During the 1990s events in the Balkans, the ex-Soviet republics, Afghanistan and Northern Iraq have demonstrated that human disasters are not limited to tropical regions of the world. In cold or mountainous regions, relief workers are faced with particular technical challenges, such as the prevention of damage to pipes and equipment caused by freezing

Locally made water storage tanks

- Tank designs should take into account

  the likelihood of ater free ing o er; and
  the amount of damage that this causes.

- Heat lost to the air increases the likelihood of stored ater free ing o er. The surface area to olume ratio of the tank ill affect the rate of heat loss. So:

  a large tank ill take longer to free e o er than a small one;

  a round tank ill lose heat more slo l than a rectangular one of the same olume; and

  straight sides are better than corrugated sides as the ha e a smaller surface area.

- If possible, some form of insulation should be used, e.g. spra -on pol urethane foam.

- Val es can be protected b being co ered and insulated here possible.

- Heat loss to the ground can cause structural instabilit if the fro en ground starts to tha . Mounting the tank on an insulating concrete, or gra el, base ill reduce heat transfer.

- Tank roofs should be designed to cope ith e tra loads arising from sno falls. Steep-angle roofs, for e ample, allo the sno to slide off.

- Designs should take account of rising and falling surface ice ithin a tank, hich can cause damage to internal fittings (e.g. ladders). Internal fittings should be a oided if at all possible.

Figure 1. Temporary water storage tank, showing useful features for cold regions

Water treatment

Lo temperatures affect the rates of

Prepared b Mark Buttle, Michael Smith and Rod Sha