Figure 2: Concept Map for an Ill-Structured Problem

4.2 STUDENT WORK

Student groups were asked to save their work in a unique file after each lesson. These were analysed to understand which resources were collected and how those resources were utilised to support the students' final argument. Students with the structured task tended to focus on the radio, television and newspaper information resources while students with the ill-structured task were more likely to collect all the resources on their problem. Often this included irrelevant information about plant and animal life which related to the geographical area of the river being investigated but did not relate to the problem to be solved. Students with the structured task tended to manipulate the information collected at a very early stage in the learning activity (within the first three lessons) while the complete raw information resources appear in the files of the students with the ill-structured task until the last lessons of the learning activity. The final report was marked by an experienced teacher, who evaluated them in terms of quality of argument, overall quality of their answer, use of inferences and use of concrete supporting details. The marker found that overall, students who attempted the structured task produced higher quality work in terms of related resources and solutions to the problem. This has lent further support for cognitive tools to support problem analysis and argumentation.

4.3 STUDENT INTERVIEWS

Each pair of students was interviewed about their use of *Exploring the Nardoo*. In response to the question: "Did you find it difficult to solve the problem?" none of the groups, with the structured task, found it difficult to solve the problem. Most mentioned that all the information made it easy to solve the problem. One group with the ill-structured task identified in their concept map a number of issues rather than one specific problem, and mentioned that there were "lots of small problems but not one problem to solve".