
Photo: M. Karlsson

Adaptation to multiple stressors and cumulative effects (1)

Herders adapt to locked pastures for example by moving their reindeer to lower altitudes (in Sweden) or to coastal lowlands (in northern Norway).

Supplementary feeding is an adaptation strategy used in cases of pasture encroachment and pressure from large carnivores. However, this alters animal behavior and land-use and increases the likelihood of infections.

To avoid disease transmission, the animals should not be kept too close together and a variety of pastures should be used.

Adaptation to multiple stressors and cumulative effects (2)

Climate change affects the spreading of CSI to new geographical areas and increases the transmission risk to reindeer. Ticks are moving northwards along the coasts. At the same time grazing sheep reduce the shrubbery and thus, the spreading of ticks.

A traditional adaptation strategy that is still in use is to move the animals to higher ground to alleviate insect infestations. This may prove useful against ticks as well.

Pastoralists easily adapt to individual stressors. But when looked at in combination, these multiple stressors become a complex challenge. Currently, CSI are a wild card in this web of interactions. However, when the flexibility in using a variety of pastures is further reduced, CSI may become a more prominent stressor in this web.


Photo: M. Karlsson

Adaptation to multiple stressors and cumulative effects (3)

Keeping sheep or reindeer in confined spaces puts the animals under stress and increases their susceptibility to infection. There is a strong connection between outfield grazing and animal health and welfare.

To safeguard animal health and to keep future risks of expanding CSI low, it is critical to protect pastures from encroachment and to prevent further fragmentation of grazing land.

Traditional knowledge has been an important element of adaptation. Today, CSI are no major problem for pastoralists in the North. But CSI pose a risk that pastoralists may have to address in the very near future.

A holistic approach to understanding adaptation is necessary, but not straightforward. Yet, without such an approach, we might miss many critical linkages and causalities.