Lake Victoria to effect the water supply at the lower end of the system, some six-weeks lead time is required.

Keeping in mind all of the above requirements and constraints, system management must continually ask such questions as, "What will happen if we do such and such? What are the short-term effects? What are the long-term effects? What would be the effect of constructing a new reservoir at a particular location?" The models shown on the slide helps management answer these questions by providing an integrating logical description of all component elements and their interrelationships, and, by permitting the computation of numerical results relating to the consequences of various possible actions. Actually, the slide shows three models. First there is the map of the Upper Nile System.

Since management was not really interested in the twists and turns of the river, but in the flow that it transmits, and the water losses that occur during flow, the geographic map over on the left was transformed into a kind of hydro-dynamic map, which is right next to the geographic map.

The second model now represents a system in a form reduced to characteristics that are significant with respect to the purpose for which the model was intended. Finally, to permit numerical computations a mathematical model was constructed from the hydro-dynamic map. This third model, represented by the two boxes on the right, and these contain various equations, shows the equations of flow of the system together with such basic constraints as reservoir capacities and permissible water levels.

This model has the flexibility to support top-management planning by developing the consequences of alternative policies or modifications to the system. These consequences may be individually simple events, but in a large system operating over a period of time, they form an intricate chain of circumstances, the estima-