The missing link(s)
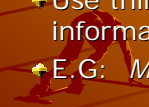
Matrices and causal flow diagrams for sorting information
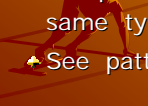

Convergent thinking for the rational analysis stage

- Find patterns, relationships and order in the information/data surfaced
- Use thinking tools for organizing information
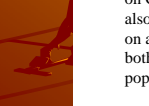- E.G: *Matrices, Causal Flow Diagrams*

The Matrix

- Separate elements of a problem
- Categorize information by type
- Compare types of information
- Compare pieces of information of the same type
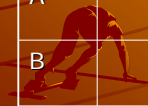- See patterns among the information

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Pink rail

The Giant Pink Rail

3 pops of the species are distributed through an island chain. Human populations have established on islands A and C. Strangely only the population on C utilises pigs which free range. Pigs were also introduced to island B but rats have ended up on all 3. Only the rail population on A is stable both of the others are declining. Why is the rail population declining on B and C?

USING A MATRIX

	Rail POP STABILITY	PIGS	HUMANS	RATS
A	+	-	+	+
B	-	+	-	+
C	-	+	+	+

Causal Flow Diagramming

- Identify major factors
- Identify cause and effect relationships
- Are relationships direct or inverse?
- Diagram relationships
- Analyze relationships as integrated system
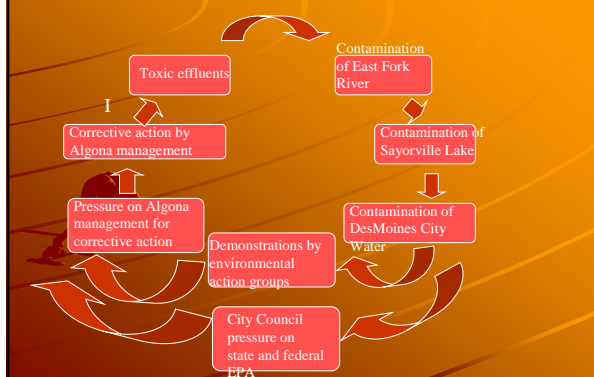
Algoma Pollution

The Environmental Protection Agency (EPA) has discovered volatile organic compounds in effluents from a processing plant of the Algona Fertilizer Company in Algona, Iowa. These toxic waste products bypass the city of Algoma, but are carried into the East Fork Des Moines River, a tributary that feeds into Saylorville Lake, the principle water source for Des Moines, a city of more than 300,000 people. The Des Moines city council, through news media and political channels, is putting enormous pressure on state and federal environmental agencies to shut down the Algona plant. Environmental action groups, with full media coverage, demonstrated yesterday in front of the Iowa governor's mansion demanding immediate closure of the plant. Local TV news and talk shows are beginning to focus on the issue. The company's executive board has convened an emergency working group to consider what the company should do.
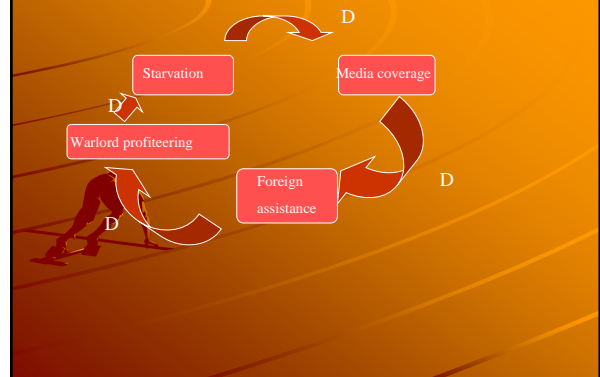
What is the "problem"? (write it down)

Create a causal flow diagram interrelating all the elements

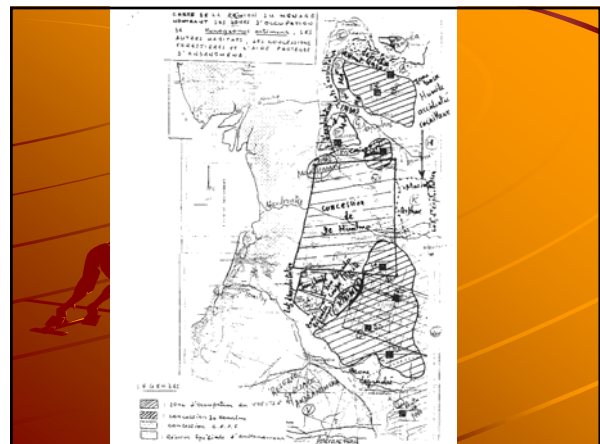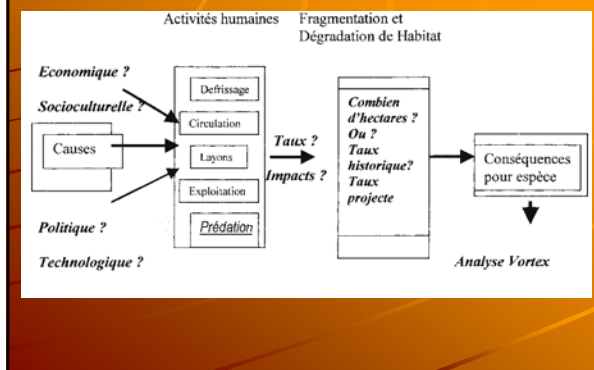|		
Toxic effluents	D	Contamination of East Fork River
Contamination of E.F. River	D	Contamination of Saylorville Lake
Contamination of S. Lake	D	Contamination of D.M. city water
Contamination of city water	D	City Council pressures EPA
Contamination of city water	D	Demonstrations enviro groups
City pressure on EPA	D	Pressure on Algona for action
Demonstrations by enviro groups	D	Pressure on Algona for action
Pressure on Algona for action	D	Corrective action by Algona Mgmt.
Corrective action by Algona Mgmt	I	Toxic effluents

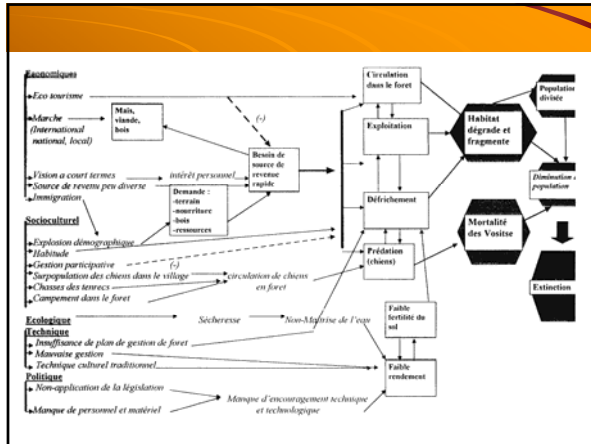## Causal Flow Diagram

Out of control!

Jumping rat example

Your exercise

- When you have enough information, generate either a matrix or a causal flow diagram or both in order to *converge* (gain a sense of the pattern, system interconnections and discover causalities).