

B STORAGE FUNCTION OF RESERVOIRS

The aim of the storage function of reservoirs is to assure a better supply of water for users and consumers than withdrawal from natural river flow can provide. The design of a reservoir therefore depends mainly on the needs to be met and on the water sources available.

A comparison of the water demand with water resources available (e.g., the quantity and quality of the water) forms part of the Czechoslovak Water Management Plan. The individual steps in the water supply balance are shown in Fig. 3.1.

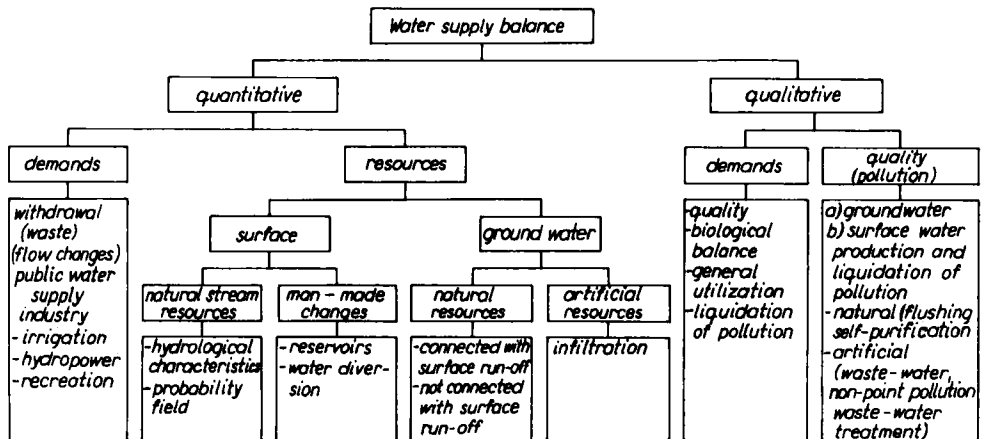


Fig. 3.1 Diagram of sub-division and contents of water-management balance

Descriptions of reservoirs construction of which started in 1975, and those which are planned up to the year 2000 and even later, were prepared for the Water Management Plan of the Czech Socialist Republic (1975) with a layout for each at a scale of 1:50 000 to outline the purpose, and to present the technical and economic parameters of the reservoirs.

This plan serves as the basis for any future design. From the very beginning it must be clear whether the reservoir will be (Fig. 3.2)

- (a) – a single reservoir
- (b) – a single lateral reservoir
- (c) – a single compensation reservoir
- (d) – part of a cascade
- (e) – part of a system

The next step is to determine the water yield and the demand, i.e., the gross balance of the water supply: whether the required annual withdrawal $\sum O_r$ will be covered by the water source with the required reliability of $\sum O_{r,p}$ or at least the mean long-term flow $\sum Q_a$. A minimum permissible maintained discharge downstream of the dam, due to water losses, etc., must also be taken into consideration.

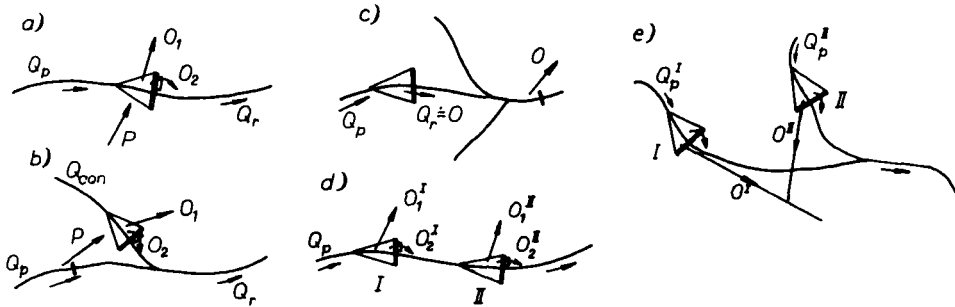


Fig. 3.2 Schematic representation of reservoir positions

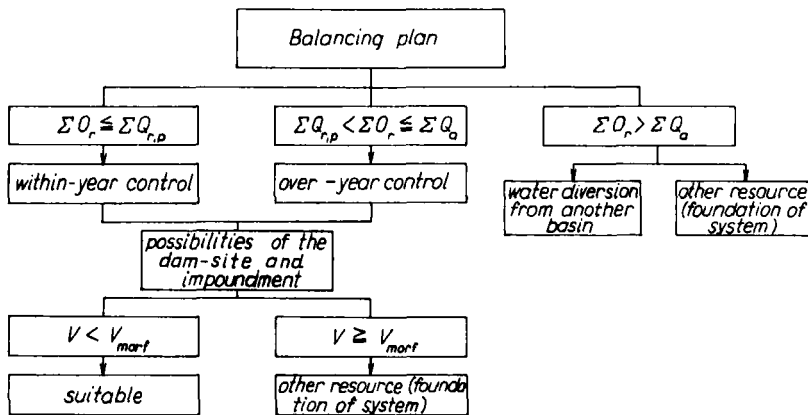


Fig. 3.3 Flow chart of basic considerations for the design of a storage reservoir

Finally, the realistic localization of the necessary reservoir volume V has also to be evaluated with a view to the morphological and geological possibilities, V_{morf} , of the dam site and the valley.

The scheme of such a diagram of considerations and their results is shown in Fig. 3.3. If $V_{morf} > V$, we have to evaluate whether the suitable locality could not be utilized to satisfy further needs of water management, apart from the main purpose to be satisfied by the investment task.

The solution of the reservoir consists in the preparation of the basic data and plans and the actual technico-economic plan.