

WATER RESOURCES CONFLICTS IN AN
INDUSTRIALIZED DENSELY POPULATED AREA
- theory and methods of conflict dynamics

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SYNOPSIS

The land use in Western Skåne is at the moment highly exploited for agriculture and expanding urban areas, mainly near the coast. The Kävlinge river basin is, with a few small exceptions, an area which is made full use of for water supply to urban areas, industries and a rapidly growing irrigation in agriculture. The river is as well used as a receiver for waste water. Both activities affect the water situation in the river quantitatively and qualitatively. The land in the river basin is almost everywhere of very good quality and attractive for agriculture. There is also a great pressure from the public to use the river basin for recreational activities.

The water conflict situations for land and water use in the region is focused around the Vomb-lake, in the middle of the river basin. At the moment we can identify fifteen different agents with different demands on land and water use around the lake. The focus of the research project, which is presented in the paper, is

- to outline a social theory to understand the relations between planners with different demands
- to identify all agents with demands on water and land use in the area
- to outline models where all agents can act in a common planning process
- to indicate plausible conflicts in the near future
- to indicate the circumstances for time periods with great divergencies in demands

Résumé

La Scanie, province méridionale de la Suède, a une densité de population et un activité industriel relativement élevée par rapport aux autres régions du pays. Dans cette province, les terres et les ressources en eau font l'objet d'une forte concurrence entre les agglomérations urbaines en expansion, l'agriculture et l'industrie. La majeure partie des ressources en eau se trouvent dans le bassin de la Kävlinge, une région où règnent également d'intenses activités de récréation et de tourisme. Dans cette région, l'utilisation des terres et des ressources en eau est devenue une source de conflits qui vont en s'intensifiant et qui se sont concentrés dans certains sites stratégiques.

L'article présente une théorie dynamique des situations conflictuelles qui est utilisée pour l'analyse des conflits qui ont surgi autour du lac Vombsjö, situé dans le bassin de la Kävlinge. L'objectif de cette théorie est d'élaborer une méthodologie incluant le recours à la collaboration de habitants et des exploitants et visant à résoudre les conflits nés de situations où plusieurs parties intéressées veulent faire valoir leurs droits sur les terres et les ressources en eau d'une région donnée.

Resumen

Skania en el sur de Suecia es una región densamente poblada e industrializada en comparación con el resto de Suecia. Aquí existe una competencia tanto en los recursos de terrenos como de agua, para expansionar zonas urbanas, zonas agrícolas e industrias. Dentro de la zona se encuentran la mayor parte de los recursos de agua, en la zona del río Kävlinge, y que al mismo tiempo se aprovecha mucho como zona de recreo de la región. Durante más de medio siglo, los conflictos sobre terrenos y agua en la región se han concentrado en las pocas zonas que hay en la zona del río.

En el artículo se presenta una teoría dinámica de conflictos, que se ha empleado para analizar los conflictos en la zona de Vombsjö dentro del sector del río. La finalidad con la teoría de conflictos es generar métodos de solución de conflictos y métodos para la colaboración de los ciudadanos en situaciones en que muchas partes tienen distintas reivindicaciones sobre los recursos de terrenos y de agua.

1. Introduction to the region

The Skåne area (figure 2) constitutes an important part of the Swedish economy. Its current role is indicated by Table 1.

Table 1. Selected Indicators on the Relative Importance of the Skåne Area in the Swedish Economy (Share of National Totals).

	Population	Total land	Agricultural land	Income	Density of population
1960	11.8 %	2.7 %	15.3 %	11.7 %	81 ¹⁾
1975	12.3 %	2.7 %	16.7 %	12.1 %	93 ¹⁾
1980	12.3 %	2.7 %	16.7 %	12.2 %	93 ¹⁾

1) Inhabitants per square kilometer

Source: Statistisk Årsbok 1962, 1976 and 1980.

See also Andersson-Hjorth-de Maré-Thelander 1979.

The country as a whole has a population density of 20 inhabitants per square kilometer. The Skåne region is relatively densely populated. This means that the environmental problems are important in the planning of land- and water use. Conflicts on the use of other natural resources are also serious in this area. The growth of population density associated with the high productivity of the area has walked hand-in-hand with an increasing relative importance of Skåne in agriculture production and policies. So even if Sweden is a country with lots of land- and water resources, at least the southern parts is short of land or water resources for different activities. The Skåne region is in some respects short of both.

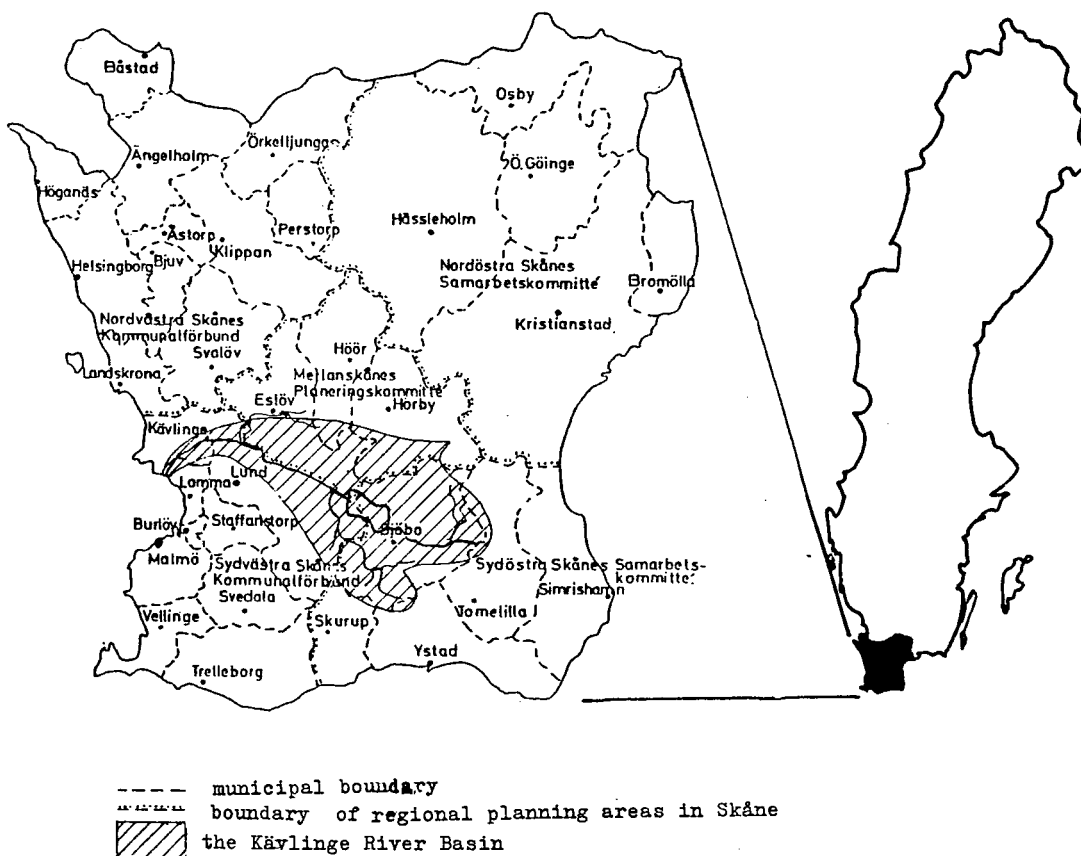


Figure 1. Sweden and Skåne, with the Kävlinge River Basin with the Lake Vomb

Swedish manufacturing is specialized on machinery and other engineering products, paper, pulp and other forestry products and steel. Table 2 shows that the western part of Skåne (Malmöhus county) has a completely different industrial profile. In Western Skåne manufacturing is specialized in food and beverages, chemicals, rubber and nonmetallic mineral products (mainly building products). The dominance of food and beverages is related to the large scale of agricultural production located in Southern Sweden. This statistic indicates that the region is rather specific on questions relating to the growth of production pollution and water demand from the food and agriculture complex, the chemical and rubber industry, the nonmetallic mineral product industry and from the municipalities in order to supply the inhabitants with drinking water and areas for recreational activities.

Table 2. Percentage Share of National Manufacturing Value Located to Malmöhus County, Western Skåne

	1968-1970	1973-1975
Food and Beverages	21.4	20.8
Chemicals, rubber etc	18.6	18.3
Nonmetallic mineral products	14.1	15.3
Textiles, Apparel	9.2	8.7
Paper, Pulps, Printing	9.0	8.0
Fabricated Metal Products, Machinery etc.	7.1	7.3
Basic Metal Industries	3.2	2.9
Wood and Wood Products	1.9	1.6
Other Manufacturing	6.4	4.5
Manufacturing	9.5	9.1

Source: Andersson-Hjorth-de Maré-Thelander 1979.

2. Land and water resource conflicts

The land use in Western Skåne is at the moment highly exploited for agriculture and expanding urban areas, mainly near the coast. The Kävlinge river basin is, with a few small exceptions, an area which is made full use of for water supply to urban areas, industries and a rapidly growing irrigation in agriculture. The river is as well used as a receiver for waste water. Both activities affect the water situation in the river quantitatively and qualitatively. The land in the river basin is almost everywhere of very good quality and attractive for agriculture. There is also a great pressure from municipalities, the County Administrative Board and the public to use the river basin for recreational activities.

The water conflict is a typical up stream - down stream conflict. The water shortage areas are the heavily industrialized and densely populated Malmö-Lund region at the coast and the inland water is the resource area. (See fig. 2).

The jurisdictions for the river basin is divided on seven local governments. Each local government (municipality) is autonomous concerning the land use. On the other hand the water use is juridically regulated in water courts. This difference in decision ability is a source for conflicts. The demand and supply of water for municipal and industrial purposes is therefore based on intermunicipal agreements. In table 3 the characteristics of the seven local governments are illustrated.

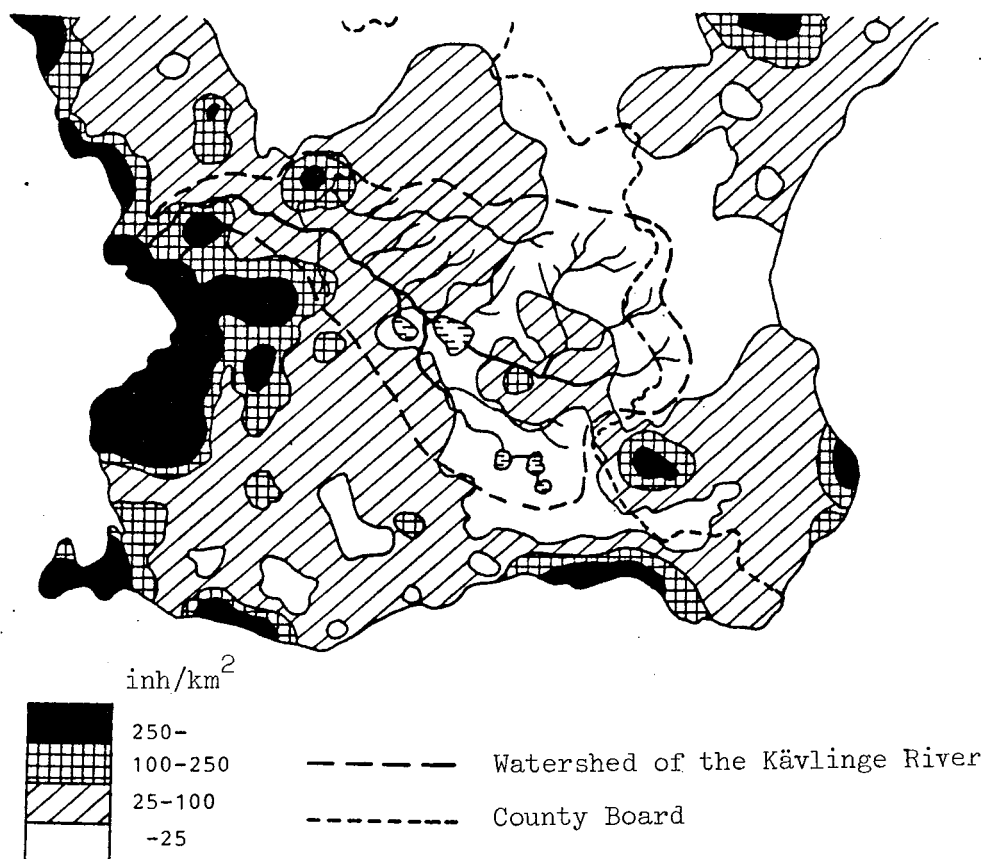


Figure 2. Population density in Southern Skåne on the water resources area in the Kävlinge River basin with Lake Vomb (Castensson 1980).

Table 3. Characteristics of the local governments in Kävlinge river basin 1979

Local government municipality	Area km ²	Population	Inh/km ²	Urbanization percentage
Lomma	56.1	16,621	300	91
Kävlinge	154.7	20,183	131	79
Lund	442.7	77,550	180	92
Eslöv	425.6	26,932	64	74
Hörby	434.2	12,461	30	45
Sjöbo	509.9	14,666	30	48
Tomelilla	396.7	12,597	32	53
Total	2419.9	181,010	74	72

Source: Year-book for municipalities in Sweden 1979

If you compare the map in figure 2 outlining the water demand areas with the map in figure 3 showing the autonomous local government areas there is a discrepancy between the decision making power of the demand municipalities near the coast and the inland resource municipalities. Until today water transfer systems have bridged the gap. But nowadays there are discussions about

- the long-term effects of water transfer from the Kävlinge river basin
- the distribution of the water resources between urban and rural users
- the payment for supplementary long distant water transfer system

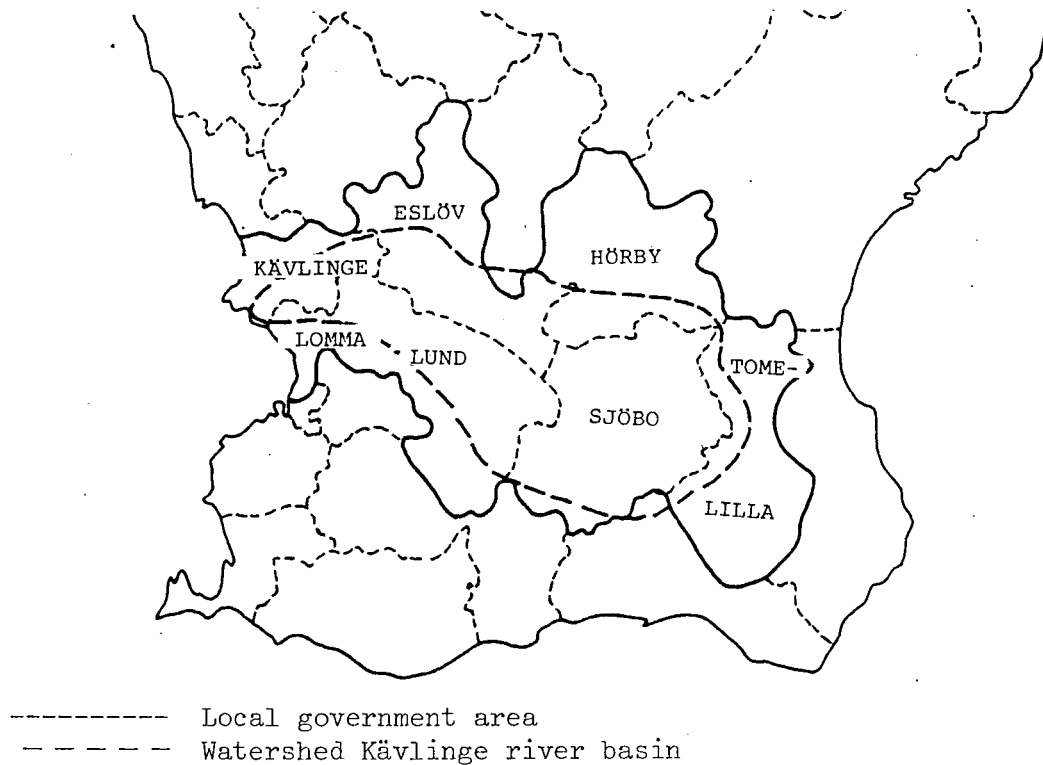


Figure 3. Local government areas and the Kävlinge river basin

The water conflict situations for land and water use in the region is focused around the Vomb-lake, in the middle of the Kävlinge river basin. At the moment we can identify fifteen different agents with different demands on land and water use around the lake (table 4, figure 1). Our tasks as social scientists in the research project are

- to outline a social theory to understand the relations between planners with different demands
- to identify all agents with demands on water and land use in the area
- to outline models where all agents can act in a common planning process
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Table 4. Agents and their Demands on Land and Water Use in the Vomb area

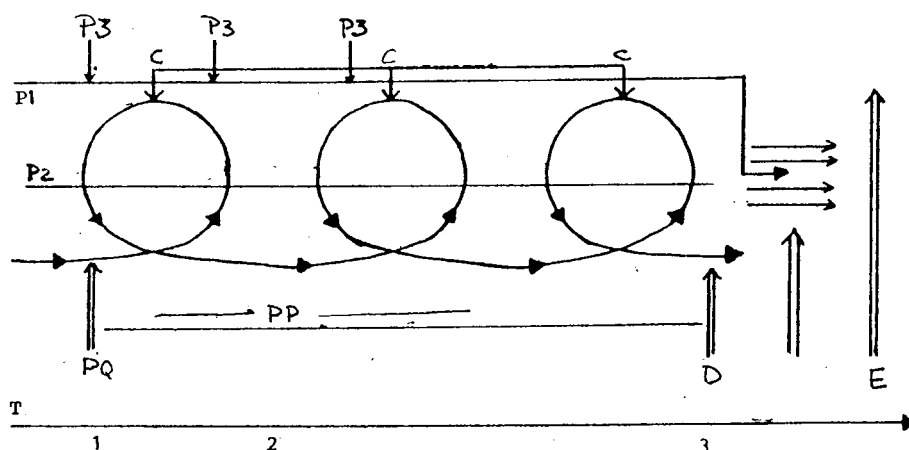
Agent	Demands on land and water use
Sjöbo (municipality)	Water quantity and quality for open air water sports
Hörby (- " -)	Land use for agriculture, recreation
Lund (- " -)	- " - , - " -
Eslöv (- " -)	- " - , - " -
Malmö 1 (- " -)	Water supply for urban areas
Malmö 2 (- " -)	Recreational area: boat sport, sportfishing
The County Administrative Board	Recreational area: all kinds of open air life
Fishing	Water quantity/quality for fish reproduction
Agriculture	Water for irrigation
Sport fishing	Water quantity and land facilities for sport-fishing
Boat sports	Water quantity during the season
People living around the lake	Beautiful landscape and surroundings
People owning summer houses	Water quality/quantity for recreation activities
Open-air-life in the region	- " -
Organizations for conservation of wet land and bird reproduction	Water quantity and undisturbed areas for bird reproduction

Source: Castensson-Thelander 1981

3. Conflict dynamics in a planning process

An outline to a dynamic planning theory for situations with many agents is illustrated in graphic form in figure 4. When a planning question is raised you have to decide if it is important enough to go further and define it as a planning problem.

If so is done the planners must have discussions continually with all agents which have demands on land and water use in the area. The agents in the planning process are all representatives, either politicians, organizational members or just ordinary people, of the fifteen agents presented in table 4. To reach a good decision economy we include all of them in the planning process, and can probably escape severe demonstrations and actions later in the process. According to the width of the planning problem the public is involved more or less in the planning process (figure 4). To be able to indicate time periods with great conflicts in the future for the Vomb area and to identify the agents



- P₁ = Politicians
- P₂ = Professional Planners; administrators and experts
- P₃ = The public
- PQ = A planning question or activity is actualized
- PP = Planning problems in the process
- C = Time periods for strategic choice
- D = A final decision
- E = Evaluation period which creates new planning problems for the future
- T = Time

Source: Castensson-Thelander 1980 and 1981

Figure 4. An Outline to a Dynamic Planning Theory

and their demands on land and water use we need a historical approach. The historical analysis is made out of statistical data, interviews and the judgments of the water court during a period from the early 1930:s until today.

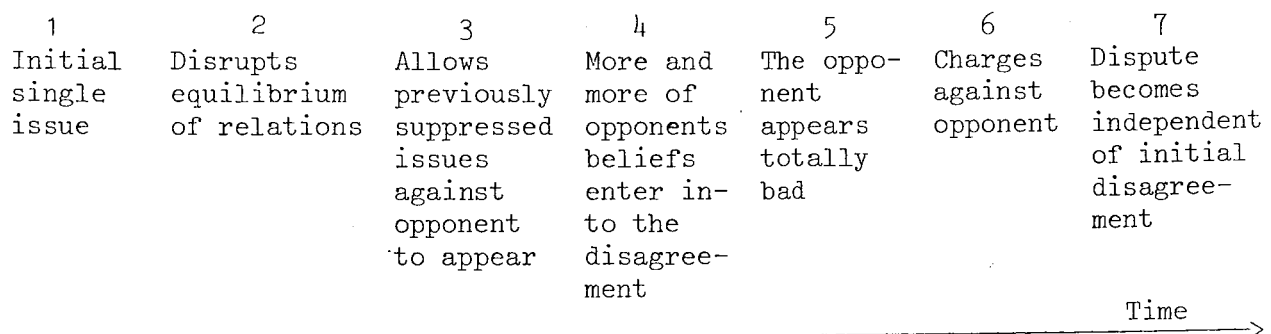
Public Participation as	The Width of the Planning Problem: Description of the Planning Problem	Economization with Land and Water Resources	Allocation of Limited Resources
Information Participation	x	x	x
- indirectly	x	x	x
- personal		x	x
Member in decision-process			x

Source: Thelander 1980

Figure 5. The Relation Between the Width of the Planning Process and the Level of Activity in Public Participation

4. The Dynamics of Social Conflicts

The issues which provide the initial problem undergo great transformations as a controversy develops. The initial problem in the Vomb area was to supply the population of the city Malmö with drinking water. During the planning process the original problem has grown from a very specific one to a lot of problems concerning the general questions about land and water use indicated in table 4. During the process new and different issues have been actualized and some of them have been included in the planning process, e.g. problems concerning fishing in the lake Vomb (figure 7). On the other hand problems disappeared. There have been debates on recreational activities in the area, and problems concerning land and water use. In some cases new organizations have been founded in order to take care of different aspects of the natural resources. It is a general trait in social conflicts that such a situation goes to a definitive confrontation (figure 6) where different views on the problems leads to antagonism.



Source: Castensson-Thelander 1981

Figure 6. Phases in the Development of a Controversy

In the dynamic conflict situation we include every identified agent in this phase of the planning process. The power of the agents in facing and solving the problem differs according to

- their knowledge
- degree of influence on the planning problem
- their economic interests in the planning area
- their strength; e.g. number of supporters/members in the organisation, population

The unifying link between the agents is their aggression to the use of the planning area. The discussion between the agents creates a situation where some of them cooperates in coalitions. The general hypothesis for coalition formation in this situation is that each of the members in the coalition can increase his power. The knowledge of the planning problem grows, or the strength grows or the capacity to influence the solution of the problem grows through the coalition. The process ends in a decision process where the divergences between the many agents have been clustered around three variables, namely local living, economic interests and regional interests. In the decision situation the former fifteen actors have been reduced to three coalitions, and everyone is in some way or other included in the process.

To be able to use this model in practical planning we do some further research concerning methods for public participation and methods for indicating future conflict situations.

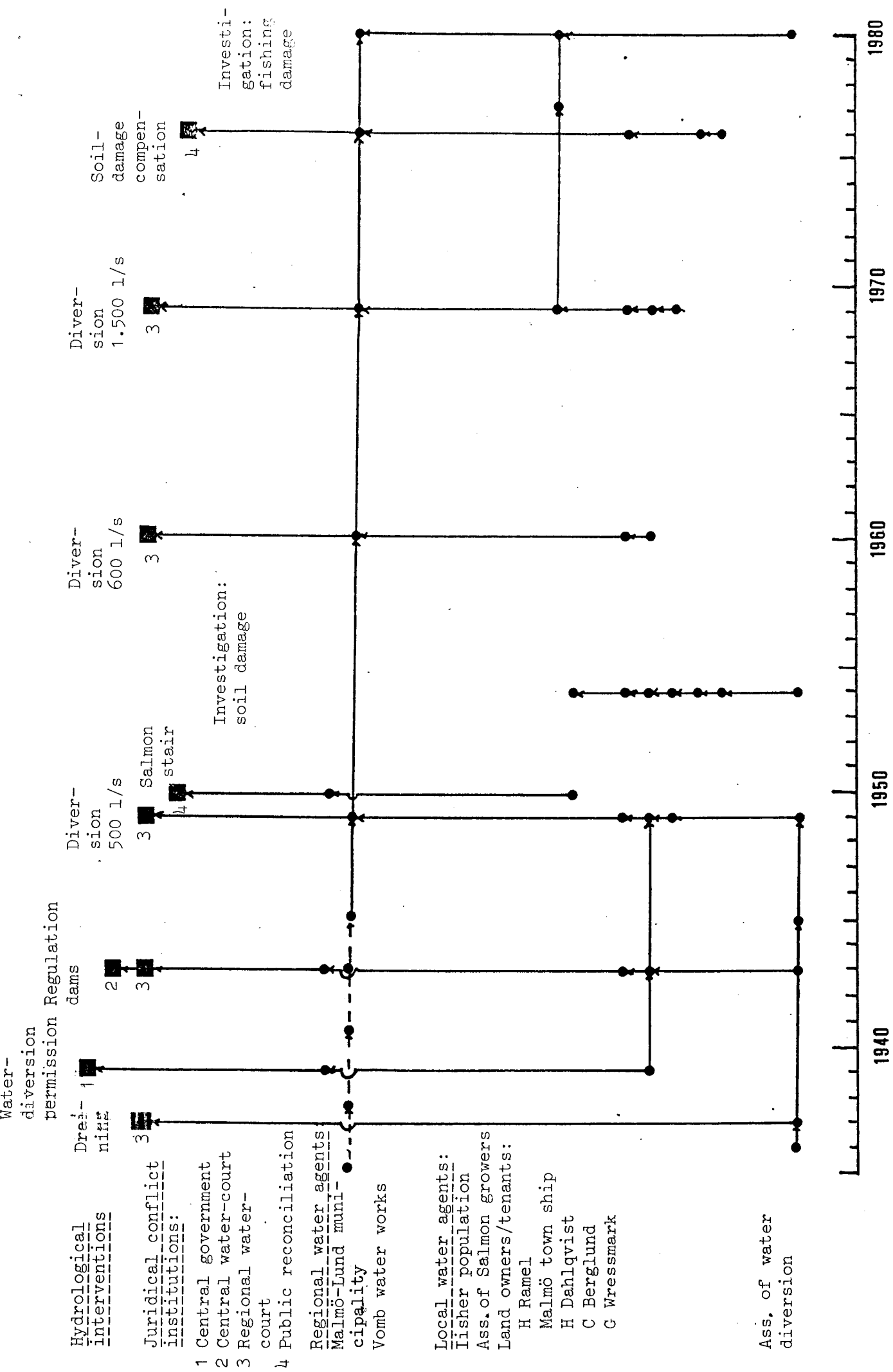
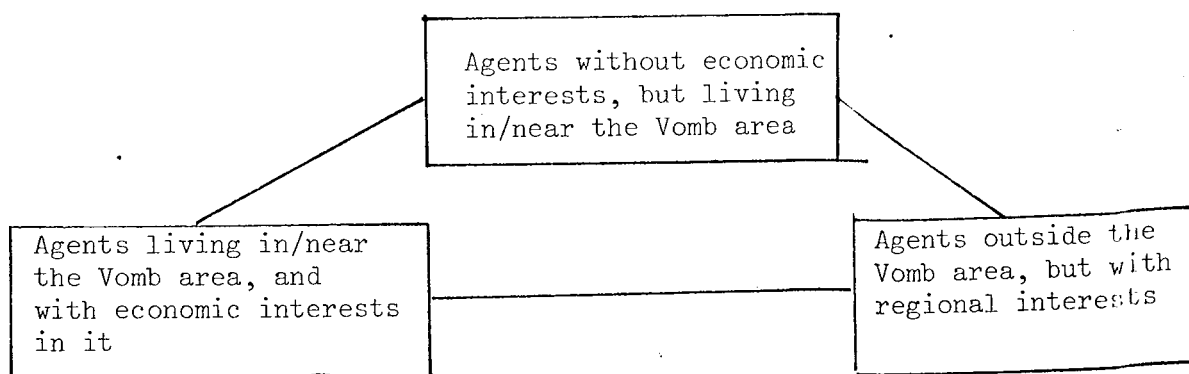


Figure 7. The Water Actors Identified from the Juridical Water Planning Process 1935-1980 (Castensson-Thelander 1981)



Source: Castensson-Thelander 1981

Figure 8. Coalition variables in triad relations

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