

## Level one Geography Tutorial 2

### 1. Human impacts at the coast intended to stabilise a coast line can also lead inadvertently to increased coastal erosion. Discuss

Humans have a great impact on coastal areas; these impacts may be of a positive or negative nature. In this essay I will aim to discuss how mans effort to stabilise coastal regions often results in causing more problems, and ever worsening the original problems, which may have existed. To begin with I will talk about specific problems, which result from the human alteration or moderation of a coastal regions.

Modification may take place in a number of forms there are various different methods of protecting coastlines these include the following, groins, jetties, breakwaters, Seawalls, and revetments. Each of these methods has been proven to be of some degree of use, but also each have knock on affects resulting in further erosion.

Sea walls are perceived to be the answer to many different erosion problems at coastlines. They are the most costly coastal protection schemes to construct and can lead to further erosion. The sea walls reflects wave energy back towards the sea, this speeds up erosion and deprives the actual beach of sand as the force of the wave undercuts the wall. This sand would have acted as a natural defence to the coastline; its removal leads to further erosion. Wave reflection from sea walls can also lead to a lowering of the foreshore and undermining of the seawall itself leading to actual failure and collapse of the wall over time. Sea walls that have been placed too close to the waterline can disrupt the sediment balance and cause more erosion in down drift stretches of coastline, especially either side of the wall where a reduction in beach width may become evident.

For some areas a more effective form of protection may be to build groins. These are less expensive and have been used to great effect in some areas. Groins slow down the process of long shore drift, with the up drift side of the structure trapping sand preventing sand from being transported down drift. Groins are built at right angles to the shoreline. It is argued that groins only benefit areas in the up drift regions, and don't have a positive affects on the down drift areas. If this argument were correct erosion would seem be accelerated in down drift regions, therefore the greater number of groins that are constructed on a stretch of bay the greater the erosion down drift, for this reason groins in some locations are not encouraged. Although Groins do trap sediment, they can redirect beach material off shore. This occurs as currents around the structure force sand outwards to the end of a groin, this changes the topography of the surrounding area making it more complex and can lead to mounds of sand a the sea end of groins. Minikin (1952) suggested that groin arrangement and characters must be suited to the beach concerned. This suggests that groins can be affective if situated properly. Although this method of ceasing beach erosion can be very effective, its drawbacks are obvious. Wherever sand on one beach is increased, other beaches down the coast loss a lot of sand. This process often leads to a domino effect. Once one groin is put into place, another is needed at the beach next door.

With the limited affect of the more technical forms of protection becoming more and more evident, trends of coastal protection have now turned to beach nourishment. This basically is replacing lost sand with sand taken from suitable sized sand banks and from deep seawaters. This is an expensive alternative, and may only works on a short-term basis. The sand used to replenish beaches is often withdrawn at the

expense of beaches further up coast. This may not be a problem if the beaches up coast are stable in nature. Sand may be dredged from one point, and may inadvertently be increasing erosion and removing sand from another bay. This problem may arise when not enough observations and sampling are carried out. More often than not the erosion, which first caused the need for nourishment, will act upon the newly placed sand, and the situation will not improve greatly.

Another solution to coastal erosion, which has been discussed widely in recent years, is the construction of off shore breakwaters. Breakwaters are constructed by strategically placing, offshore, a line of large boulders parallel to the shoreline. The effect these have is to limit the energy of the waves before they reach the coastline and create an area of calm water behind them called a wave shadow. A breakwater off Santa Monica, California resulted in interference with the long shore drift; this produced a large deposition of sand behind the breakwater, and increased erosion down current. Up coast from breakwaters the shoreline may advance but in contrast to this the down drift side of the shoreline can erode quite severely. As well as this not enough research has been carried out as to where the best place to situate them is in respect to the beach, or cliff line.

### **Conclusion**

There are many types of coastal defence schemes each of which have positive and negative effects on protecting land and property from the sea. Whatever man made features are made there is a good chance that they will interfere with the natural

movements of beach sediments. This may lead to increased erosion in certain areas eventhough the structure was originally desighned to prevent this problem.

## REFERENCES

Paul d. Komar (1976) "beach Processes and sedimentaion"

Bird, E.C.F (1987) "Coasts"

Simon K. Haslett (2000) "Coastal systems"

Karl F. Nordstrom (2000) "Beaches and Dunes of Developed Coasts"

Bird E.C.F (1985) "Coastline Changes"