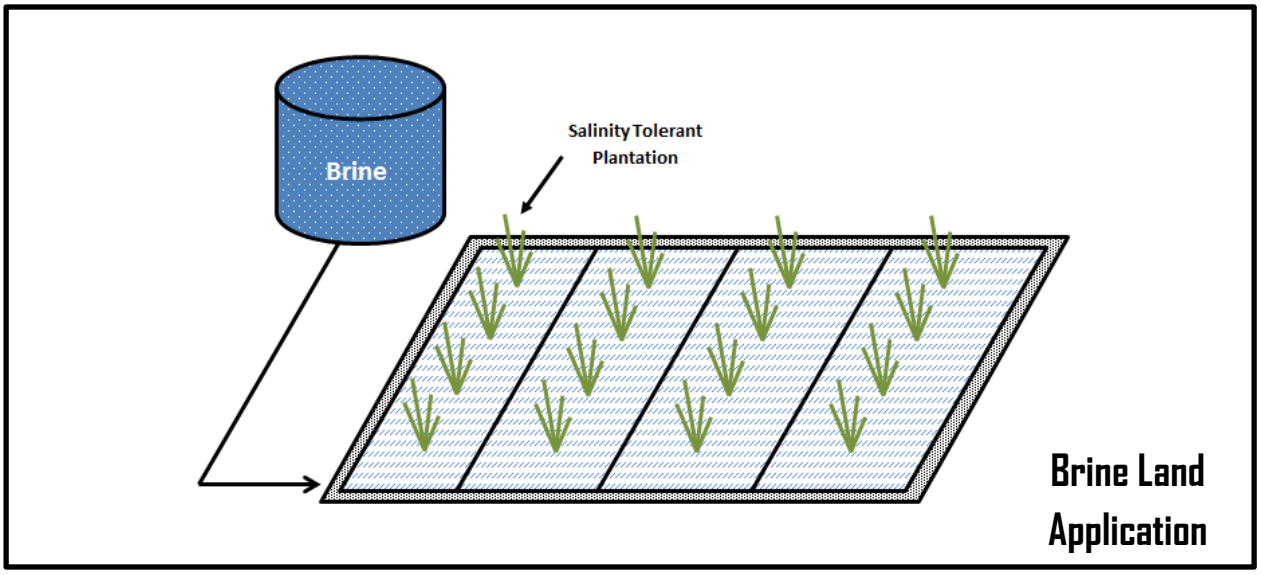

Brine is used for irrigation of salt-tolerant crops and grasses

1. Potential Environmental Impacts

1.1 Irrigation

1.2 Rapid Infiltration

2. Criteria and Methods for Feasibility Assessment

Advantages (+)	Disadvantages (-)
Easy implementation and operation	High footprint and costs
Inland and coastal use	Limited to small plants

Disposing brine with the land application method is usually applied for small size desalination plants and its application is constricted by climate, seasonal application and the existence of available land and groundwater conditions. The method has two available pathways,

1) spray irrigation of brine on salt-tolerant plants
2) infiltration of bine through earthen rapid infiltration basins (RIBs)

1. Potential Environmental Impacts

1.1 Irrigation

Brine irrigation may affect negatively the underlying groundwater aquifer and due to the fact that shallow groundwater aquifers which are usually of lower salinity. Exceptions are shallow saline coastal aquifers or deep confined aquifers isolated from direct or indirect interaction with the concentrate.

1.2 Rapid Infiltration

Disposal of brine with infiltration will usually have problems getting a permit if the concentrate contains arsenic, nitrates, or other contaminants regulated in drinking water. An option, if allowed, is to dilute it to meet the desired standards. Monitoring wells are employed to assess the RIB systems impact on groundwater aquifers.

2. Criteria and Methods for Feasibility Assessment

The main feasibility factors for the use of land application for concentrate disposal are,

1) climate
2) availability and cost of land
3) percolation rate
4) irrigation needs
5) water-quality of the underlying groundwater aquifers
6) salinity tolerance of the irrigated vegetation
7) the ability of the land application system operation to comply with pertinent regulatory requirements and groundwater quality standards

For successfully using the method there must be an available low cost site near the desalination plant with relatively low ground water level and a warm, dry climate. In cold climate conditions and for specific vegetation, we may need to use storage tanks may during the period when the brine cannot be applied (usually 2 to 6 months) or have a backup disposal option.

As the brine salinity increases, it's becoming more difficult to use land application for brine disposal so in many cases the brine has to be diluted in order to meet the quality constraints and/or vegetation salinity tolerance limits. Typically we use wastewater effluent or low-salinity water extracted from shallow aquifers.

Soil type is also of high importance with loamy and sandy soils being usually suitable. Neutral and alkaline soils are preferable because they minimize trace metal leaching. Sites with a groundwater level lower than 2m are preferred. If site groundwater level is less than 3m from the surface, then a drainage system is needed. Typically slopes of up to 20% are suitable for land application.