

## Channel Morphology

The amount of sediment depends upon climatic factor. Such as in rainy season the amount of water is more. So a large amount of sediment comes and deposit. But during the winter deposition of sediment decreases as the amount of water also decreases.

### Consequence of Aggradation:

**(1) upstream side:** At winter Q And both are less at the upstream side. at the advent of rainy season the rain water washes away the excess amount of materials into the river. If the excess sediment or load exceeds the capacity of the river then aggradation takes place and excess sediment are accumulated in the river bed. So the river bed rises. But in the meantime the downstream side remains on the same level. So slope increases and velocity towards downstream increases. So capacity increases and bed materials are eroded from the downstream side. More materials are accumulated on the upstream side and slope becomes steeper and more materials are dragged away from the downstream side.

**(2) Downstream side:**

**(3) Channel cross-section:** From narrow and deep the cross section becomes wide and shallow.

Wide and shallow rivers are the most available types of river commonly found in Bangladesh and narrow and deep rivers are the example of hilly river. It is based on the ratio of width/depth ratio. The narrow and deep rivers are converted to shallow and deep by the formation of sand bars. Let we assume a rivers having several sand bars. When the flow of water hits upon a bar, the flow is bifurcated and a component of the flow hits upon the sides of a river. So the river side corrodes. This erosion of river side again produces another on an alternate location. Thus the flow is again bifurcated on that bar and hits the other side of the river. Thus eventually the river changes its path of flow. This zigzag character of river flow is known as meandering. After a long spell of time it may occur that the river again changes its direction. Such kind of channel is known as "Breaded Channel". The river Jamuna of Bangladesh is a breaded channel. Breaded channel is the most uncertain kind of channel of the river. That's why it is very difficult to construct bridge over such a river.

Variation of the channel morphology with the downstream distance of channel:

**(1) Stream discharge:** When the river flows from upstream to the downstream the total discharge increases. Amount of discharge is directly related to the area covered by the channel or river. In n this curve at the left side, the drainage area covered by the drainage system is small. So discharge is small. Again at the right side of the curve as the river goes downstream the amount of discharge increases with the simultaneous increment of drainage area cover by the system. Maximum rivers of Bangladesh are downstream rivers. Moreover they traverse a long distance before entering Bangladesh. The big rivers

of Bangladesh such as the Ganges, the Brahmaputra travels a total drainage area of 7 times compared to Bangladesh. So a huge discharge flows over Bangladesh. Hence flood is obvious in Bangladesh.

**(2)Channel width and depth line:** From upstream to downstream both channel width and channel depth increases. But width increases more than depth. That means width/depth ratio increases from upstream to downstream. If width/depth ratio increases it indicates that the rivers are getting wider and shallower. .Whereas decreases in width/depth ratio indicates that the river are getting narrower and deeper.

**Mean flow velocity:** We know that total discharge,  $Q=A*v$ ;

As total discharge (Q) increases to the downstream side then the channel become wider and deeper. So A increases. To balance this two the mean flow velocity, v also increases. But not a large extent. So in Bangladesh the flood water stays for longer duration.

**Bed material grain size:** As the river flows to the downstream the size of the bed material decreases. The hilly river of Sylhet contains pebbles, gravels, stones etc. as they are situated in the upstream side. But the southern rivers contain fine sand as they remain in the downstream side.

Bed material discharge: The sediment that is stored in the river bed is known as stored alluvium. All the Bangladeshi rivers are alluvial rivers. That's why the Bangladeshi landform is an alluvial landform.