BRIEFING PAPER

Naturland ACADEMY

THE IMPACT OF CLIMATE CHANGE AND HEAT ON THE WORLD OF WORK

Climate change has multidimensional effects on employment and the world of work. Extreme weather events and environmental hazards, such as excessive heat, pose risks to human health when working outdoors in sectors such as agriculture. The greatest temperature increases are expected in the coolest subregions, such as North America and Eastern Europe, while the hottest subregions will also experience rising temperatures, significantly exacerbating heat-related risks in the workplace. Consequently, this affects people's well-being and reduces productivity. This briefing paper focuses on the impact of heat induced by climate change on working conditions in agriculture and discusses solutions for protection and prevention.

Heat stress and its effects on health

Since agricultural work mainly takes place outdoors and involves physical labor, workers in this sector are also more susceptible to health risks caused by high temperatures resulting from climate change. The phenomenon of "heat stress" occurs when the body absorbs more heat than it can tolerate without experiencing physical discomfort. If body temperature exceeds 38°C, physical and cognitive functions are affected. At a body temperature above 40.6°C, severe organ damage, unconsciousness, and even death can occur. Heat-related symptoms such as fatigue, dizziness, and muscle cramps may arise, as may illnesses such as heat stroke, electrolyte imbalances, cardiovascular disease, and respiratory impairments. Kidney damage and chronic kidney disease caused by dehydration and heavy workloads have also been observed in people working in hot and tropical climates.

Heat stress exposure in numbers

An estimated 2.4 billion people were exposed during their work in 2020. Additionally, 22.85 million non-fatal-work-related accidents and 18,970 deaths have been linked to extreme heat, 6.1% of which were avoidable had workers not been exposed to extreme climatic conditions.

Risk factors when working in heat

- **Dehydration:** Fluid intake is essential, as the body loses a lot of fluid through sweating. This fluid loss can be exacerbated by consuming sugary and caffeinated drinks.
- **Pressure through piecework wages:** There is a risk that workers may push themselves beyond their physical limits and ignore warning signs from their bodies, such as dehydration, in order to earn more money – often because they cannot survive on their wages alone. For example, they may not take breaks to drink.

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Naturland - Verband für ökologischen Landbau e.V.
Association for Organic Agriculture
www.naturland.org

academy@naturland.org
www.academy.naturland.org

- **Inadequate work equipment and environment:** UV radiation poses severe risks to the eyes and skin.
- **Gender-specific risks:** There is scientific evidence that women reach a body temperature of 38°C more quickly, making them more vulnerable. This can be exacerbated by the fact that they may still have poor access to sanitary facilities.
- **Cultural and organizational barriers:** Power imbalances between workers and supervisors may mean that workers do not feel confident about using drinking water sources, bathrooms, or taking breaks. Language barriers may also be a factor preventing workers from understanding health and safety information (even if available) and thus hindering their access to preventive measures and treatment.

Figure 1: *Workers in sugarcane field, Manduvira, Paraguay. © Naturland*

Best Practice: Protecting workers can increase productivity in agriculture
Sugarcane Processor Ingenio San Antonio, Nicaragua & La Isla Network

An epidemic of chronic kidney disease has been observed among workers employed at sugarcane plantations in Central America. While the exact cause is not yet fully understood, it is widely hypothesized that kidney damage is associated with the physically demanding working conditions and exposure to extreme heat. Work in the sugarcane fields typically involves long working hours of strenuous physical activity in direct sunlight. Workers are often paid by piece, which prevents them from taking adequate breaks and drinking enough water. La Isla Network started its work in response to this chronic kidney disease epidemic among sugarcane workers in Nicaragua.

Today, it is a global network of researchers and advisors for heat stress prevention in workplaces. They have developed the data-driven **"assess-address-assist"** model to not only reduce harm and protect workers' health but also to increase company productivity. After first assessing organizational health and safety policies, weaknesses are addressed using tools to protect workers exposed to heat, with the assistance of La Isla Network. A major part of the solution involves **preventing** heat stress through **rest (scheduled breaks), shade (portable shade tents), hydration (clean water) and sanitation (access to safe sanitation, particularly for women)**.

The model was tested with Ingenio San Antonio, a Nicaraguan sugarcane company, and resulted in a significant reduction in kidney disease among the workforce, from 21% to 1%. At the same time, the workers' productivity and the company's return on investment increased. This model can be transferred to other companies and sectors.

Protection from and prevention of heat stress – recommendations for action

1. **Ensure access to drinking water at all times** with encouragement and reminders to drink frequently adapted to heat and dehydration levels, avoid sugar-based drinks.
2. **Create cooler workplaces** through air-conditioning or fans, using alternative building materials, and using and planting shade trees.
3. **Introduce mandatory regular breaks** that are long enough to allow for cooling down, resting and drinking water in cool, shaded, and ventilated rest areas.
4. **Use adequate clothing and personal protective equipment (PPE)** that should cover and protect the skin from UV radiation, including the neck and head. Light-colored, loose-fitting clothing should be worn, and the eyes should also be protected.
5. **Provide access to clean and safe sanitation facilities**, especially for women, so that workers do not drink too little in order to avoid going to the toilet, and so they can splash water on themselves.
6. **Offer training in heat stress** prevention that is available and understood by all workers.
7. **Implement job rotation to decrease exposure.**
8. **Promote acclimatization to heat exposure** to reduce cardiovascular strain and lower the risk of hyperthermia.
9. **Conduct participatory risk assessment** in the working environment to increase acceptance and compliance among the workforce.
10. **Ensure a respectful, safe working environment** where everyone feels safe to communicate individual needs (e.g., express discomfort), drink sufficient water, and take sufficient breaks.
11. **Provide regular medical check-ups and health monitoring.**

Naturland Social Responsibility Standard: Protection from heat

The Naturland Social Responsibility Standard covers occupational health and safety, obliging all members and partners to ensure safe working conditions for their employees. During annual on-site visits, it is verified whether drinking water is available free of charge and accessible to all workers, if there are shaded break areas, and whether sanitary facilities are accessible to all workers. Moreover, the provision of appropriate work clothing free of charge that protects against weather conditions is also checked. Naturland does not distinguish between seasonal workers, day laborers, or permanent employees. All workers, especially vulnerable groups, must be protected by the companies.

Since 2026, annual inspections explicitly address the issue of heat: Heat stress at work must be taken into account in the companies' occupational health and safety regulations. Workers must be informed about the heat-related risks if they are exposed to such weather conditions.

Figure 2: *Worker refreshes his face with water, Puducherry, India.*
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Sources

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Pictures

Figure 1: © Michael Wolfsteiner

Figure 2: © Ayrus Hill https://unsplash.com/de/fotos/junge-im-orangefarbenen-t-shirt-halt-wasser-HEllO49DBSU

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