The Alps have undergone an exceptionally high temperature increase of around +2 °C between the late 19th and early 21st century, more than twice the rate of average warming of the Northern hemisphere. Furthermore, a slight trend towards an increase in precipitation in the north alpine region (Viviroli and Weingartner, 2004). Hence, the water system of the Alps is very important not only for the Alps and their discharge is transported via river systems to lower-lying areas. The Alps are crucial for major rivers — mainly Danube, Rhine, Po and Rhone — flowing from the region, from 26 % (Danube) to 53 % (Po) (Weingartner et al., 2007). Most of the major European rivers have their headwaters in the Alps and to increase the range of freshwater resource runoff. 

5.1.2. Glacier metamorphosis

Glacier metamorphosis is a factor affecting avalanche. Avalanches occur on steep slopes above 1200m of altitude is the main source of snow for local community economy. Snow making is used to avoid avalanche and to increase the range of skiing in winter. Based on model simulations, they found that an increase of 2 °C may cause enormous consequences for the skiing industry. 


Increased water withdrawal due to increased population and water withdrawal for agriculture and domestic use. 

Increased water withdrawal due to increased population has serious health consequences. 

5.3. Adaptation to climate change

In the face of increased water withdrawal, efforts are being made to adapt to climate change. These include:

- Increased water abstraction for agriculture and domestic use
- Increased water abstraction for industry

6. Artificial snow usage growth

The use of artificial snow has increased over the years, as shown in the graph below.

![Graph showing the increase in artificial snow usage growth](image_url)