



"TOSHKENT IRRIGATSIYA VA QISHLOQ  
XO'JALIGINI MEXANIZATSIYALASH  
MUHANDISLARI INSTITUTI" MILLIY TADQIQOT  
UNIVERSITETI

SCIENCE : **Hydrology of dry**

subject

**05**

**Natural geographical  
features of the river  
basin**



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Gidrologiya va  
gidrogeologiya kafedrası  
dotsenti

# Plan:

- Geographical location and geological structure of the river basin. Topography and climatic conditions of the river basin.**
- Soil and vegetation cover, hydrography of the river basin.**
- Morphometric characteristics of the river basin.**

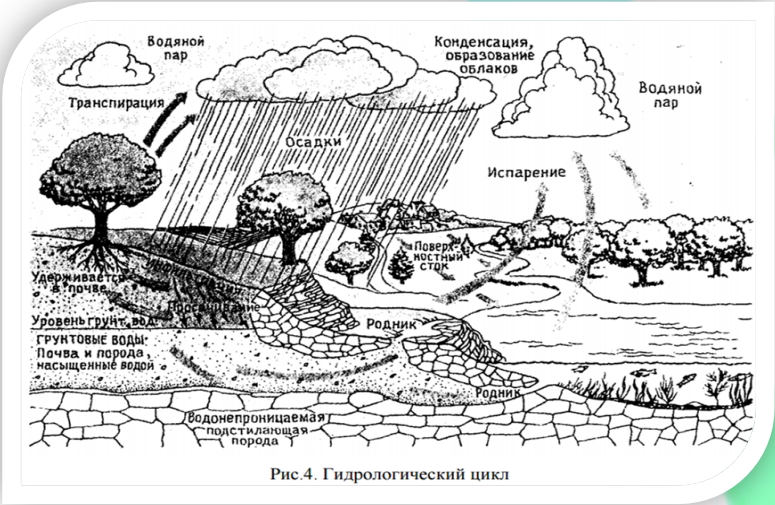
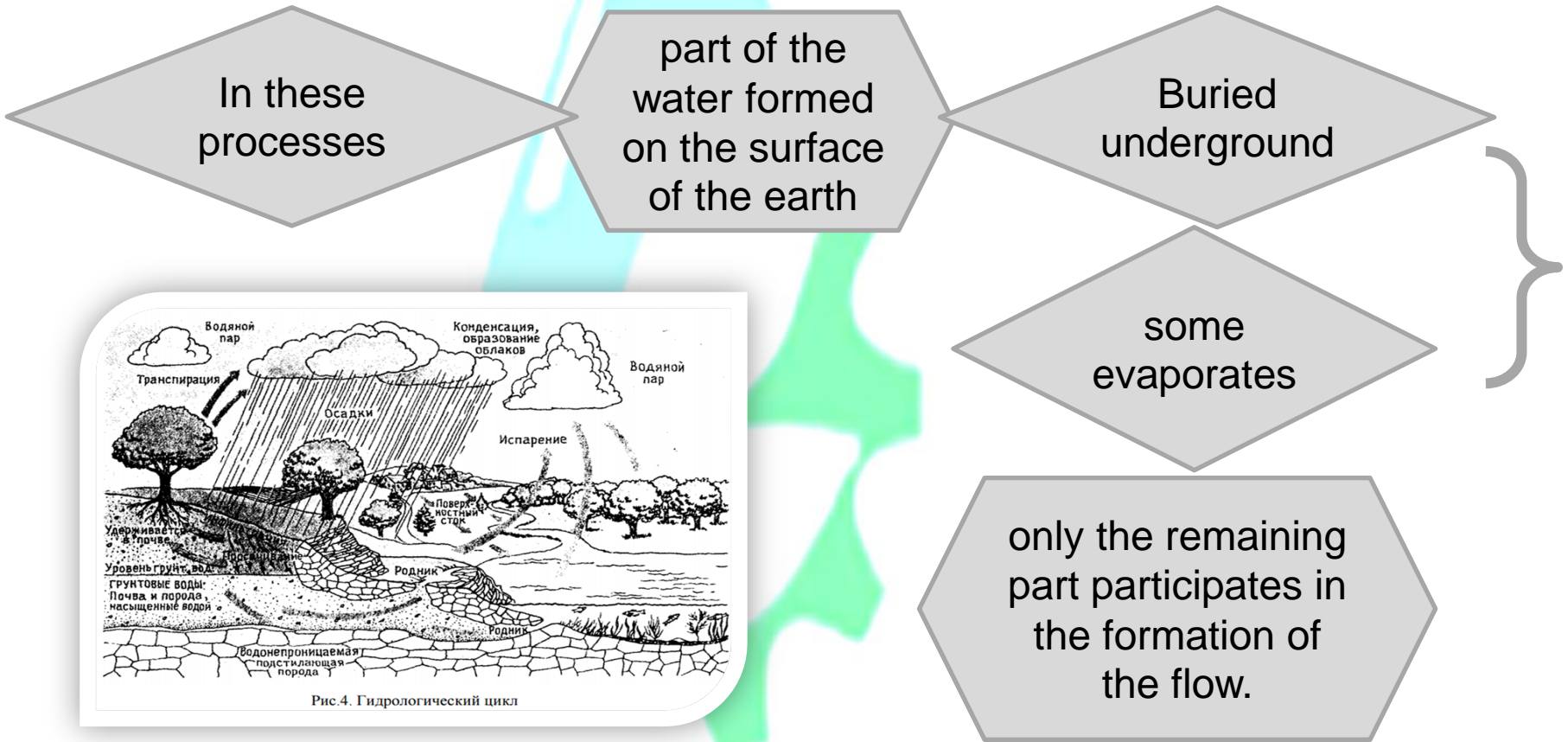
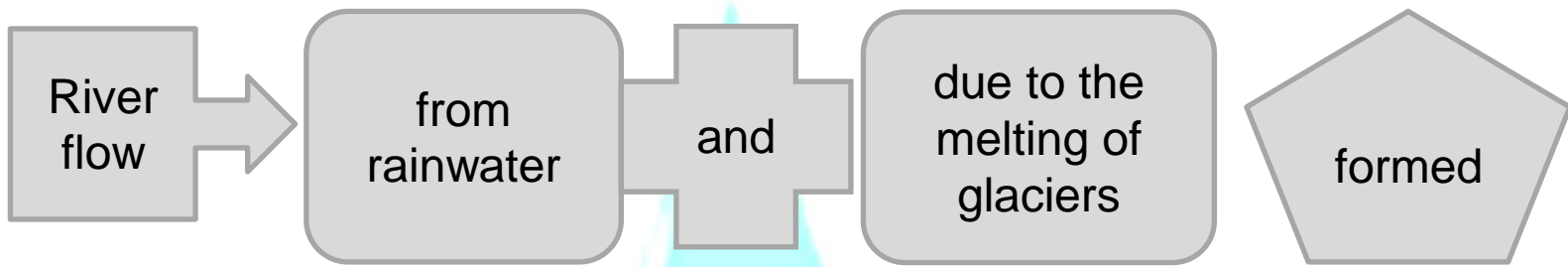
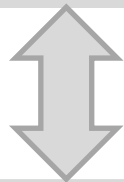


Рис. 4. Гидрологический цикл

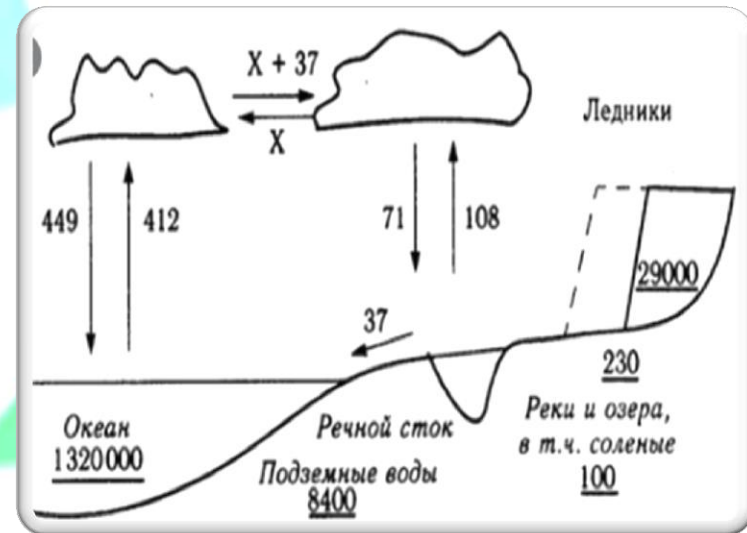
# Flow formation

Rate of precipitation or melting of snow and ice



only when it is greater than the combined speed of underground absorption and evaporation

current is formed.



At first, the flow will be in the form of rivulets

small stream are added



temporary running water



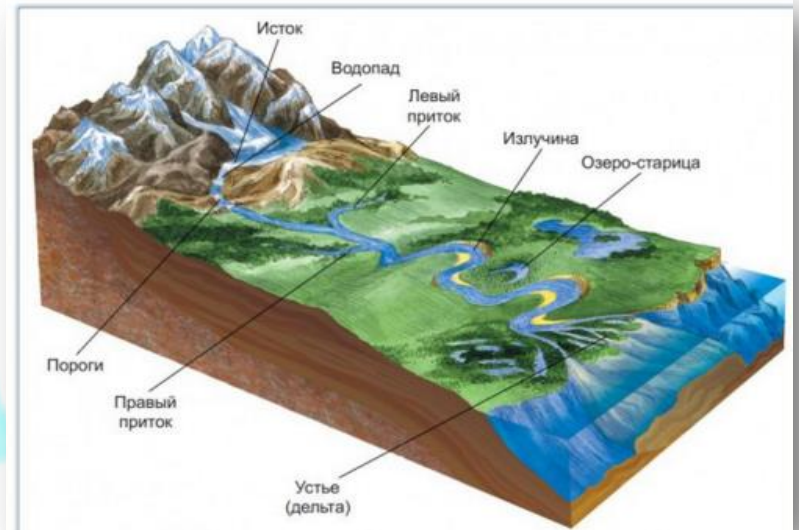
It forms continuous flows in its course



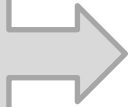
streams from joining water



a river flow is formed

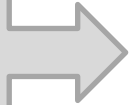


To the river



underground water is also added

River flow



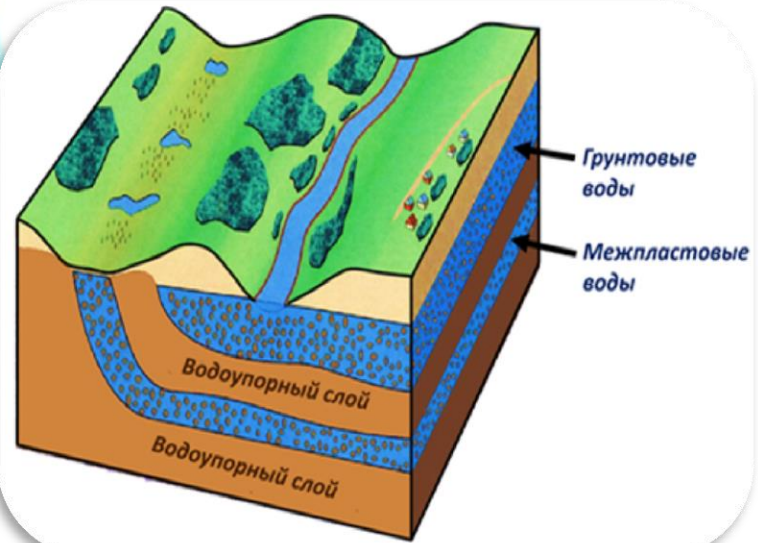
the surface of the earth



of groundwater



will consist of the sum of



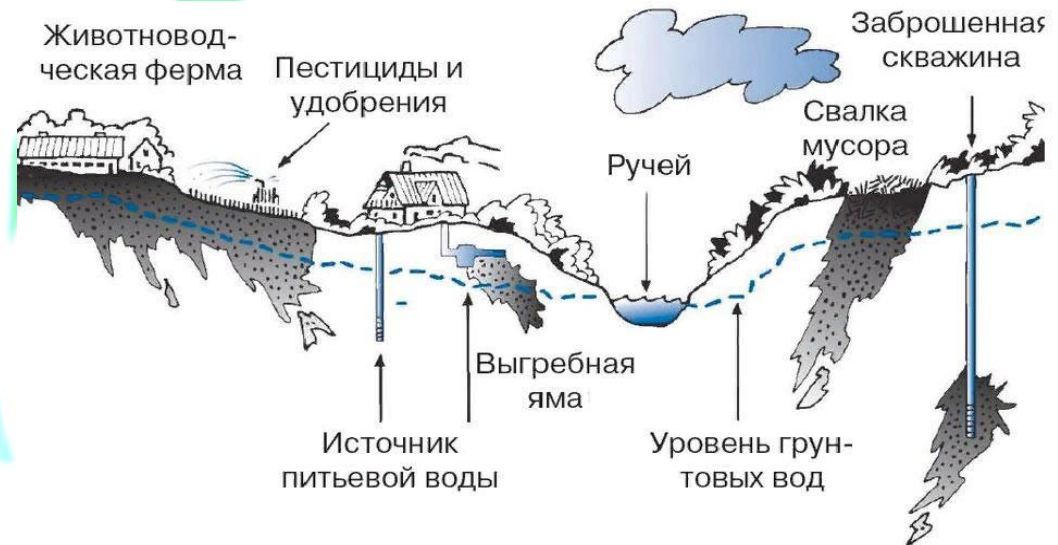


To the process of flow formation

human economic activities in the river basin also have a serious impact

Влияние хозяйственной деятельности на режим рек можно разделить на две группы:

- с прямым воздействием на сток;
- с косвенным воздействием на сток.

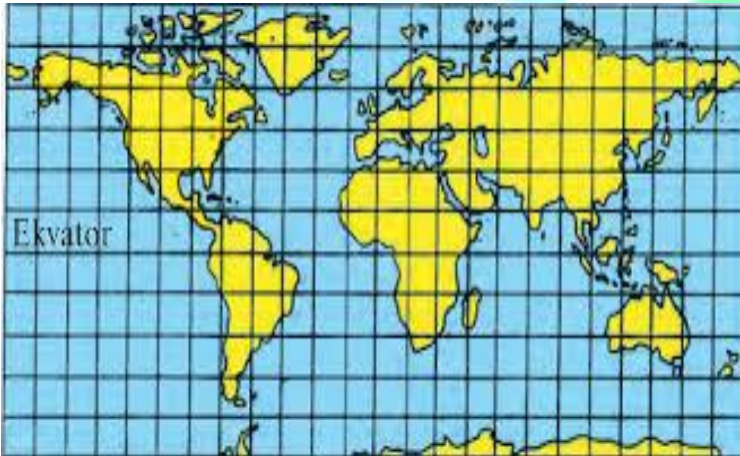




Geographical location of the river basin

the most extreme southern and northern points of the area where the river basin is located

the most extreme western and eastern points are meant



If we have this information

in which continent of the river basin

in which latitude

in which country it is located

we will get an initial idea about it

Conditions for the accumulation and consumption of surface and groundwater



geological structure of the basin

lithological composition of rocks

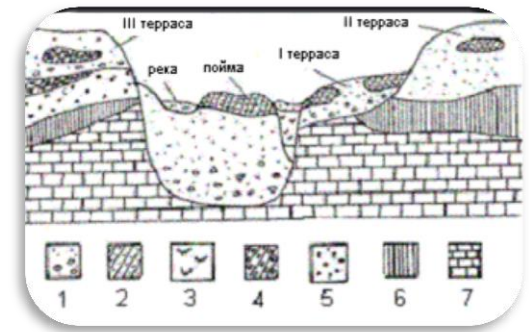
depth of impermeable layers

to the formation of current

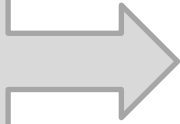
to the amount

will be distributed throughout the year

is one of the major influencing factors



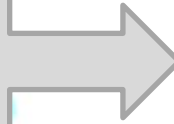
Direct influence of relief on flow



expressed by the slope of the basin

if the slope of the basin is large

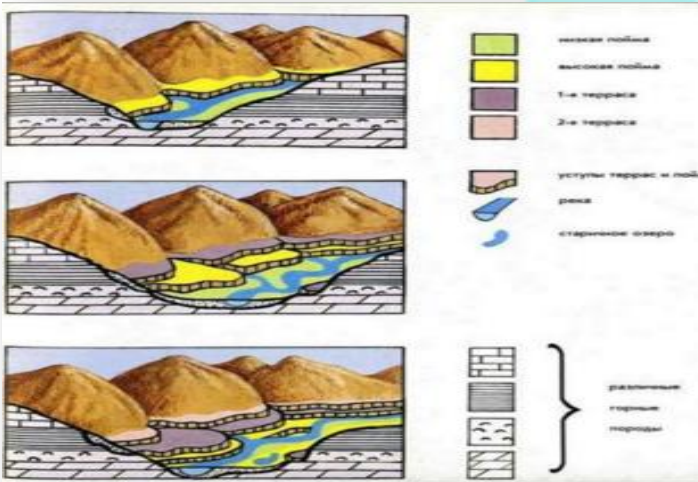
the current is formed at a rapid pace



the time to flow to the river bed is reduced



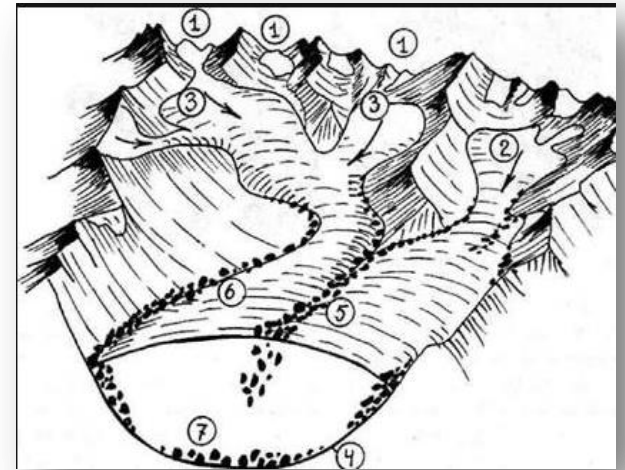
a small amount of water is used for seepage and evaporation.



Indirect influence of basin topography on flow formation

the river basin was the main element of the water balance

it is sensed through precipitation, evaporation, seepage into the ground, and the amount of water that accumulates in the basin.



In terms of climatic factors

atmospheric precipitation

evaporation

air temperature

air humidity

the wind

To find out which of these factors has a decisive and direct effect on the flow

$$X_0 = U_0 + Z_0$$

=

$$U_0 = X_0 - Z_0$$



- Климат влияет на:
- 1.МНОГОВОДНОСТЬ РЕК
  2. ПИТАНИЕ РЕК
  3. РЕЖИМ РЕКИ
  4. ЛЕДОСТАВ НА РЕКАХ

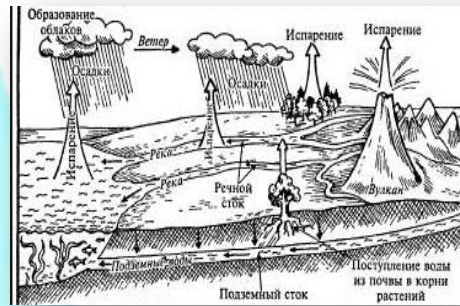
На основе анализа климатической карты выявите это влияние?

$X_0$ - the average multi-year precipitation amount falling in the basin;

$Z_0$ - average multi year evaporation amount from the basin;

$U_0$  - the average long-term amount of the river flow.

The main elements of climate that affect the river flow



atmospheric precipitation



evaporation



The more rain falls in the river basin under the same natural conditions

the current is generated in such a large amount

Analytical representation of the relationship between them

$$U_0 = f(X_0)$$

Effect of soil cover on flow formation

characterized by water absorption and ability to retain absorbed water.



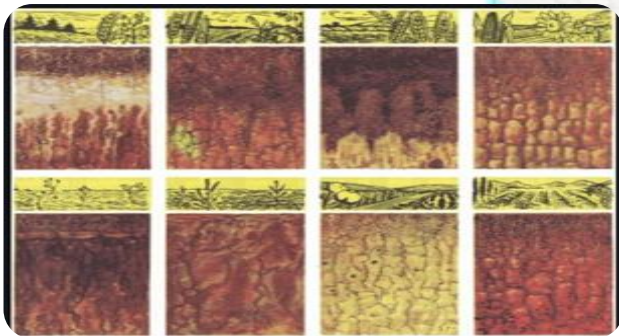
The larger the size of the soil particles



absorbed as much water

For example

sandy soil absorbs 5-10 times more water than clay soil.

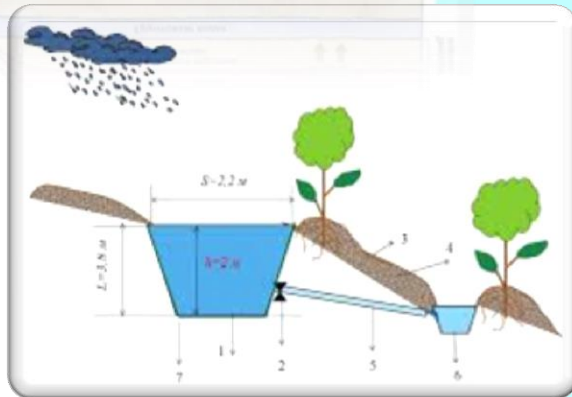
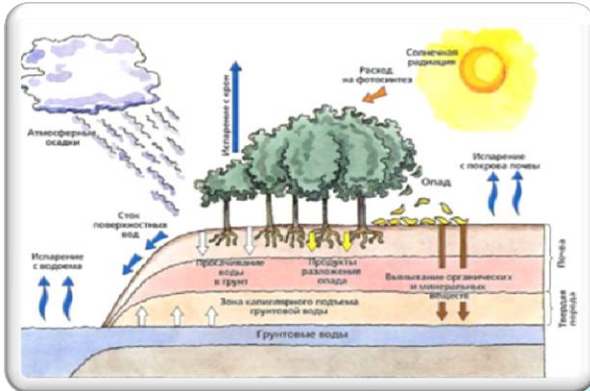


# Effect of vegetation cover on flow formation in the river basin

plant cover

holding a part of atmospheric precipitation

with the help of its roots, it constantly takes a certain amount of moisture from the soil and allows more of the precipitation to evaporate;



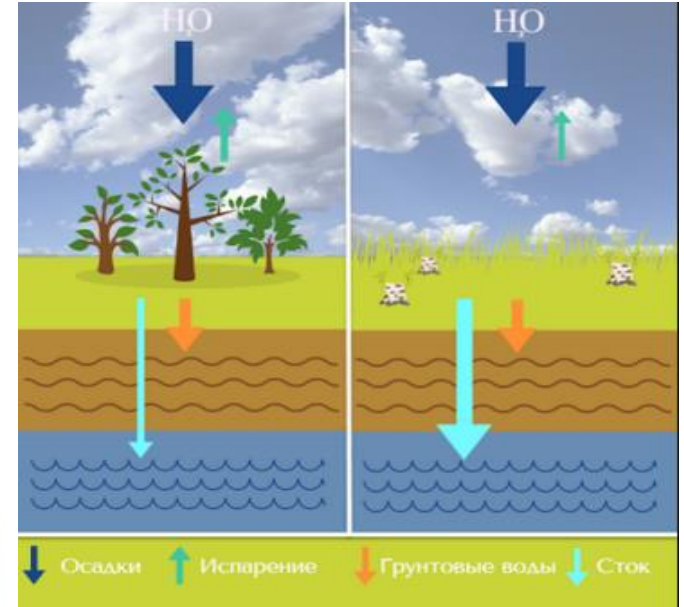


plant  
cover

blocks the surface of the soil with its body, does not allow it to heat up and, as a result, reduces the amount of evaporation

increases the roughness of the earth's surface, which reduces the rate of water runoff on the surface and allows more water to seep into the ground

Forests slow down the melting of snow on the surface of the earth and thereby increase its seepage into the ground.



# Effects of lakes, marshes and glaciers

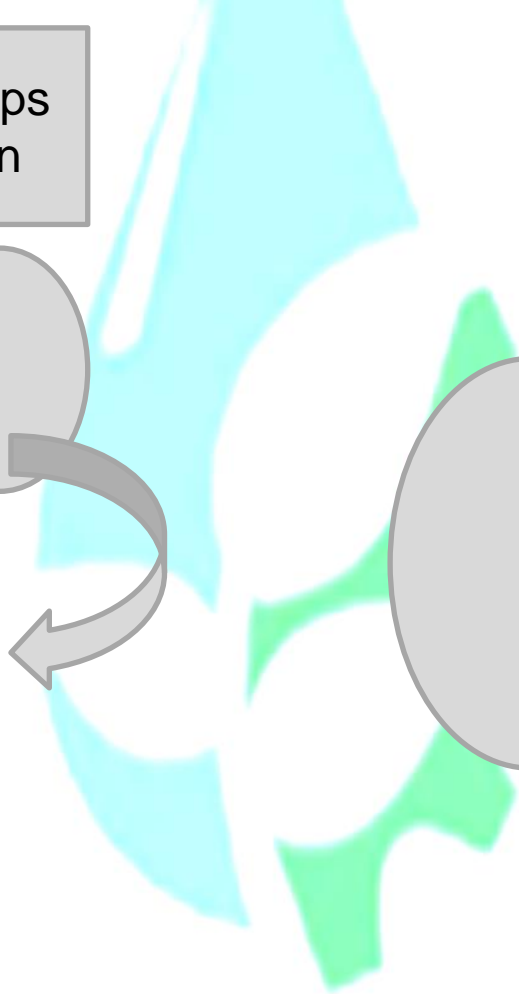
Lakes and swamps  
in the river basin

controlling  
the flow to  
a certain  
extent

causes its  
relatively even  
distribution  
during the year.

**The same points  
can be made about  
wetlands as above**

Their  
influence on the  
river flow is  
significant in the  
northern regions.



Influenced by lakes in the basin

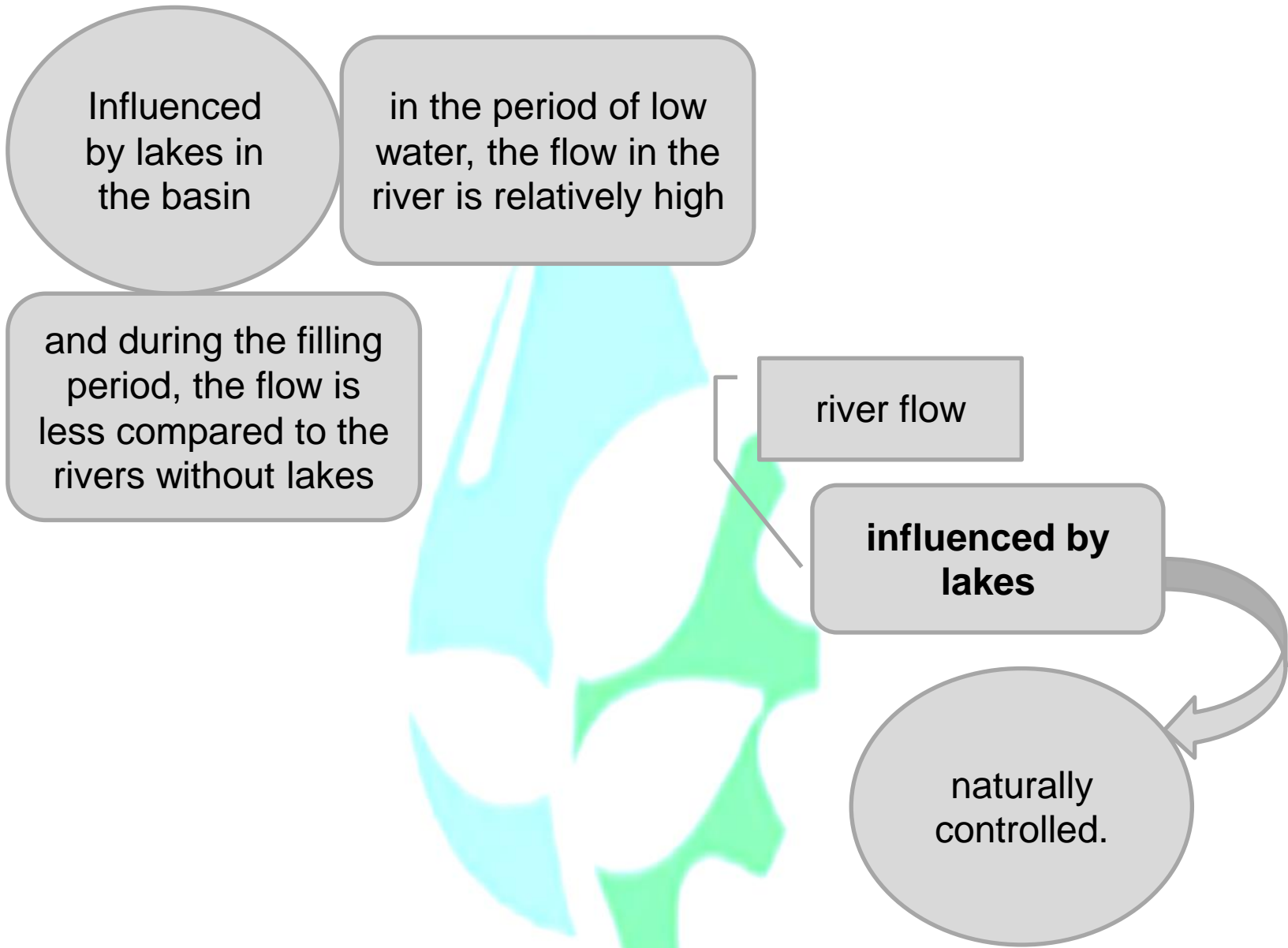
in the period of low water, the flow in the river is relatively high

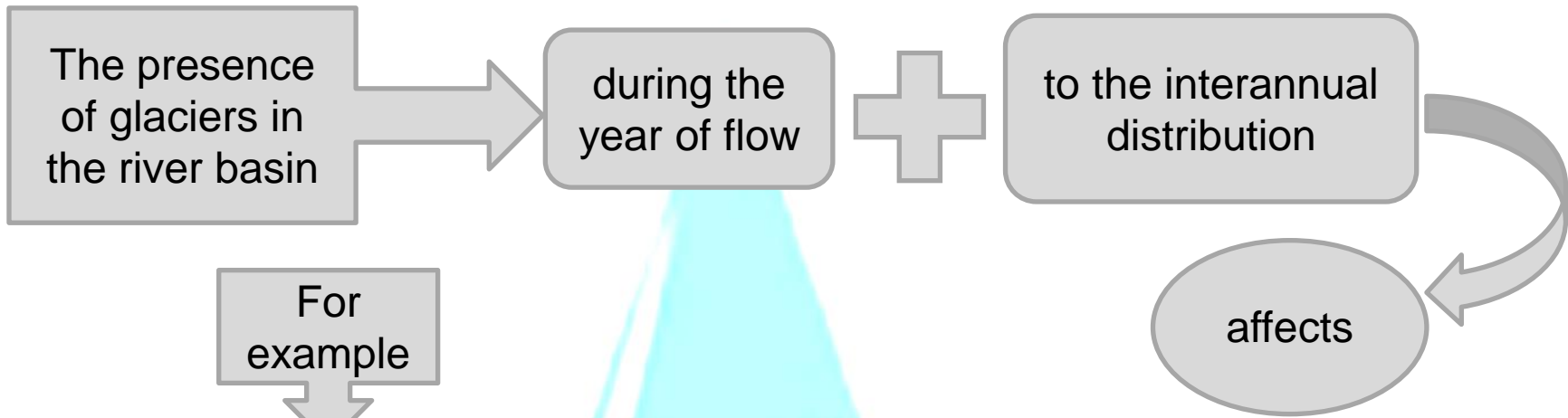
and during the filling period, the flow is less compared to the rivers without lakes

river flow

**influenced by lakes**

naturally controlled.





For example

The main part of the flow of rivers (Zarafshan, Norin, Vakhsh) fed by glaciers in the mountains of Central Asia falls in July-September.

The heat balance during this period changes less from year to year, and therefore the amount of flow also changes less from year to year.

The influence of human economic activity on the river flow

construction of reservoirs, hydroelectric power stations (GES).

inter-basin redistribution of river flow

expansion of the area of irrigated land

draining wetlands in the river basin

water supply to large cities and settlements

agrotechnical activities in large areas where rivers collect water

water supply to large industrial enterprises (paper-making, chemical, metallurgical, textile)

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# THANK YOU FOR YOUR ATTENTION!



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