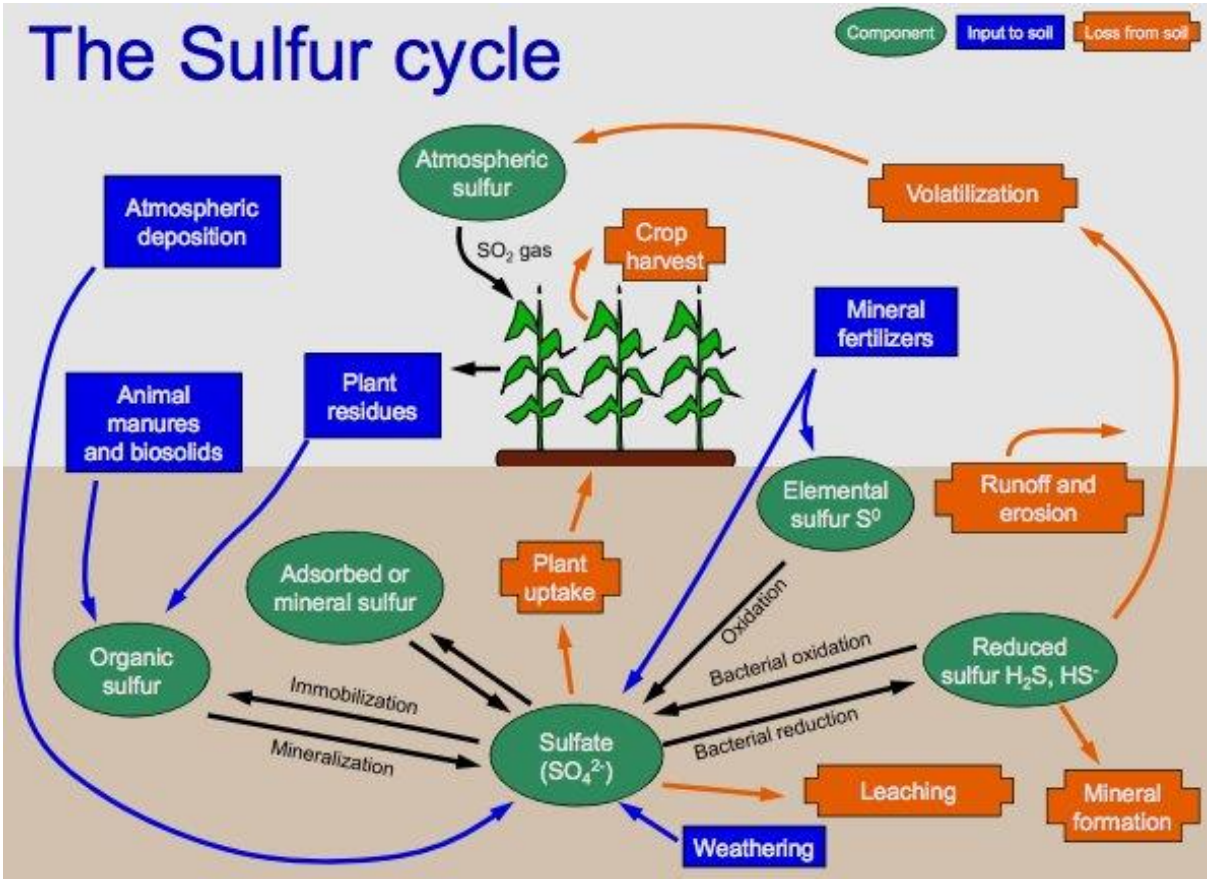
Sulphur Cycle

Sulphur is one of the most abundant elements on the earth. It is a yellow, brittle, tasteless, odourless non-metal. Sulphur is present in all kinds of proteins. Plants directly absorb sulphur-containing amino acids such as methionine, cystine, and cysteine.

Sulphur is released into the atmosphere by the burning of fossil fuels, volcanic activities, and decomposition of organic molecules.

On land, sulphur is stored in underground rocks and minerals. It is released by precipitation, weathering of rocks and geothermal vents.



Sulphur Cycle

The process of sulphur cycle is explained below:

- The sulphur is released by the weathering of rocks.
- Sulphur comes in contact with air and is converted into sulphates.
- Sulphates are taken up by plants and microbes and are converted into organic forms.
- The organic form of sulphur is then consumed by the animals through their food and thus sulphur moves in the food chain.
- When the animals die some of the sulphur is released by decomposition while some enter the tissues of microbes.

- There are several natural sources such as volcanic eruptions, evaporation of water, and breakdown of organic matter in swamps, that release sulphur directly into the atmosphere. This sulphur falls on earth with rainfall.

- Steps of Sulphur Cycle
- Following are the important steps of the sulphur cycle:
- Decomposition of Organic Compounds
- Protein degradation releases **amino acids** that contain sulphur. Sulphates are reduced to H_2S by the action of Desulfotomaculum bacteria.
- Oxidation of Hydrogen Sulphide to Elemental Sulphur
- Hydrogen sulphide oxidises to produce elemental sulphur. Certain photosynthetic bacteria from the families Chlorobiaceae and Chromatiaceae initiate the oxidation process.
- Oxidation of Elemental Sulphur
- Elemental sulphur present in the soil cannot be utilized directly by the plants. Therefore, it is converted into sulphates by chemolithotrophic bacteria.

Reduction of Sulphates

Sulphates are reduced to hydrogen sulphide by *Desulfovibrio desulfuricans.* This occurs in two steps:

- Firstly, the sulphates are converted to sulphites utilizing ATP.
- Secondly, the reduction of sulphite to hydrogen sulphide.