



TERRASYSTEM®

Protection of valuable water resources

For our job in soil stabilisation water is enemy No. 1, because it controls the loading capacity of any native soil. The more clayey and silty fines are present, the more sensitive is a soil in respect of plasticity or even liquidity. Here is also the most important impact of the **TERRA SYSTEM®** towards soil betterment and the upgrading of low-class soils to risk-free construction material:

We can control the influence of water and reduce it to acceptable figures;

- By reducing the capillary rise of water we avoid saturation and softening from the ground;
- By controlling the seepage of water we prevent the softening and saturation from the top by meteor water;
- This control can be tailored to obtain fully impervious conditions with the treated soil, and this is a possible major contribution to save fresh, sweet water for human beings.

The **TERRASYSTEM®**, at the beginning developed to improve in-situ soils mainly used in road construction, has shown quite fast that there are many additional possibilities for applications in related fields, as listed below:

- Upgrading of any soil in roads or other earthwork to full water stability;
- Lining of artificial lakes and ponds where rain water can be stored and used as water reserve for the dry season, and even as base for fish farming;
- The fact that it is possible to make the right soil mix completely impervious allows also a wide use of the **TERRASYSTEM®** in landfills as protection layers in the bottom against seepage of effluents into the ground water, but also as protection layer on top to avoid that the most important carrier, the meteor water, can penetrate and leach out the stored pollutants;
- Polluted materials can be successfully treated and sharply reduced in their polluting power, immobilised in part or totally, or covered by impervious, treated soil to avoid the leaching out of pollutants.

The following pages will show you some details in this respect. They give you ideas as to where the **TERRASYSTEM®** can assist in solving the shortage of fresh water by collecting meteor water in ponds and preventing on the other hand the destruction of the water quality by controlling pollution.

TERRA-SYSTEM Bodenstabilisierung Betriebsges.m.b.H.

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A waterless world will not occur, but water shortage can be sharply reduced when the possibilities to collect fresh water are used appropriately.

With the help of the **TERRASYSTEM®** you are able to realise in your country the collection and storage of rain water as a safe resource of fresh water or in the field of erosion control to avoid that fresh water is polluted by those soil particles it eats away from the fertile crust of land. Some ideas will be discussed on the following pages.

Check the situation in your country:

- Are flooding an issue? Do parts of your country are temporary flooded? You have the possibility to form artificial islands in the area by digging artificial ponds or lakes to get sufficient material to construct artificial islands, where human beings but also animals can find shelter if too much water floods their environment.
- Is drought an issue? There are many countries where occurs drought every year or even over a number of years. In such cases the collection of rainwater in artificial ponds or lakes may secure for a longer period enough water to keep animals and plants alive and provide enough water for the human beings. If such reservoirs are big enough, they even offer the possibility of growing fish and in this way contribute to the shortage in food and allow fighting against poverty. It is also possible to cover the pond with a carpet of water plants to keep the water cool for the fishes and to harvest plants for your livestock.

How important it would have been if last year their dikes and dams had been resistant enough to avoid their damage and softening by the water flood, which led to their collapse and huge flooded areas? But how important would it have been if they had had access to collected water in ponds around their agricultural land to avoid the heavy damages of the drought by watering their crops. Mankind is responsible for many problems, also that of the water resources, but has also the possibility and power to do something against it by:

- Using as much as possible of the meteor (rain) water where it can substitute the clean fresh water from springs or wells;
- Contribute to the problems of nature by returning land as far as possible to nature by securing vegetation, where the growth of plants was damaged. dense vegetation and especially forests hold water back and secure a sound water household.
- Erosion control secures this vegetation and repairs the damages human beings have done to nature.



All these actions are intertwined, and therefore it is so important to think about all possibilities of contributing to an improvement in the water management.

The **TERRASYSTEM®** gives possibilities in this respect and it is your imagination asked how to make use with these possibilities in your area - you will find many opportunities...

You read every day in the newspapers about floods around the world, washing away in thousands and ten thousands the habitat of human beings, killing their animals, destroying their belongings - we appear to be helpless against these whims of nature.

THIS NEED NOT BE - the helplessness is often only due to a lack of the right preparatory work, i.e. the prevention of reduction of the above-mentioned damages.

We know about the sensitivity of soils against water and the extreme softening effect if too much water attacks the stability. With the **TERRASYSTEM®** this physical property can be substantially improved.

Preventing erosion secures that dikes and dams will not be washed away, that artificial islands will remain stable when surrounded by the next flood, and the artificial takes built during the construction of the islands will contribute to fighting hunger.

The **TERRASYSTEM®** makes it today much easier to get a successful protection network against floods and at the same time a possible assistance in times of drought.

More than 50% of human beings live in houses built with in-situ soils. Water is to these houses the same threat as for any other earthwork - it softens the soil bricks and lets the houses collapse if they are flooded long enough.

This can be prevented: properly treated soil allows the production of high-quality soil bricks that resist the softening effect of water, because when properly treated with the **TERRASYSTEM®**, the soil becomes impervious.

This gives the local people the possibility of producing with simple machinery equipment their own air-dried soil bricks, build their houses as they like them and get stable swellings which will keep them at the site and prevent their emigration to the overcrowded cities.

Such work will also create local jobs for brick making as well as masonry work. Swelling on water and how to manage it and to save it as far as possible, you also have to think about water pollution.

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Land erosion is one source of pollution, but much more dangerous for the future is the pollution of the environment with the daily trash the people produce and which is thrown away without any responsibility somewhere into the environment.

It is one of our most important responsibilities to draw the attention of our potential customers to the proper fighting against land pollution by trash, and it is also an excellent way to contributing to a betterment of the water resources.

Trash has to be processed or even collected at landfills, but not in the way that it continues there to pollute the environment and especially the ground water. We can substantially contribute also in this respect by constructing landfills where the bottom layer, when properly treated, is fully impervious so that no effluents can get into the ground water and pollute it.

Treated soil will also allow covering such landfills in a way that even surface water cannot penetrate and leach polluting effluents. Such closed landfills only need on top of the treated and compacted top layer a little fertile soil to allow the vegetation to grow on it and close the wound in the nature.. Such tight closed landfills will produce gas, which can be used for cooking and heating over many years.



Compost facility in Austria - 8.000m² TERRA-3000® -stabilized storage area