This research work focusses on the feasibility of using expert system to make
diagnosis of tank irrigated systems.

First a thorough study of the concept of diagnosis, of the specificities of expert
systems, and of the situation of tank irrigated systems in Tamilnadu was carried out. In order to
build an expert system prototype a three step methodology was used:
-First, was adopted a process of knowledge acquisition through interviews of experts working
mostly in South India and walk-in studies of real case diagnosis (both in South India and out of
India ) with a backthought of testing the potential for generalising such a tool.
-Second, was selected a shell working on PC AT, an initial limited prototype implemented and
parts of the reasoning process were transcribed in this expert system shell.
-Validation and generalisation were attempted; they have been highly hindered because of the
nature of expertise that was collected and because of the computer limits faced with the expert
software.

The diagnosis process is not based on constant decision rules that pre-exist in the mind of the
experts whenever they start a diagnostic process. In fact, in the course of a first learning phase,
they create the rules and knowledge required for the diagnosis process and then apply it in a
second phase; this second phase is quite often interwoven with the first phase. The learning
process makes use of the experience of experts as well as of their understanding of what are the
present objectives, framework and particularities of the site under study.

The diagnosis is usually multidisciplinary in character. Each elementary diagnosis
incorporates the conclusions obtained by the others in one's own reasoning process. The
method used overcomes the inconsistencies between the various experts by adopting a
'master logic' that enforces its ways on the individual experts. Such a process is very much
subjective and flexible; and the 'political rules' used to chain the diagnosis are not permanent.

This makes the transcription to expert system quite tough, because there is no
apparent general logic and therefore only parts of the diagnostic process could be transcribed.
This does not lessen the potential for applications of expert systems in the field of irrigation;
They can be profitably developed on problems which are clearly defined and for which the
knowledge exists in such a matured shape that it will enable a complete transcription to expert
system. For the other problems it points out the areas where the knowledge and reasoning
process are still intuitive or fuzzy, thus defining new areas of research.