**Salinization**

Salinization (or the ***accumulation*** of salts in soil) is one of today’s worst environmental disasters and yet does not share the ***global spotlight*** with other ecological issues.

Considering the threat that salinization ***poses*** *to* nearly all irrigated dry-lands and the consequential impact on traditional agriculture, such lagging public awareness is, at the very least, ***disconcerting***. Reports indicate that from 2.5 to 6 million hectares of land are affected by salinization and, unless ***precautionary*** and remedial measures are implemented, economic and environmental ***repercussions*** will be inevitable.

Contributing ecological factors such as soil-type, climate, rainfall and ***topography*** make some lands more vulnerable to the salinization process. However, the vast majority of land degraded though salinization can be directly linked to the human activities, whether it be destroying natural vegetation and bush-lands to clear lads for farms, over-irrigation of cultivated land and/or poor farming practices. Countries like Australia are starting to see the **devastation** of increasing **salinity levels** after a relatively short period of the introduced European farming methods.

Salts such as sodium chloride (*NaCl*) and calcium sulphates (*CaSO4*) occur naturally in many soils and **waterways.** When the concentration of salt levels (salinity) in soil becomes too high, plant growth is adversely affected and the soil structure can be damaged.

Nature dealt reasonably successfully with salinity levels in Australia prior to European settlement. Natural vegetation, including **perennial grasses** and deep-rooted trees, ensures that salts were dissolved as rainwater slowly **filtered down** through the soil.

Salts was moved downward and remained in the plants’ root zone. The **fibrous** root structure of those native plants acted as an effective filter with their high water-holding capacity. Some rainwater was held by roots and some **leached** downwards through soil carrying the dissolved salts. Groundwater **transpired** back into air through foliage of native plants finally.

As Europeans introduced traditional forms of agriculture and cleared large areas of land

for **grazing** in the 1800s, much of the native vegetation in Australia was replaced by the

generally shallow-rooted annual crops and pastures, **substantially** changing the natural

process which had been working well. These crops and pastures use less water than

the original native vegetation and roots do not have the same water-holding capacity.

With the introduction of those crops, then more rainwater and irrigated water makes its

way downwards through soil to below the root-zone. The water, however, still carries

the dissolved salts downwards past of the root-zone but the amount and level of

groundwater is grown. In addition, since the roots of these crops do not hold as much

water, the water is drawn back up from the groundwater later, as the plant needs

moisture.

We see then that the amount and level of groundwater increases because of an

increase in the amount of water being put into the soil and not being in fibrous root

structure like that of native vegetation. This causes water table to rise brining dissolved

salts and leaving the high salt concentrations behind, which is the salinization process.

Soils with high salinity levels occur naturally in Australia but these were mostly

**confined to** particular costal and sub-coastal areas. Over the past 200 years, the total

area affected by salinization has expanded and has now spread to inland areas.

Groundwater salts that have been accumulating over thousands of years are now rising

to the surface. When this groundwater enters root zone of the cultivated plants which

are naturally not salt tolerated, the plants are dying. The affects are not limited to the

particular cleared site where soil becomes unsuitable for plant production. Salty groundwater can travel along the natural **contours** of the land to the other agriculture areas, creating salty ***discharge sites*** quite some distance from **the recharge zone**. Native **aquatic** and ***land-based*** habitats are now at risk, threating the biological diversity in Australia. It is therefore necessary for groundwater and ***surface run-off water*** to be dealt with.

Land managers or farmers do not have to wait until crops die to realize the salinity levels are out of control. Declining yields in crop production, sick or dying trees around the property or the appearance of salt-tolerant species, all serve as a warning that salinity levels have increased. If these signs are ignored and the lands are degraded then combating salinity will become more expensive and time-consuming than ever before.

One current practice is to replant trees in an effort to draw the water table down and slow the salinization process as well, but this alone will be insufficient indeed. Investigations are also being made into planting salt-tolerant crops and pastures whilst building up and preserving the native species and **remnant** bush-land areas. More effective techniques to **counteract** the drainage problems in the form of drainage **canals** are also being **canvassed.** These hope to achieve a balance between the volume of water entering the soil in the recharge zone and the volume of water that leaves as discharge.

The key to fighting salinity is through long-term management practices on agricultural land that recognize the importance of role that native vegetation plays in keeping water balance in soil.

**Glossary**

1. **Accumulation:** the growth by the continuous additions
2. **Pose:** place, put a position
3. **Disconcerting :** very confusing, worrying
4. **Precautionary:** of, relate to be taking an action in advance
5. **Repercussion:** something happen due to the effect of some actions taken.
6. **Devastation:** ruining
7. **Topography:** geological configuration feature of one area.
8. **Perennial:** lasting for long time (plants whose life cycle are grater than 2 year period)
9. **Waterway:** channel, canal, river
10. **Fibrous:** containing, cost of fibers
11. **Transpire:** emit moisture, escape the watery vapor through the leaves
12. **Leach:** wash away, dissolve out
13. **Grazing**: the pastureland
14. **Substantially:** fundamentally
15. **Contour:** the boundary, the edge
16. **Salt/ heat tolerant:** able to resist particular external factors (salt, heat, .etc)
17. **Aquatic > < Land-based** = Of, in water > < Belong to land
18. **Discharge site:** wetlands take water from the groundwater system.
19. **Recharge site/zone:** wetlands add water to the groundwater system
20. **Remnant**: the leftover part
21. **Canal:** an artificial waterway for navigation, irrigation
22. **Canvass:** look/ consider carefully