established to fill Quebec's needs for improved seed; research is continuing, particularly on the genetic improvement of softwoods and hardwoods and on the maintenance of plantations.

In Ontario, 10 nurseries, operated by the Ministry of Natural Resources, produced about 70 million bare root seedlings and 9 million container seedlings in 1986. Private contractors, hired by the Ministry, produced about 70 million container seedlings.

In Manitoba, a tree improvement program ensures seedlings are of the highest quality. About 12 million seedlings are planted annually in reforestation of Crown lands. Forest improvement by thinning, cleaning and chemical spraying removes undesirable species and encourages growth of preferred trees.

The Alberta government has allocated $6.2 million per year, under a public lands development program, to clean and tend, and help secure forest regeneration in the province. An effort is also under way to improve the quality of regenerated forests in Alberta. Test plantations of white spruce seedlings have been established, using optimum conditions on a range of different site types, and monitoring is producing interesting results. Alberta is evaluating the cost effective expansion of the productive forest land base, through drainage of existing under-productive peatland forest. This has become necessary because of withdrawals from the productive forest land base for other uses, including oil and gas, and agriculture.

Saskatchewan's four forest nurseries produce about 12 million seedlings a year for government and industry planting projects on forest land. The forest nurseries have three new facilities — two major pumphouses and one seedling processing/storage building.

Silviculture program spending in British Columbia amounts to nearly 50% of the provincial government's total forestry budget. The annual rate of reforestation is nearing 240 million seedlings. The new goal is to restock 75% of forest lands cleared annually, leaving 25% for natural regeneration.

8.1.4 Overview of the forest industries

Canada's forest area, estimated at about 436 million hectares, provides the basis for an extensive forest products industry. The industry includes establishments engaged in the harvesting and further processing of wood and plays a major role in Canada's economic activity. Related employment in 1986 exceeded 277,000 persons and accounted for about 12% of the total employment in the goods-producing industries. Total shipments exceeded $38 billion and the net foreign trade surplus, at $15.7 billion, contributed significantly to Canada's positive merchandise trade balance in 1986.

The 1980 Standard Industrial Classification (SIC) divides the industry into three broad sectors: logging; lumber and wood products; and pulp and paper products.

Logging. Canada's forests include a wide variety of species, ranging from mixed hardwoods and conifers in the East to predominately coniferous forests in the West. In total, softwoods account for about 92% of the annual cut, with spruce the most important species.

Although logging activity is found in all parts of Canada, operations are concentrated in British Columbia, Quebec and Ontario. British Columbia occupies the dominant position, accounting for about 45% of the annual production of the logging industry.

Table 8.5 shows the volume of wood cut during the 1981-86 period. Output in 1986 exceeded 177 million m^3, an increase of 5% over 1985 and 22% over 1981.

The overall cyclical trends that affected the Canadian economy during the 1980s are evident in the logging industry. Production began to decline in 1981 and reached a low point of 127 million m^3 in 1982. Commencing in 1983, the industry entered a period of continuous growth and by 1986 production was 39% above the 1982 level.

Similar trends occurred in the employment data — a high point in 1981, followed by a sharp decline in 1982, with a new cycle commencing in 1983. Changes in employment in the post-1982 period have been smaller than the changes in output, reflecting improvements in operating procedures.

Wood and paper industries. This group includes those industries engaged in the production of a full range of products, from basic lumber, plywood and paper to completely manufactured goods such as pre-fabricated buildings and kitchen cabinets.

Table 8.6 shows the structure of the group and, based on Census value added, its contribution to Canadian manufacturing activity.

Differences in tree types, geography and climate have influenced the development of the industry. Sawmill activity is concentrated in British Columbia while pulp and paper activity is concentrated in Quebec. Ontario ranks third in both sawmill and pulp and paper activity (Table 8.7).

The overall trends established by the group in the 1980s resemble those for the entire manufacturing sector — relatively high levels of output in 1981, a sharp decline in 1982, and a recovery cycle in the post-1982 period.