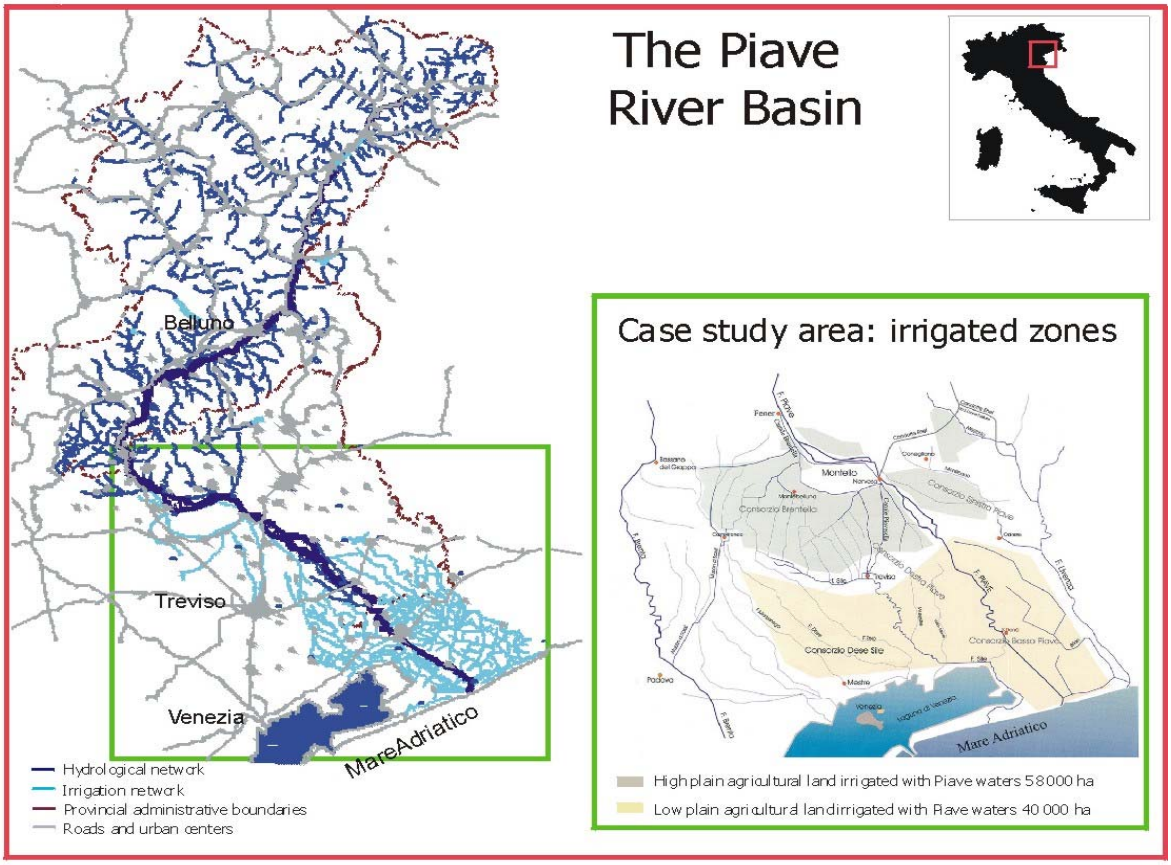

The Piave River is the fifth most important river in Italy. The Piave basin is situated in the north-eastern part of the Italian peninsula. The area of the basin is **4,100 sq. km**; the main course of the river is **220 km** long.

In the basin there are **127 municipalities** that include important cities, industrial centres and touristic areas. The basin is populated by **381,000 inhabitants.**

The Piave River basin is characterised by an **artificial system** of water resources built between 1920 and 1960. It is, in fact, an artificial hydrographic network placed over the natural system for the use of hydroelectric power. There are in the Piave basin 22 hydroelectric power plants. There is the natural river which no longer shows signs of life and an artificial river which, on the other hand, is hydraulically very lively, composed of reservoirs, 6 big dams, 17 penstocks, tunnels, sluice gates, line canals, etc. The artificial system has radically changed the hydrologic form of the river, modifying the fluvial dynamic, the transport of solid materials and the landscape of the riverbed.
In the artificial system of the Piave, the terrible Vajont catastrophe must be remembered: a 250 million cubic metre mass of rock slid into the lake in October 1963 causing a wave which destroyed the Piave valley, killing more than 2,000 victims and wiping out whole villages. The Vajont disaster also deprived the system of a volume of 150 million cubic metres of water which were needed to complete the artificial system for the exploitation of the water resources of the Piave.

The average annual **precipitation** in the Piave basin is more than **1,500 mm**: higher than the national average of 1,000 mm. It has always offered a wide availability of water resources to satisfy different demands. However, in the last 50 years the increase of water demand has not been able to be balanced by a sufficient offer. It has brought about a conflict between new requirements to give back water to the river, safeguard the natural environment, and the strong hydroelectric power and irrigation system.

In the Piave basin there is a certain tendency towards the increase of phenomena of maximum intensity. Experts on climatic variations usually call this **tropicalisation of the climate**. Instead of a substantially constant annual rainfall, precipitation is concentrated ever more frequently in short lived events. This emphasises the impetuous nature of the river where the flood discharge during the most significant events reaches maximum values of 3-4,000 cu. m/s. Instead, periods of minimal discharge are concentrated in the winter and summer months and often have the characteristics of a period of drought. As regards the water balance, only a small part effectively reaches the sea. In fact, in the drier periods, the discharge into the sea is only a few cubic metres per second. This is due both to the diversions caused by the large hydroelectric and irrigation plants and to infiltration of the residual flow inside the gravel deposits which characterise the river bed in the higher part of the plain.

The usage system. The Piave River's waters are used for *civil* and *industrial purposes*, *irrigated agriculture* and *hydroelectric generation*. Along with such uses the water required for landscape-environmental quality and also for *tourism* on the lakes and the river must be included. The aim is the recovery of a volume of water to maintain or release into the river bed to guarantee the *minimum vital flow*. That is, the discharge necessary to guarantee the safeguarding of the physical characteristics of the river, the chemical and physical nature of the water, as well as maintaining the biotic community typical of natural local conditions.
The current uses along the river can be distinguished in two broad categories in relation to the amount of water derived.
The first category (with total consumption of some cubic metres per second) turns out to be civil use, including drinking water and small industry.
The second category (with total extractions to the order of ten cubic metres per second) includes hydroelectric generation and the water supplied for irrigated agriculture.
The Piave River is significantly altered by the effects of water use, particularly those for hydroelectric generation and irrigation that have progressively increased water extraction and, hence, damage to river flow.

Irrigated agriculture. The use of the Piave water for agriculture and irrigation is fundamental, but at the same time very problematic and unsustainable.
100,000 hectares of agricultural land is irrigated by the Piave water. The irrigated system uses most of the available water resources of the Piave river, 60% during the year up to 70% during the summer months. The flows taken by the river to irrigate the land are given back only minimally through the underground stratum while 50% is lost in the processes of evaporation.

The conflict. The situation in certain summer periods become highly conflictual. The maximum water demand occurs in these months because unless agriculture has water the seasonal production will be lost. There is the maximum influx of tourists in the

mountains with the need to have water in the river beds in the mountain fluvial system and to have lakes at the maximum level to use those places touristically. At the same time in August, it is necessary to produce hydroelectric power even if during this month the level is minimal because the factories are closed for summer holidays. In the summer months in the fluvial section of Nervesa della Battaglia at the outlet of the basin, where the river starts to flow into the plain, the natural discharge should be on average around 100 cubic metres a second. However, the irrigation concessions granted account for exactly 98 cubic metres a second. Thus, for that section, for all the tract of plain to the sea, there is no more water in the river bed. All the water produced by the river is withdrawn for agriculture. Besides this, the figure of 100 cubic meters per second is only apparent due to the fact that an average value does not take into account years or months of drought. When these conditions occur the system goes into a crisis, as happened in summer 2003, and the conflict is particularly heated.