



Rivers of the World Foundation, Inc.

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A view of Kedarnath from a helicopter, after it was damaged by floods. (PTI)

We are deeply concerned about the people of Uttarkhand, India and others downstream, who have been badly impacted by the recent disaster near Kedarnath-Badrinath area.

We have heard from people/volunteers in the area that the river water is getting contaminated with corpse and other pollutants being carried by the floodwater. To that end we are providing some guidance and water advisory here which should provide some help towards providing safe and drinkable water. Please follow guidance from local authorities if available.

Attached are some guidance in the following pages from the US Center for Disease Control on boiling and adding bleaching agents (Chlorine or iodine in small quantities) to make the water safe and drinkable. We have gone through some of our in-house literature on water and scores of documents in EPA, CDC and other publications and selectively extracted some relevant information to create the document below. We think it should be helpful for people and communities.

If you can translate them in Hindi as well and distribute that, it may be more effective for the local people.

Adding some bleach helps make water safe to use.

Guidance from the U.S. Center for Disease Control

If tap water is clear:

1. Use bleach that does not have an added scent (like lemon).
2. Add 1/8 teaspoon (8 drops or about 0.75 milliliters) of household liquid bleach to 1 gallon (16 cups) of water.
3. Mix well and wait 30 minutes or more before drinking.

If tap water is cloudy:

1. Use bleach that does not have an added scent (like lemon).
2. Add 1/4 teaspoon (16 drops or 1.5 milliliters) of household liquid bleach to 1 gallon (16 cups) of water.
3. Mix well and wait 30 minutes or more before drinking.

Remember that containers may need to be sanitized before using them to store safe water:

1. Use bleach that does not have an added scent (like lemon).
2. Add 1 teaspoon (64 drops or 5 milliliters) of household liquid bleach to 1 quart (32oz, 4 cups, or about 1 liter) of water.
3. Pour this into a clean storage container and shake well, making sure that the solution coats the entire inside of the container.
4. Let sit at least 30 seconds, and then pour out solution.
5. Let air dry OR rinse with clean water that has already been made safe, if available.

- **Never mix bleach with ammonia or other cleaners.**
 - **Open windows and doors to get fresh air when you use bleach.**
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Water often can be made safe to drink by boiling, adding disinfectants, or filtering.

IMPORTANT: Water contaminated with fuel or toxic chemicals will not be made safe by boiling or disinfection. Use a different source of water if you know or suspect that water might be contaminated with fuel or toxic chemicals.

Boiling

If you don't have safe bottled water, you should boil water to make it safe. Boiling is the surest method to make water safer to drink by killing disease-causing organisms, including viruses, bacteria, and parasites.

You can improve the flat taste of boiled water by pouring it from one container to another and then allowing it to stand for a few hours, OR by adding a pinch of salt for each quart or liter of boiled water.

If the water is cloudy,

- Filter it through a clean cloth, paper towel, or coffee filter OR allow it to settle.
- Draw off the clear water.
- Bring the clear water to a rolling boil for one minute (at elevations above 6,500 feet, boil for three minutes).
- Let the boiled water cool.
- Store the boiled water in [clean sanitized containers](#) with tight covers.

If the water is clear,

- Bring the clear water to a rolling boil for one minute (at elevations above 6,500 feet, boil for three minutes).
- Let the boiled water cool.
- Store the boiled water in [clean sanitized containers](#) with tight covers.

If you don't have safe bottled water and if boiling is not possible, you often can make water safer to drink by using a disinfectant such as unscented household chlorine bleach or iodine. These can kill most harmful organisms, such as viruses and bacteria, but are not as effective in controlling more resistant organisms such as the parasites [Cryptosporidium](#) and [Giardia](#).

To disinfect water,

- Filter it through a clean cloth, paper towel, or coffee filter OR allow it to settle.
- Draw off the clear water.
- To use bleach, add 1/8 teaspoon (or 8 drops; about 0.625 milliliters) of unscented liquid household chlorine (5-6%) bleach for each gallon of clear water (*or 2 drops of bleach for each liter or each quart of water*),
 - ◊ Stir the mixture well.
 - ◊ Let it stand for 30 minutes or longer before you use it.
 - ◊ Store the disinfected water in [clean sanitized containers](#) with tight covers.
- To use iodine, follow the manufacturer's instructions.

Chlorine dioxide tablets are another disinfectant that now is available in some outdoor stores. This disinfectant has proven to be effective against pathogens, including [Cryptosporidium](#), if the manufacturer's instructions are followed.

Filters

Many portable water filters can remove disease-causing parasites such as [Cryptosporidium](#) and [Giardia](#) from drinking water. If you are choosing a portable water filter, try to pick one that has a filter pore size small enough to remove both bacteria and parasites. Most portable water filters do not remove viruses.

Carefully read and follow the manufacturer's instructions for the water filter you intent to use. After filtering, add a disinfectant such as iodine, chlorine, or chlorine dioxide to the filtered water to kill any viruses and remaining bacteria. For more information about water filters, see the [Water Treatment Resources](#) section.

Brushing teeth

Guidance from the U.S. Center for Disease Control (CDC)

Brush teeth with boiled or bottled water. Do not use untreated tap water.

Washing dishes

Household dishwashers generally are safe to use if the water reaches a final rinse temperature of at least 150 degrees or if the dishwasher has a sanitizing cycle.

To wash dishes by hand:

- Wash and rinse the dishes as you normally would using hot water.
- In a separate basin, add 1 teaspoon of unscented household liquid bleach for each gallon of warm water.
- Soak the rinsed dishes in the water for at least one minute.
- Let the dishes air dry completely.

Laundry

It is safe to do laundry as usual.

Pets

Pets can get some of the same diseases as people. It is a good idea to give them boiled water that has been cooled.