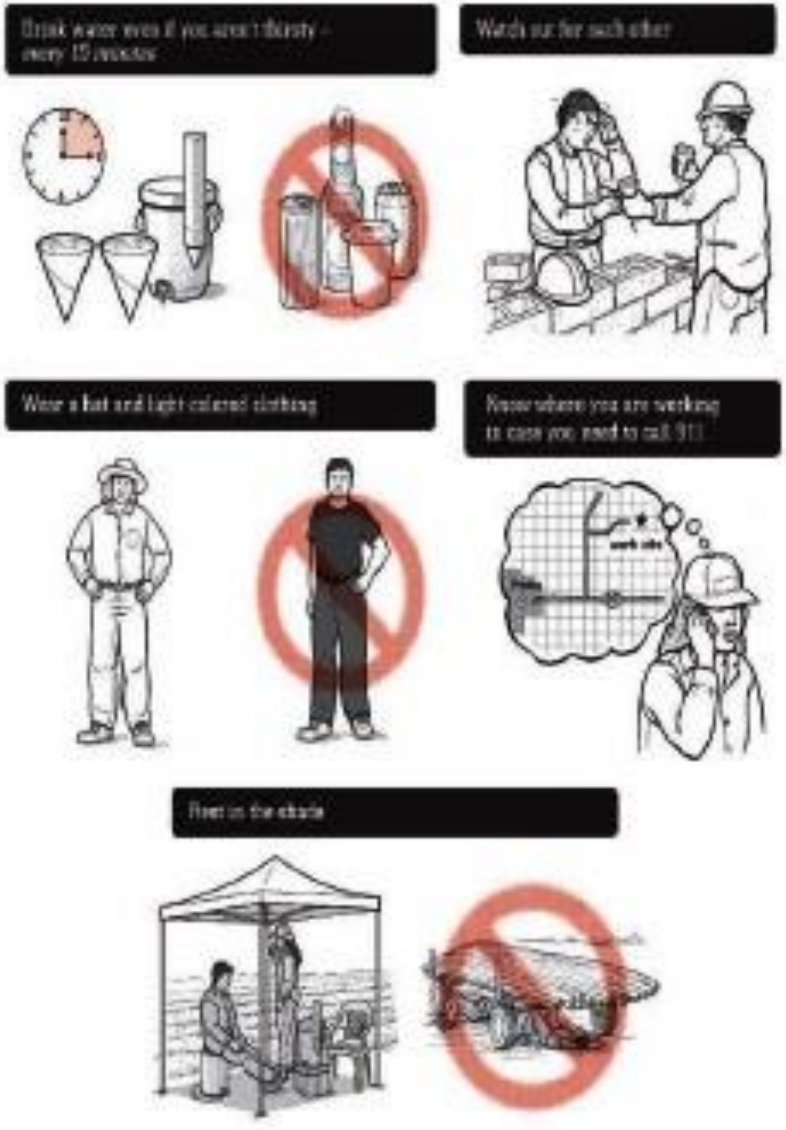
What to do in Heat Stroke:

- Get the person indoors or into a cool/shady area, make him/her lie down with feet slightly elevated.
- Wipe the body with a wet cloth or spray cold water to the skin.
- Give the person ORS/lemon water/salt-sugar solution or juice to re-hydrate the body.
- Do not give anything to eat or drink to a person until he/she is fully conscious.
- Take the person to the nearest health centre if symptoms do not improve in one hour.

Two types of heat illness:



Stay safe and healthy!



Health effects of heat

Two types of heat illness:

Heat Exhaustion

Heat Stroke

Watch out for early symptoms. You may need medical help.
People react differently — you may have just a few of these symptoms, or most of them.

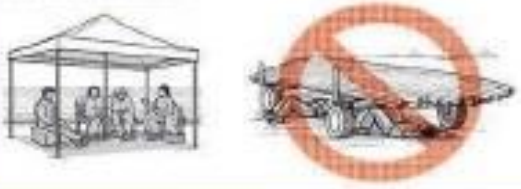
1

Stay safe and healthy!

WATER. REST. SHADE. The work can't get done without them.

Drink water even if you aren't thirsty — every 15 minutes.

Rest in the shade.



Watch out for each other.

Wear hats and light-colored clothing.

'Easy does it' on your first days of work in the heat. You need to get used to it.
Rest in the shade – at least 5 minutes as needed to cool down.

2

Format A: Deaths Reported due to Heat Wave (District Report to SDMA)

Name of the District: **Year:** **Reporting Period:** **Date of Report:**

Sub-division		Location						Occupation					Economic		
		Urban		Rural		Total		Famers	Labours	Hawkers	Other	Total	BPL	APL	Total
Sub-division-1	Age Group	M	F	M	F	M	F								
	0-6 year														
	7-18														
	19-35 Years														
	36-60														
	61>above														
	Sub Total														
Sub-division-2	0-6 year														
	7-18														
	19-35 Years														
	36-60														
	61>above														
	Sub Total														
Grand Total of the District															

Name and Designation of the Reporting Officer: Signature with Date

Format B: Details of the Deaths Reported due to Heat-Wave (Record kept with District)

Sr. No.	Name and Address	Sex (M/F) & Age	Occupation	Place of Death	Max Temp. Recorded (Rectal & Oral)	Deaths reported during heat period or not	List of chronic disease present (ask the family member)	Date & Time of Autopsy (If Conducted)	Date & Time of Joint enquiry conducted with a Revenue Authority	Cause of Death	Remarks	
											Related to Autopsy	Related to Joint Enquiry
	1	2	3	4	5	6	7	8	9	10	11	12
1.												
2.												
3.												
4.												
5.												
6.												

Name and Designation of the Reporting Officer: Signature with Date:

Format C: Daily Report of Heat Stroke Cases and Deaths (District Report to State)

S. No	Village	PHC	Block/Town /City	Name & Son/D/Wife of	Urban-U Rural-R	BPL Y/N	Age/Sex	Date of Attack of Heat Stroke	Any Antecedent Illness	Cause of death	Death confirmed by MO & MROs
	1	2	3	4	5	6	7	8	9	10	11
1.											
2.											
3.											
4.											
5.											

List of Important Contact Numbers with Name and Designation

Sr. No.	Designation of the Officer	Name of the Officer	Telephone Number		
	Administrative Officers	S./Sh./Smt.	Office No.	Residence No.	Mobile No.
		1	2	3	4
1.	Commissioner Ferozepur, Div. Ferozepur	Sh. Arun Sekhri, I.A.S.	01632-244004 Fax: 245467	01632-244005	98722-21702
2.	Deputy Commissioner, Ferozepur	Sh. Rajesh Dhiman, I.A.S.	01632-244008	01632-244006	98156-03737
3.	SSP, Ferozepur	Smt. Saumya Mishra, I.P.S.	01632-246697 01632-244049	01632-244023	79784-74763
4.	ADC (G) Ferozepur	Dr. Nidhi Kumud Bambah	01632-244073	01632-244069	82838-16950
5.	ADC (D) Ferozepur	Sh. Arun Sharma	01632-244074	01632-248361	98145-10900
6.	DDPO Ferozepur	Sh. Jaswant Singh	01632-244460	-	99884-35333
7.	SDM Ferozepur	Smt. Charumita Shekher	01632-244295	-	84279-90701
8.	SDM Ghuruharsahai	Sh. Gagandeep Singh	01685-231050	-	96508-78192
9.	SDM Zira	Sh. Gurmit Singh	01682-250117	-	98729-48650
10.	Distt. Revenue Officer, FZR	Major Gurjinder Singh Benipal	01632-244024	-	88728-47036
11.	Tehsildar Zira	Sh. Mangu Bansal (Add. Charge)	01682-250169	-	89688-55688
12.	Tehsildar Ferozepur	Sh. Rajinder Singh	01632-244019	-	79865-53512
13.	Tehsildar Guruharsahai	Sh. Rajinder Singh	01685-231010	-	79865-53512

Sr. No.	Designation of the Officer	Name of the Officer	Telephone Number		
	Administrative Officers	S./Sh./Smt.	Office No.	Residence No.	Mobile No.
		1	2	3	4
14.	Civil Surgeon Ferozepur	Dr. Rajwinder Kaur	01632-245173	01632-244028	96460-48267
15.	DRM Ferozepur	Sh. Sanjay Sahu	01632-244386	01632-244082	97792-32000
16.	GM, Punjab Roadways	Sh. Paramjit Singh	01632-224144 01632-220531	-	94176-91767
17.	Dy. Director Food & Supplies Ferozepur	Sh. Rajrishi Mehra	01632-245316	01632-245316	81465-36161
18.	Dy. Director Animal Husbandry, FZR	Sh. Himanshu Syal	01632-246089	-	98772-36765
19.	GM, Telecom	Sh. Kawal Deep Singh	01632-245290	-	94173-00015
20.	R.T.A. Ferozepur	Dr. Nidhi Kumud Bambah	-	-	82838-16950
21.	DPRO Ferozepur	Sh. Amrik Singh	01632-244065	-	98151-00140
22.	Distt. Education Officer (S) Ferozepur	Sh. Sanjiv Gautam	01632-245149	-	98723-82240
23.	Distt. Education Officer (E) Ferozepur	Smt. Neelam Rani	-	-	84274-00941
24.	Secy. Red Cross, Ferozepur	Sh. Ashok Kumar Behal	01632-244247	-	92174-00009
25.	Naib Tehsildar, Zira	Sh. Mangu Bansal	01682-250169	-	89688-55688
26.	Naib Tehsildar, Ferozepur	Sh. Jagtar Singh	01632-244019	-	98150-97597

Sr. No.	Designation of the Officer	Name of the Officer	Telephone Number		
	Administrative Officers	S./Sh./Smt.	Office No.	Residence No.	Mobile No.
		1	2	3	4
27.	Naib Tehsildar, Makhu	Sh. Parampal Singh	01682-250169	-	95018-80008
28.	Naib Tehsildar, Guruharsahai	Sh. Jai Amandeep Singh	01685-230010	-	98786-00239
29.	Naib Tehsildar, Mamdot	Sh. Anoop Singh	01632-262119	-	94172-71598
30.	Naib Tehsildar, Talwandi Bhai	Sh. Gurdeep Singh	-	-	95016-96200
31.	Naib Tehsildar, Mallanwala	Sh. Charanpreet Singh	-	-	95175-06006
32.	BDPO Ferozepur	Sh. Harkeet Singh	01632- 220004	-	94177-81063
33.	BDPO Ghall Khurd	Smt. Amandeep Kaur	01632-256043	-	93910-00008
34.	BDPO Guruharsahi	Sh. Prabhjeet Singh	01685-230049	-	80087-58096
35.	BDPO Zira	Sh. Surjit Singh	01682-250525	-	98153-98329
36.	BDPO Makhu	Sh. Satnam Singh (Supdt.)	01682-270587	-	98725-28635
37.	BDPO Mamdot	Sh. Sukhdeep Singh	01632-262247	-	94176-49946
38.	EO MC, Ferozepur	Sh. Happy Kumar	01632-246293	-	96463-50088
39.	CEO Cantt. Board, Ferozepur	Sh. Abhishek Tripathi	01632-244333	01632-244391	81788-69066
40.	EO MC, Guruharsahai	Sh. Gurdas Singh	01685-230101	-	98888-65240
41.	EO MC, Zira	Sh. Dharampal Singh	01682-250769	-	85588-86100
42.	EO MC, Talwandi Bhai	Smt. Poonam Bhatnagar	01632-230101	-	97803-16600

Sr. No.	Designation of the Officer	Name of the Officer	Telephone Number		
	Administrative Officers	S./Sh./Smt.	Office No.	Residence No.	Mobile No.
		1	2	3	4
43.	EO NP, Makhu	Sh. Dharampal Singh	01682-270356	-	85588-86100
44.	EO NP, Mudki	Smt. Poonam Bhatnagar	-	-	97803-16600
45.	EO NP, Mallanwala Khas	Sh. Dharampal Singh	01682-275356	-	85588-86100
46.	EO NP, Mamdot	Smt. Poonam Bhatnagar	-	-	97803-16600
47.	DMO Ferozepur	Sh. Maninderjit Bedi	01632-220130	-	99157-00949
48.	DM Markfed, Ferozepur	Sh. Kamaldeep	01632-227884 01632-226012	-	98760-93347
49.	DFO, Ferozepur	Sh. Satindar Singh	01632-220698	-	98556-68500
50.	Chief Agriculture Officer, Ferozepur	Sh. Jagir Singh	-	-	98552-26781
51.	Deputy Director Horticulture, Ferozepur	Dr. Balkar Singh	-	-	75080-18825
52.	Police Control Room, Ferozepur		01632- 244100, 249261, 242380	-	

Deputy Commissioner-cum-
Chairman, DDMA Ferozepur,
District Ferozepur, Punjab