7.1 Summary and conclusions:

The balanced growth of different regions is a major instrument for improving the quality of life of the underprivileged people. Many approaches have been adopted to bring about a sustained growth in the rural areas. Some have emphasised agricultural development with food security while others have stressed land reforms and agrarian relationships while yet others on creation of an effective rural (physical, social, economic) infrastructure. However, these approaches have not resulted in the desired effects in removing unemployment and poverty in the rural areas. In many cases the programmes have benefitted the relatively better-off farmers, thereby creating more social tensions. There is a need to review the existing strategies and suggest an alternative planning framework for designing an effective strategy for long term development of the local areas.

The adoption of an area-approach to planning is essential to ameliorate the growing inter and intra-regional disparities in development. Local knowledge specific to the problems is very important for management of the natural resources with the active participation of the local inhabitants. This is possible if the planning unit is decentralised to a smaller area level, say, a district.
At present, there are serious data gaps in respect of available natural resources, social overheads and development potential in a district. Without such an authentic database the local participation may lead to conflicts and biases thereby losing sight of the main objective. Upgrading the resource database at the local levels is therefore needed. The use of new technologies (computers and remote sensing) may be essential towards designing a self sustainable local area management and planning system.

The past experiences of micro level planning in India has only a marginal success due to the following reasons:

* poor formulation of the plan
* plan not integrated with other programmes
* lack of budgetary provisions for the local level
* improper implementation
* limited local participation.

In view of the above it was felt that the applications of Operational Research and Management Science models along with a computerised database system will help in making the planning process scientific and more participative. A concerted effort in developing a methodology for decentralised planning for local areas and creating decision making aids through management science models is attempted in this study.

Having discussed the problem, methodology and the organisation of the thesis in Chapter 1, the study reviews the existing literature on regional planning and development in Chapter 2.
Growth centre theory, concentration of industries and various other theories were reviewed. It was found that there is need for a theory to explain the process of regional development.

The study then considers some country studies on specific developing countries like China, Nigeria and Brazil in addition to empirical evidence from India on development of backward regions. One general conclusion that was derived from these studies is that industrialisation per se do not necessarily solve the problems of backward areas and therefore an alternative strategy for development is needed. The thesis then develops a broad framework for designing such a strategy in chapter 4.

A 3-phase strategy with approximate duration of 5 years for each phase is suggested. The following are the components of the alternative development strategy:

(i) Increasing the bio-mass and agricultural production.

(ii) Small scale energy and chemical production using bio-conversion processes.

(iii) Development of physical infrastructure.

(iv) Efficient production and local distribution of energy.

(v) Dispersed industrialisation.

(vi) Exploitation of renewable source of energy wherever possible.

(vii) Development of health, education, drinking water and other facilities.
The broad framework as delineated in Chapter 4 is then translated into specific action programmes for the development of the backward districts of Bankura and Purulia in West Bengal. This is presented in Chapter 5. The purpose was to demonstrate the utility of the alternative strategy. Further, a study was conducted to prepare a detailed plan for the development of a backward local area, Teghari Gram Panchayat in Chhatna block of Bankura district. The details are not presented here, however, a table shows the potential activities that can be generated and investment required in the region for 100% employment of the local population.

Various Decision Support Systems (DSS) were developed to help the decision making processes at the regional level. Some of these DSS models on energy planning, facility location, watershed management and other infrastructural planning are briefly presented in Chapter 6. These models will support decentralised planning decision making at the regional level. The potential role of these models are demonstrated with data from some blocks from the Bankura and Purulia districts.

Finally, Chapter 7 summarises the findings and lists the research efforts needed in the future.

7.2 Future research directions:

The study has provided a broad outline for an alternative strategy for the development of the backward regions. Although, the case studies on Bankura and Purulia districts demonstrates
the potential for applications of management science principles
for decentralised planning decision making, there is a need for
future research to sharpen the model structure and the process of
decision making at the local areas. Some of the future research
that are needed in this regard are listed as follows:

a) There is a need to conduct specific research studies to
understand the 'spread' and 'backwash' phenomenon. The
spatial spread of a specific size, class and type of an
economic activity on its geographical space remains an
interesting and useful research study.

b) In view of the opening up of many developing countries and
the availability of new and environment friendly
technologies, there is a need for conducting more in-depth
studies on the 'strategy for industrialisation' for
sustainable development of the regions. The strategy must
consider the linkages between agriculture and non-
aricultural sectors in a systemic way.

c) There is need for conducting studies on the effects of modern
technologies on employment. Many developing countries are
adopting the latest technologies for the industries and at
the same time promising generation of more employment
opportunities. However, there is no knowledge whether those
objectives are contradictory or not. Specific case studies on
effects of modernization on employment may be a worthwhile
research proposition. The effects of investment on
environment and employment must be the focus of these
studies.

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d) The DSS models developed here shows prima-facie usefulness of the models in area planning. The development and adoption of similar models for decentralised planning decisions may open up new possibilities.

e) Many of the developing countries have specific problems in terms of infrastructural inadequacy and managerial inefficiency. The strategy must consider the specific socio-economic and cultural (tradition) aspects while suggesting technology adoption and upgrade for specific country and regional environment.

f) Further, it was found that though the problems of local area development is complex and have systemic inter-relationships, the planning and implementing authorities do not have special organisational structures to tackle these complexities. There is need for designing an effective organisational structure for management of decentralised planning decision making.

g) Finally, the thesis provides a case for development of a spatial plan for action (with micro-level detailed action programme) for one region. If such a plan is formulated and implemented in one region (district) to show the results and achieve the sustainable development of the area, it may usher in a new era of management decision making for decentralised planning decisions and backward area development.