

CHAPTER 13

Economic Projections

The Okanagan Basin Agreement specifies that the comprehensive framework plan for water resource development and management should encompass the 50 year period to 2020. Consequently it was necessary to develop projections of economic activity and population growth for this planning horizon in order that the capability of the water resource to supply future consumptive and non-consumptive water requirements and to assimilate future waste loadings could be assessed. It is worth emphasizing that these projections were undertaken to provide an information base for forecasting demands for the Okanagan water resource and not to develop regional economic plans for the Okanagan basin. Consequently they lack much of the detail that would be required for the latter purpose.

As stated in Chapter 12, because of the uncertainty in predicting future economic development in a small region such as the Okanagan, the Consultative Board decided that a range of projections of future growth should be prepared, based on three different assumptions. This approach had several advantages over the development of a single projection. First, the projections allowed varying emphasis to be placed on the three major factors which affect lifestyle of the Okanagan resident - economic growth, environmental quality and social betterment - and thus enabling a broad array of criteria associated with the major goals of the study to be implicitly considered in developing a framework plan. Second, it permitted a wide range of future demands for water and related resource use to be prepared so that the capability of the water resource to satisfy demands could be more rigorously assessed. Third, it provided Okanagan residents with an opportunity to consider a range of possible conditions of future economic growth in the valley, and to assess the social and economic consequences of the future growth options available to them.

It was recognized that the Okanagan economy had gained a certain momentum as a result of the Federal Government's economic expansion program during the late 1960's, and it was considered this momentum would continue to at least 1980. Therefore the trends associated with the low and high economic growth projections are not expected to affect current growth patterns until 1980 and afterwards. This statement should not be construed to mean that nothing should be done until 1980 to change economic growth patterns in the Okanagan, but rather that it requires five to ten years for any policy changes to make a marked impact on an economy.

The economic growth projections were prepared both for the entire valley using an economic input-output economic model, and for selected tributaries, based on land capability analysis. The valley-wide projections were developed through an analysis of the internal and external economic pressures that create growth in the Okanagan and are essentially demand-oriented projections. The capability of water, land and other resources required to sustain this economic growth was not considered a constraint in the first stage of developing these projections. In the second stage, both land and water resource requirements were assessed and incorporated into the projections. When predicting population growth in tributary basins however, capabilities of land, water and other resources were taken into account in the first stage since these can be important limiting factors on economic development in small areas. Because tributary basins are too small to be considered as viable economic regions, a wide range of population and irrigated acreage projections based on land capability analysis, were prepared for each of eight major basins as a separate part of the economic growth studies.

This chapter presents a summary of the assumptions and methods used to develop economic growth projections for the entire valley. As growth projections in tributary basins were closely tied to tributary water quantity studies, these projections are described in Chapter 14. Growth patterns of population, employment, agriculture and tourism are compared for each valley wide projection and some of the economic and social consequences of these patterns are described. A more detailed discussion of the methods used to develop the economic model of the Okanagan and an analysis of the facts and figures associated with each projection are contained in Technical Supplement X.

Although a considerable amount of economic data for the Okanagan region was available from both Federal and Provincial government agencies, much of the information used to prepare the growth projections was obtained from studies carried out under the Okanagan Basin Agreement. During 1971-72 a detailed questionnaire survey of a sample of business firms in all sectors of the Okanagan economy was undertaken to obtain an understanding of the economic linkages between sectors within the Okanagan economy and with economic regions outside the Okanagan. The data obtained in these surveys were used to construct an economic input-output model of the present Okanagan economy. This model made possible the assessment of the impacts of projected growth in each economic sector on all related sectors, so that complete economic projections could be developed. The sampling methods used in the economic survey and the quality of the data base are more fully discussed in Technical Supplement X.

13.1 ECONOMIC GROWTH PROJECTIONS

Three economic growth projections for the Okanagan were prepared by varying the emphasis on the economic and environmental goals associated with the Study. Specifically, the following assumptions were used to generate the different projections:

Projection I

Continuation of existing economic policies in the Okanagan. The high rate of economic growth experienced in the valley over the past 10 years was assumed to continue to 1980 and then gradually decline over the next 40 years to 2020. In accordance with present provincial government policy, agricultural lands will be protected from sub-division for residential and industrial purposes, although some limited transfers in the form of land banks can be anticipated.

Projection II

An increase in the rate of economic growth compared to Projection I stimulated by the assumption of further government support for industrial development. Land use policy is similar to that assumed in Projection I, except that greater rates of population and industrial growth will result in increased transfers in land use from agriculture to residential and industrial development.

Projection III

A decrease in the rate of economic growth compared with Projection I through controls on industrial development. These controls would apply to any economic activity creating employment through the export of goods and services to regions outside the Okanagan. Thus, after 1980 the valley will grow only in response to internal demands from increasing population rather than expansion of the economic base to support growth outside the basin. As the main emphasis in this projection was on maintaining a high level of environmental quality, agricultural lands were assumed to be protected from subdivision and additional agricultural development encouraged.

Methods for developing these three projections were broadly similar. It was mentioned in Chapter 3 that the Okanagan economy grows because areas outside the basin demand goods and services such as agricultural and forest resources, as well as non-resource based manufactured products which are processed in the valley. These industries in turn demand a wide range of locally supplied goods and services for their production processes as well as to service their employees and dependents. As the export-oriented industries grow, so do the local economic sectors that service them. Consequently, the Okanagan economy consists of a large number of closely related and mutually dependent economic sectors. Direct demands for goods and services in one sector of the economy create indirect demands for goods and services in related sectors. For example, increased production of tree fruits (agricultural sector) creates demands for packing cartons (manufacturing sector) which in turn increases demands for pulpwood (logging sector). Furthermore, employees of the industries that create and meet these demands, also require a wide range of services - education, health care, financing, retail (shopping) and construction (housing) - which

comprise the major sector of the economy.

An economic (mathematical) model was constructed to trace these inter-sector linkages. This model is known as an input-output model because it describes the inputs and outputs associated with each of 30 major sectors of the Okanagan economy. Through an understanding of the economic linkages within the region, the model can determine total demands for the output of each of these sectors in 1970. Total demands comprise direct demands due to self-generated growth as well as indirect demands due to growth in related sectors of the economy.

Economic growth projections were made for the years 1980, 2000 and 2020. For each of the prescribed years, direct demands for outputs in each of the 30 sectors were estimated using the best economic forecasts available. Additional indirect demands associated with each sector were then determined by tracing the impacts of these direct demands on related sectors by means of the inter-industry economic model. The outputs of the model were specified in constant 1970 dollars of total (direct plus indirect) demands, which could be translated into production units (pounds of tree fruits, number of trailers), An estimate of the total labour force was made by using productivity statistics related to production units per employee, and also taking into account trends in these statistics over time.

Many assumptions had to be used in the development of these economic projections. The most significant one involved changes in labour productivity in each sector and changes in the economic linkages between sectors. Obviously, the relative accuracy of these assumptions decreases rapidly as the length of the planning horizon increases and it should be noted that the economic projections developed can only be assumed to be relatively accurate to the year 1980. Rapidly changing patterns in working hours, leisure demands, industrial and transportation technology can be expected over the next 50 years making projections of economic growth, especially in small regions such as the Okanagan Basin, little more than educated guesses. It can only be hoped that the range of demands for water and related resources associated with these projections encompass the likely resource requirements which will in fact be needed in the future.

13.1.1 Projection I - Continuation of Present Economic Policies

Forecast population growth in the Okanagan for Projection I was based upon population projections for the Province as a whole, prepared by the Provincial Government. Up to 1980, the economic momentum generated in the latter part of the 1960's was expected to enable the Okanagan to grow at somewhat faster pace than the Province in general. After 1980, the Okanagan economy should be well

diversified and the region may be expected to grow at Provincial rates. Population totals were distributed into the four economic sub-regions according to recent growth trends, but were adjusted as necessary to account for land capability, transportation routes and other factors.

Forecasts of direct demands in manufacturing and tourist-recreation service sectors of the Okanagan economy were developed. These projections were based to some extent on past trends, particularly since the Federal governments' Industrial Incentive Program was introduced in the mid-1960's, but also took into account potential growth opportunities in the non-resource based manufacturing sector which sells to markets outside the basin. In the mining and logging sectors, limited resource potential will likely act as a constraint, so that maximum levels of economic growth will be attained within the 50 year planning horizon. Projections of employment were obtained from forecasts of labour productivity applied to the output of each economic sector as calculated by the input-output computer model.

Projections of demands for agricultural products were more difficult to assess because of non-economic factors that affect the development of this sector. Provincial government legislation does not allow the transfer of designated agricultural land to non-agricultural purposes except with approval from the Cabinet. Under this policy, small declines of tree fruit acreage around the larger urban areas are forecast. However increased production per acre is expected to more than overcome this loss of acreage, and increased production could be absorbed by continued supply of Western Canadian market demands. The development of grapes, vegetables, and forage crops, especially in the North Okanagan, is expected to compensate losses in tree fruits, resulting in little change in irrigated acreage in agriculture to 2020.

13.1.2 Projection II - High Economic Growth

Higher rates of economic growth for the Okanagan than those anticipated for Projection I were assumed by stimulation of additional investment in the manufacturing sector through a renewed industrial incentives program hypothesised to be in effect between 1980 and 1990. This would create growth in the economy through both direct expansion in the manufacturing sector, and indirect economic effects of this expansion on other sectors of the economy.

Direct demands in the resource and non-resource based manufacturing sectors were increased relative to those in Projection I for each of the designated years (2000 and 2020), approximately in the same proportion as the documented impacts on these sectors resulting from the actual incentives program of the late 1960's. Impacts of this increase growth rate on related sectors of the economy were analysed by the input-output model, and using the same productivity per worker ratios as employed in Projection I, total employment was estimated. These totals were broken down into the four sub-regions according to

the distribution trends used in Projection I, with appropriate adjustments for differential employment growth ratios and land resource constraints.

Land use policy is similar to that for Projection I, except that greater population and industrial growth should produce somewhat greater pressure for the creation of larger tracts under residential and industrial reserves, particularly within or immediately adjacent to large urban centres.

As a result, there was a projected decline in irrigated acreage in the Okanagan, especially near the urban centres around Okanagan Lake, where most of the increased population is expected to be located. This decline was calculated on the basis of an average density of 10 persons per acre. There was no significant difference in the irrigated acreage totals for the North and South Okanagan regions, as increased population pressures in these areas do not appear to be sufficient to offset increased agricultural activities.

13.1.3 Projection III - Low Economic Growth

The basic assumption underlying the development of Projection III is that a lower rate of economic development and associated population growth will enable a higher natural environmental quality to be maintained. This perception was apparent from the public briefs submitted to meetings held by the Okanagan Basin Water Board and from an analysis of a questionnaire survey of a sample of valley residents (see Chapter 10). In addition, the public involvement task forces placed emphasis on environmental protection and preserving the quality of life in the valley with economic growth occurring only within this framework. Task force members agreed that a relative slowing down in the rate of economic growth over the next 20 years or so would not only provide a better opportunity for planning growth within the environmental framework, but also allow the option of increasing the rate of growth at some future date should economic hardships result. This approach would be less easily achieved if the rapid rate of growth forecast in Projections I and II were to occur.

To provide a reasonable range in economic growth rates between Projections, it was felt that population growth should be as low as was realistically possible considering the existing growth potential of the region and its attraction as a retirement centre. In addition, due to the present momentum in the Okanagan economy, it was assumed that significantly slower rates of economic growth would not occur until after 1980.

Between 1951 and 1961, before the stimulation of the Okanagan economy through industrial incentives, population growth in the valley averaged about 1.5% per annum, or about 12% lower than the Provincial average. The Okanagan valley is not an economic island, but is closely interlinked with other regions of the Province and as the Provincial economy and population grows, it is inevitable that the Okanagan, through these economic links, will also grow.

No realistic economic policy can prevent such growth. Thus, it was assumed that population growth in the Okanagan between 1980 and 2020 would grow at a constant rate based on that which prevailed between 1951-1961 in the Province and averaging about 1.3% per annum over the 40 year period. Sub-regional population totals were then obtained using similar distribution patterns as those used in Projection I.

The procedure for assessing the economic consequences of a slower rate of population growth throughout the Okanagan economy was somewhat different than that used in Projection I and II. Using target levels of population for 2000 and 2020 based on proportional increases tied to projected Provincial growth rates, the size of the labour force was determined by using population to labour force ratios employed in Projection I. Total employment in agriculture, tourist and service sectors related to householders expenditures were calculated using the input-output model and forecasts of total demands in these sectors. These labour totals were then subtracted from the total labour force to determine employment in the manufacturing and other service sectors. Direct demands for goods in the manufacturing and service sectors, which promoted most growth after 1980 under Projection I, were revised downwards, so that total employment in both the manufacturing sector and the support industries as calculated from the model would be consistent with the required employment levels. As these reductions in final demands for manufactured goods would, in turn, affect demands for related goods and services provided by other sectors of the economy, the procedure described above had to be repeated a number of times until the outputs of the economic model were consistent with labour force and target populations for the years 2000 and 2020. Because of a possible under-estimation in the rates of increased productivity per worker in some sectors, total employment, and hence population, may be over-estimated in this projection.

Forecasts of tourism were revised downwards compared with Projections I and II to remain consistent with lower resident population totals and the concept of a slowing down of the pace of economic growth. This applied to all types of tourist activity; commercial holiday visitors staying at hotels, motels and campsites; holiday visitors staying with friends and relatives (due to lower resident population) and business and convention visitors due to lower levels of business activity (for more details see Chapter 16).

To provide contrasts with other Projections, irrigated acreage was forecast to increase over existing levels. In view of the fact that public involvement task forces and residents appear to place considerable emphasis on the value of irrigated agriculture in maintaining the high environmental quality of the region, it was assumed that not only would agricultural lands continue to be protected from residential or industrial sub-divisions, but that senior governments would promote economic incentives designed to encourage farmers to remain on and develop the land. Thus, though there would be some loss of

agricultural acreage in areas already zoned for sub-division, these would be more than offset by gains in other regions. Indeed, it was initially assumed that all remaining available medium and high quality irrigable land in the basin would be developed for agricultural purposes, though in many areas such developments may not be economically justified.

13.2 POPULATION GROWTH

Table 13.1 compares population growth for all three projections to 2020. In all cases, population is forecast to increase from 114,500 in 1971 to 162,000 in 1980 at an annual growth rate of 3.9%. This growth rate, which is somewhat slower than that experienced during the 1966-71 period is based on the assumption that the pace of economic investment will decline following the termination of the industrial incentives program in 1971.

After 1980, population growth under Projection I is expected to increase to 262,000 by the year 2000 (2.4% per annum) and to 391,000 by 2020 (2.0% per annum). In Projection II, the simulated industrial incentives program for the Okanagan is forecast to attract an additional 22,000 people to the valley by 2000 compared to Projection I, and thereafter population is projected to grow at a similar rate as Projection I, resulting in total population of 430,000 by 2020.

Despite assumptions designed to slow down population growth through curtailing industrial expansion in Projection III, population totals in 2000 are expected to total 237,000, only 25,000 fewer than the total for Projection I in the same year. By 2020 however, a more significant decline is forecast resulting in 101,000 fewer residents compared to Projection I. It is worth re-emphasizing that these totals may overestimate possible population growth should attempts be made to control employment opportunities. For all projections, immigration patterns were estimated since this could be an important factor in population growth due to the region's popularity as a retirement area.

13.3 REGIONAL GROWTH PATTERNS

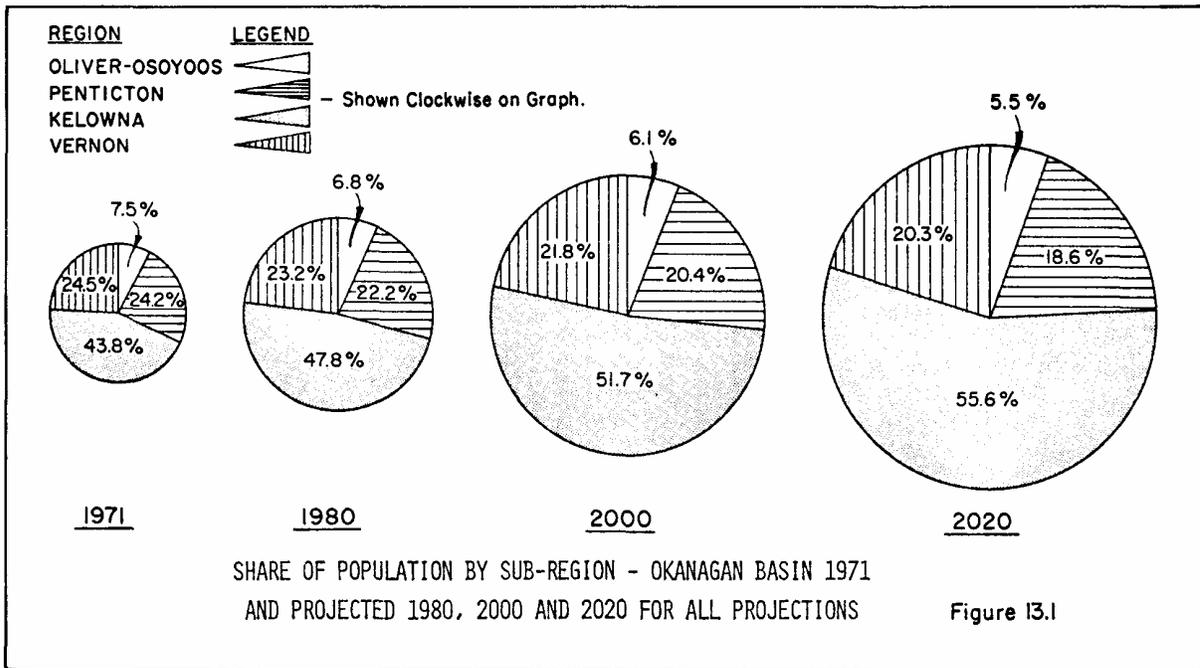
Population growth rates are expected to vary from region to region in the Okanagan. Figure 13.1 and Table 13.1 show that the Kelowna region will continue to grow faster than other regions, increasing its share of valley population from 44% in 1971 to 56% in 2020. This rapid population growth is due to the region's high potential for attracting non-resource based manufacturing industries and attendant services. As transportation improves, the region is expected to provide relatively more service to industries and population in other regions of the Okanagan and in adjacent watersheds.

TABLE 13.1

POPULATION BY SUB-REGION, OKANAGAN BASIN 1961 to 1971, AND PROJECTED 1980, 2000 AND 2020

SUB-REGION	1961	1966	1971	PROJECTED 1980	PROJECTION I PRESENT ECONOMIC POLICIES		PROJECTION II HIGH ECONOMIC GROWTH		PROJECTION III LOW ECONOMIC GROWTH	
					2000	2020	2000	2020	2000	2020
OLIVER-OSOYOOS										
Oliver-Urban	1,774	1,563	1,598	1,700	2,000	2,200	2,200	2,400	1,800	1,800
Osoyoos-Urban	1,022	1,166	1,279	1,600	2,300	3,000	2,500	3,300	2,100	2,200
Rural	3,964	4,732	5,775	7,700	11,800	16,400	12,700	18,000	10,700	12,000
Sub-Total	6,760	7,461	8,652	11,000	16,100	21,600	17,400	23,700	14,600	16,000
PENTICTON REGION										
Penticton-Urban	14,516	16,157	18,955	24,400	35,800	48,100	38,800	52,900	32,400	35,700
Skaha Lake-Rural	736	775	1,036	1,400	2,100	2,900	2,300	3,300	1,900	2,200
Summerland-Urban	4,307	4,585	5,551	7,100	10,400	13,900	11,200	15,100	9,400	10,300
Naramata-Summ.-Rural	848	815	1,141	1,500	2,300	3,200	2,500	3,500	2,000	2,300
Vaseux Lake-Rural	551	904	996	1,600	2,800	4,500	3,100	5,100	2,600	3,400
Sub-Total	20,958	23,236	27,679	36,000	53,400	72,600	57,900	79,900	48,300	53,900
KELOWNA REGION										
Kelowna-Urban	20,809	26,266	35,852	52,800	87,600	132,200	94,900	145,400	79,200	93,000
-Rural	3,195	4,217	8,152	14,800	30,100	55,800	32,700	61,400	27,300	41,400
Wood Lake-Urban	1,857	2,089	3,000	4,500	7,400	11,000	8,000	12,100	6,700	8,200
Peachland-Urban	641	709	1,446	2,500	4,900	8,700	5,300	9,600	4,400	6,400
Westbank-Urban	728	755	1,620	2,800	5,500	9,900	6,000	10,800	5,000	7,300
Sub-Total	27,230	34,046	50,160	77,400	135,500	217,600	146,900	239,300	122,600	161,400
VERNON REGION										
Vernon-Urban	13,697	15,149	18,845	25,200	38,000	52,400	41,200	57,600	34,300	38,800
-Rural	3,247	3,211	3,955	5,000	7,100	9,200	7,700	10,200	6,400	6,900
Kalamalka Lake-Rural	2,161	2,660	3,617	5,300	8,800	13,400	9,500	14,700	8,000	9,900
Armstrong-Urban	1,228	1,426	1,631	2,100	3,100	4,200	3,400	4,600	2,800	3,100
Sub-Total	20,338	22,446	28,048	37,600	57,000	79,200	61,800	87,100	51,500	58,700
TOTAL	75,281	87,179	114,539	162,000	262,000	391,000	284,000	430,000	237,000	290,000

Source: 1. Economic Studies - Okanagan Basin Study
2. Statistics Canada



Most of the growth in the Kelowna region is expected to occur within the boundaries of the expanded City of Kelowna, which in 1971 contained a population of 36,000, and which is projected to increase to over 130,000 under Projection I and II and to almost 100,000 under Projection III. Other economic nodes in the region, such as Westbank, Peachland and Winfield are expected to grow to medium-sized communities of 8 to 10,000 people, but this pattern could be changed if policies to regionalize industrial growth throughout the Kelowna region were implemented. Policies of this nature could encourage some industrial development in the smaller centers in an attempt to control the growth of the City of Kelowna.

The Vernon region is expected to experience the next largest increase in population over the 50 year period. This growth is directly related to anticipated increases in employment in resource-based manufacturing such as wood products and processing; dairy and beef products and associated primary industries, as well as non-resource based industries such as glass and metal fabricating. Again, most of the population growth is forecast to occur in the Vernon urban area, where present totals of almost 20,000 could increase between two or three-fold over the next 50 years.

Due to more limited employment potential, population growth in the Penticton and Oliver-Osoyoos regions is expected to increase at a lower rate than the rest of the valley. Emphasis will continue to be placed on tourism and retirement services, some light manufacturing industries and agricultural production, while Penticton will likely remain as the major service center for the South Okanagan, Similkameen and Kettle River basins.

13.4 EMPLOYMENT

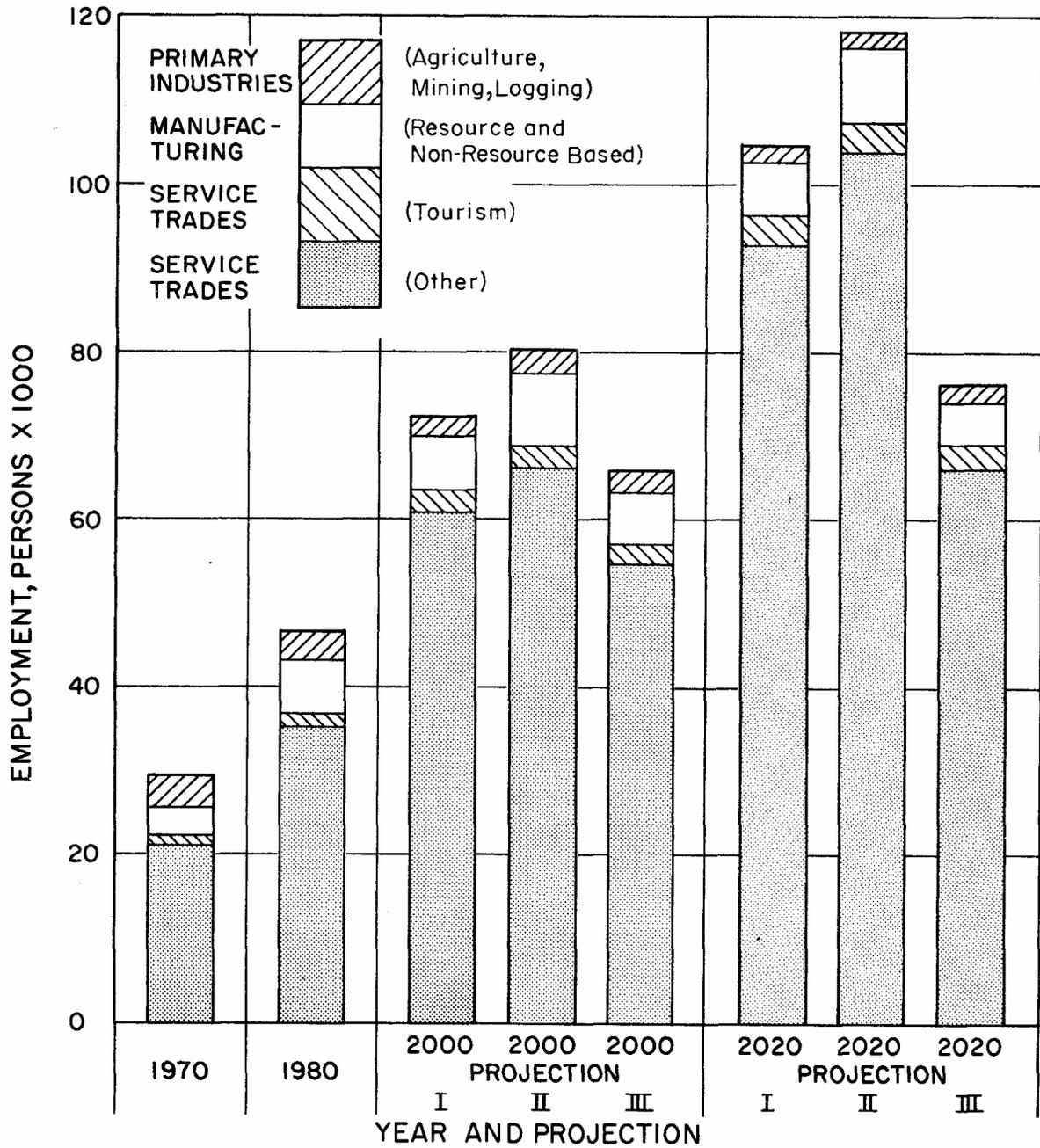
Much of the anticipated variation in population growth can be accounted for through an analysis of projected changes in employment opportunities for each Projection (Figure 13.2). The number of people employed in the Okanagan totalled 29,700 in 1970 and this is expected to increase to 104,900 and 118,500 in 2020 for Projections I and II respectively, compared to 76,400 for Projection III (Figure 13.2). The major thrust of this employment growth lies in the export-oriented manufacturing industries, the non-resource based manufacturing and to a lesser extent, resource-based manufacturing, and in the service trades, which serve the growing Okanagan population. In fact, the service industries, which presently employ 71% of the valley labour force are expected to increase their share of employment to 88% by 2020. Job creation in these service sectors is relatively higher than manufacturing and primary industries, as most services are labour intensive and are consequently less subject to labour productivity increases over time. On the other hand, employment in the primary industries (agriculture, logging, mining) is expected to decline gradually to 2020 due to increasing labour productivity and, in the case of mining and logging, limitation in resource potential. Under Projection III agricultural employment is forecast to remain almost constant to 2000 due to assumed economic incentives to create growth in this sector, but could decline thereafter due to anticipated increases in labour productivity.

The rapidly increasing importance of non-resource based manufacturing and service sectors of the economy expected over the next 50 years is illustrated in Table 13.2. The value of production in non-resource based manufacturing is

TABLE 13.2
VALUE OF OUTPUT BY MAJOR ECONOMIC ACTIVITY
OKANAGAN BASIN 1961, 1970, AND PROJECTED 1980, 2000 AND 2020
(IN THOUSANDS OF CONSTANT 1970 DOLLARS)

	AGRICULTURE	MINING & LOGGING	MANUFACTURING		SERVICES		TOTAL
			Resource Based	Non-Resource Based	Tourism	Other	
1961	31,785.3	N/A	32,937	11,291	5,526	N/A	N/A
1970	40,212.2	29,495.8	44,356.4	84,190.6	11,093.1	306,789.6	516,137.7
1980	61,311.3	36,858.4	88,728.3	273,917.4	18,352.5	758,759.5	1,237,927.4
2000 I	76,335.8	9,979.7	142,959.7	456,537.1	40,460.1	2,037,136.4	2,763,408.8
2000 II	76,073.6	10,802.8	155,069.7	659,287.8	40,460.1	2,273,992.2	3,215,686.2
2000 III	81,581.1	9,838.5	141,244.7	438,301.5	34,600.1	1,816,286.8	2,521,852.7
2020 I	89,025.1	12,188.5	188,238.8	748,539.4	74,733.5	4,871,954.2	5,984,679.5
2020 II	89,711.2	13,458.3	197,087.2	1,050,373.9	74,733.5	5,436,780.5	6,862,144.6
2020 III	98,570.8	11,284.7	182,249.6	597,701.6	63,584.7	3,479,339.6	4,432,731.0

SOURCE: I/O Tables



EMPLOYMENT BY MAJOR ECONOMIC SECTOR IN THE OKANAGAN BASIN FOR 1970 AND PROJECTED 1980, 2000 AND 2020.

Figure 13.2

predicted to expand over 12-fold by 2020 under Projection II (which assumes incentives to encourage such growth) and nine-fold under Projection I. Even higher rates of expansion in output are forecast for the service sectors. In comparison, the value of production from resource-based manufacturing is only expected to grow four times over the same 50 year period. Despite a possible reduction in actual employment in the agricultural sector, the value of agriculture production should more than double by 2020 in all Projections.

The geographical distribution of employment opportunities closely parallels that of population (Table 13.3). The Kelowna region presently provides about 40% of all jobs in the manufacturing and service industries, but this share is expected to increase to between 45 and 50% for manufacturing and to 60% for services by 2020 in all Projections. The total Kelowna regional labour force of just over 12,000 is estimated to increase between four and five times over the 50-year period for all Projections to between 40,000 and 62,000. By comparison, the Vernon total is expected to grow from 7,500 to between 16,000 and 25,000 depending on the Projection, the Penticton total from 7,700 to between 15,000 and 24,000 and the Oliver-Osoyoos total from 2,300 to between 4,400 and 6,800. Variations in the relative share of employment in the agricultural and tourist sectors between regions can be expected and these are discussed in more detail in the following sections.

13.5 AGRICULTURE

When discussing agricultural potential in the Okanagan, it must be stressed that projections of irrigated acreages and crop production are relatively more uncertain than projections of growth in other sectors. In view of the recent introduction of the B.C. Land Commission Act, which protects agricultural land from sub-division, no assessment can yet be made of its effectiveness in achieving its goal. Consequently, a range of assumptions on future changes in irrigated land use was made to provide some variation in the future water requirements by agriculture and thus expose the capability of the water resource to meet these demands to a sterner test.

Table 13.4 presents the distribution of irrigated acreage by crop type and region for each Projection. In Projection I, the existing total of 60,000 acres is expected to decline slightly to 59,600 increased pasture acreage in the North Okanagan mainly offsetting declines in agricultural acreage within the urban areas of the basin. Acreage in the Penticton and Kelowna regions will likely decline more significantly from present levels due to land banking for industrial, commercial and residential purposes, while acreage in the Oliver-Osoyoos regions will probably increase due to increasing demands for grapes and soft-fruits which are particularly suited to this region.

TABLE 13.3 OKANAGAN BASIN
EMPLOYMENT BY MAJOR ECONOMIC ACTIVITY AND REGION,
1970 & PROJECTED 1980, 2000 & 2020

YEAR	REGION	AGRICULTURE	MINING & LOGGING	MANUFACTURING		SERVICES			TOTAL
				Resource Based	Non-Resource Based	Tourism	Other	Other (Incl. Gov't)	
1970	Oliver-Osoyoos	551	33	47	88	126		1,461	2,306
	Penticton	659	48	438	554	441		5,524	7,664
	Kelowna	1,024	471	680	1,021	360		8,673	12,229
	Vernon	398	112	599	744	194		5,527	7,574
	Total	2,632	664	1,764	2,407	1,121		21,185	29,773
1980	Oliver-Osoyoos	700	20	50	280	170	1,980		3,200
	Penticton	660	40	410	860	620	8,510		11,100
	Kelowna	1,060	320	600	2,010	550	16,560		21,100
	Vernon	450	90	970	1,200	280	8,410		11,400
	Total	2,870	470	2,030	4,350	1,620	35,460		46,800
2000 Projection I	Oliver-Osoyoos	640	20	20	290	360		3,270	4,600
	Penticton	460	30	300	950	940		13,220	15,900
	Kelowna	830	80	400	2,360	940		30,990	35,600
	Vernon	440	70	800	1,390	460		13,440	16,600
	Total	2,370	200	1,520	4,990	2,700		60,920	72,700
2000 Projection II	Oliver-Osoyoos	620	20	20	360	360	3,620		5,000
	Penticton	440	30	290	1,210	940	14,690		17,600
	Kelowna	780	80	400	3,430	940	33,770		39,400
	Vernon	480	70	900	2,000	460	14,490		18,400
	Total	2,320	200	1,610	7,000	2,700	66,570		80,400
2000 Projection III	Oliver-Osoyoos	690	20	20	270	320	2,880		4,200
	Penticton	500	30	300	890	730	11,950		14,400
	Kelowna	890	80	400	2,210	850	27,970		32,400
	Vernon	450	70	790	1,310	430	12,050		15,100
	Total	2,530	200	1,510	4,680	2,330	54,850		66,100
2020 Projection I	Oliver-Osoyoos	490	10	10	300	490		4,700	6,000
	Penticton	320	10	170	1,030	1,240		18,230	21,000
	Kelowna	590	30	220	2,670	1,310		50,680	55,500
	Vernon	400	30	510	1,480	620		19,360	22,400
	Total	1,800	80	910	5,480	3,660		92,970	104,900
2020 Projection II	Oliver-Osoyoos	500	10	10	390	490	5,400		6,800
	Penticton	290	10	170	1,300	1,240	20,690		23,700
	Kelowna	560	30	230	3,880	1,310	56,690		62,700
	Vernon	460	30	660	2,160	620	21,370		25,300
	Total	1,810	80	1,070	7,730	3,660	104,150		118,500
2020 Projection III	Oliver-Osoyoos	530	10	10	230	400	3,220		4,400
	Penticton	360	10	170	800	1,050	12,910		15,300
	Kelowna	680	30	220	2,050	1,110	36,310		40,400
	Vernon	380	30	480	1,080	520	13,810		16,300
	Total	1,950	80	880	4,160	3,080	66,250		76,400

TABLE 13.4

IRRIGATED ACREAGE BY SUB-REGION, 1970-2020

SUB-REGION	1970	1980	PROJECTION I		PROJECTION II		PROJECTION III	
			2000	2020	2000	2020	2000	2020
OLIVER-OSOYOOS								
Tree Fruits	5,716	5,270	5,220	5,080	5,160	4,960	5,460	5,460
Pasture	3,872	3,580	3,550	3,460	3,510	3,380	3,560	3,550
Other	1,368	3,240	4,330	5,460	4,330	5,460	5,180	6,390
TOTAL	10,956	12,100	13,100	14,000	13,000	13,800	14,200	15,400
PENTICTON								
Tree Fruits	8,905	7,510	6,400	5,680	6,190	4,880	7,520	7,660
Pasture	2,290	2,650	2,970	3,090	2,970	3,090	3,150	3,310
Other	139	240	350	430	330	430	330	430
TOTAL	11,334	10,400	9,700	9,200	9,500	8,400	11,000	11,400
KELOWNA								
Tree Fruits	14,259	13,190	12,010	11,200	11,510	9,730	14,170	15,160
Pasture	5,885	5,860	5,690	5,510	5,590	4,980	6,630	7,050
Other	2,003	2,050	2,600	3,190	2,600	3,190	2,600	3,190
TOTAL	22,147	21,100	20,300	19,900	19,700	17,900	23,400	25,400
VERNON								
Tree Fruits	2,939	2,720	2,500	2,290	2,500	2,290	2,560	2,440
Pasture	11,652	11,890	12,440	12,750	12,440	12,750	16,180	17,600
Other	1,042	1,290	1,360	1,460	1,360	1,460	1,360	1,460
TOTAL	15,633	15,900	16,300	16,500	16,300	16,500	20,100	21,500
BASIN								
Tree Fruits	31,819	28,690	26,130	24,250	25,360	21,860	29,710	30,720
Pasture	23,699	23,990	24,650	24,810	24,510	24,200	29,520	31,510
Other	4,552	6,820	8,620	10,540	8,620	10,540	9,470	11,740
TOTAL	60,070	59,900	59,400	59,600	58,490	56,600	68,700	73,700

Despite increasing pressures for sub-dividing agricultural land under Projection II, total irrigated acreage is expected to decline only about 4,400 acres to 56,600 by 2020. Assuming there will be some relaxation of the controls on agricultural lands consistent with a general policy for encouraging economic growth in the valley, there could be significant decline in orchard land, however, especially in the Kelowna and Penticton regions, where almost 5,000 and 3,000 acres could be lost respectively. These acreage declines would be partially compensated for by increases in grape acreages, particularly in the Oliver-Osoyoos region, and pasture in the North Okanagan. It is worth noting that according to land capability studies, the Okanagan appears to be able to support 430,000 people and over 55,000 acres of irrigated agricultural lands, which, assuming relatively modest increases in productivity, could supply the Western Canadian agricultural market potential.

In Projection III, it was assumed that all medium and high quality agricultural lands (Canada Land Inventory Classes 1,2 and 3) would be developed for irrigated agriculture. This assumption allowed for a maximum projection of possible irrigation development and because irrigated agriculture is the largest consumer of water (see Chapter 4), resulted in a high estimate of future water requirements. Although irrigated acreage totals presented in Projection III are not necessarily supported by economic principles, they did permit the Consultative Board to check whether water and land resources in the valley are capable of supporting these projections in competition with other demands.

According to the assumptions discussed above, by 2020 irrigated acreage in the valley could total 73,700 acres. Although there would be average increases in each sub-region, the most extensive new developments would take place in the Oliver-Osoyoos region (grapes) and the Vernon region (pasture), though there is also potential for developing new orchards in the Kelowna region. Much of this increased acreage would occur on Indian Lands, in fact about 13,000 acres of Indian Reserve land situated mainly at the head of Okanagan Lake and in the Oliver-Osoyoos region consists of prime agricultural land. Whether or not this land will be developed for agricultural purposes depends on future landuse policies of the Indian Bands, but in lieu of any definite plans for this land, it was assumed under Projection III that it would be irrigated, and thus the availability of water to supply this expanded irrigated acreage could be assessed (see Chapter 14).

In all three Projections, agriculture continues to play an important role in the valley economy. Table 13.5 presents the value of production of major agricultural crops for each Projection to 2020. Although tree fruit production will continue to dominate the agricultural economy of the Okanagan, its share of the total crop value is expected to decline from 75% at present to between 65 and 70% depending on the Projection. The value of grape, livestock and dairying production is anticipated to increase at a relatively faster pace than other agricultural products. Indeed, by 2020 it is possible that the Okanagan

TABLE 13.5

VALUE OF AGRICULTURAL PRODUCTION IN THE OKANAGAN VALLEY, 1970-2020*

PRODUCT	1970	1980	2000			2020		
			Projection I	Projection II	Projection III	Projection I	Projection II	Projection III
Tree Fruits	30,380	46,700	53,030	50,800	57,180	56,100	53,330	65,590
Grapes	1,500	3,290	5,850	5,850	6,690	7,610	7,610	8,530
Livestock	2,750	3,120	4,530	5,030	5,390	6,470	7,490	8,150
Dairying	1,540	2,480	4,915	5,915	4,680	8,020	9,610	6,990
Vegetables	1,240	1,770	2,130	2,130	2,130	2,390	2,390	2,390
Field Crops	480	680	1,050	1,280	1,040	1,540	1,890	1,380
Poultry Eggs	1,300	2,100	3,560	3,800	3,210	5,510	6,000	4,150
Nursery	1,020	1,170	1,270	1,270	1,270	1,390	1,390	1,390
TOTALS	40,210	61,410	76,335	76,075	81,590	89,030	89,710	98,570

Sources: B.C. Department of Agriculture
 B.C. Grape Marketing Board
 B.C. Interior Vegetable Marketing Agency
 Economic Studies, Okanagan Basin Study

*Data in Thousands of Constant 1970 Dollars

could become an important supplier of meat and dairy products for the growing urban populations in the Lower Mainland of British Columbia.

In Chapter 3, it was mentioned that 70% of farms in the Okanagan Valley are presently under 70 acres and that almost half the farm units earned under \$2,500 per year. These basic characteristics of farming are expected to continue to 2020 in Projection I and III, though it could be anticipated that under the more rigorous economic assumptions prevailing in Projection II, there would be some attempt to increase farm sizes and gross value of production in order to remain competitive with other claims for the limited land and water resources in the basin. In the other two Projections, particularly Projection III, it can be assumed that small farms will continue to provide large social benefits but limited economic returns, which will be, in all likelihood, supplemented by other sources of income. Under these assumptions, large increases in productivity and the development of more efficient farming methods including water application schedules cannot be anticipated on a widespread basis.

13.6 TOURISM

Visitors come to the Okanagan for three principal reasons - on holiday, business, or to attend conventions. Because of the relatively small difference in future estimates of visitor days between Projections I and II, only two projections of growth after 1980 were analysed, known as high growth (Projections I and II) and low growth (Projection III). The provision of a range of future tourist demands emphasizes the uncertainty associated with predicting tourist

visits to the Okanagan over the next 50 years and serves as a more rigorous test for the evaluation of shoreline landuse and water resource management needs. In the case of business and convention visitors, forecasts for future demands were tied to the growth of business activity in the valley for each Projection. Variation in the levels of business opportunities and availability of suitable sites for conventions formed the basis for the regional distribution of these projections.

Because of the importance of holiday visitors in the tourist industry, relatively more detailed estimates of future participation were attempted. The questionnaire surveys described in Chapter 7 indicated the places of origin of tourists staying in commercial accommodation and hence the proportion of Okanagan tourists in the total population of the area of origin could be determined. For example, the Lower mainland of British Columbia contained a population of 1,160,000 in 1971 and contributed an estimated 198,400 holiday tourists to the Okanagan or 171 tourists per 1000 population. Appropriate visitation rates were then applied to projected populations in each of the regions from which tourists originate for 1980, 2000 and 2020 respectively. The estimated numbers in the various regions were then integrated to provide an estimate of the total number of holiday visitors staying at commercial accommodation. In the case of visitors staying with friends and relatives, a visitation rate of 1.3 visitor days per resident was determined, and this rate was applied to projected resident populations in Projection I and for the high growth estimates of summer tourism.

In the case of the low growth projection, no rational basis for estimating reduced holiday tourist participation could be determined, and consequently, an arbitrary procedure was employed. Projected increases in the number of tourists staying at commercial accommodation between 1980 and 2000 and 2020, under the high growth Projection were simply halved, under the assumption that the future supply of commercial accommodation could be limited to act as a constraint on tourist population. Reductions in the growth rate of visitors staying at private households were obtained by applying current visitation rates to the tower population totals associated with Projection III.

In all cases, the present average length of stay of convention and business visitors (20 days) and holiday visitors in the Okanagan (6.4 days) was assumed to continue over the next 50 years. Thus, the total numbers of visitor-days could easily be obtained from the estimated number of visitors by multiplying by the appropriate factor. There are possible indications that the length of stay could vary over time, but no data were available to check this premise. Sensitivity tests on a range of participation rates for beach and angler days were employed to test the capability of the land and water resources to support a wider range of demands, and these are reported upon in Chapter 16.

TABLE 13.6

VISITOR DAYS IN THE OKANAGAN, 1970-2020

1970	KELOWNA	PENTICTON	OLIVER- OSOYOOS	VERNON	TOTAL
Holiday	909,200	1,285,200	375,900	749,000	3,319,300
Business	95,000	54,300	20,000	63,900	234,000
Convention	8,600	126,100	---	17,900	174,300
TOTAL	1,012,800	1,465,600	418,400	830,800	3,727,600
1980					
Holiday	1,336,300	1,800,900	539,100	1,051,200	4,727,500
Business	151,500	75,900	23,300	91,300	342,000
Convention	11,500	170,600	---	24,400	206,500
TOTAL	1,499,300	2,047,400	562,400	1,166,900	5,276,000
2000 High Growth					
Holiday	2,207,400	2,650,800	1,104,900	1,673,200	7,626,300
Business	245,600	107,000	32,000	137,000	521,600
Convention	87,200	199,500	---	55,900	342,600
TOTAL	2,540,200	2,957,300	1,136,900	1,866,100	8,500,500
2020 High Growth					
Holiday	3,113,000	3,606,100	1,539,800	2,293,300	10,552,200
Business	413,800	156,200	46,800	219,000	835,800
Convention	144,700	241,100	---	96,500	482,300
TOTAL	3,671,500	4,003,400	1,586,600	2,608,800	11,870,300
2000 Low Growth					
Holiday	1,873,900	2,245,300	952,300	1,414,300	6,475,800
Business	239,600	102,800	32,000	132,200	506,600
Convention	199,500	---	55,900	242,600	342,600
TOTAL	2,313,000	2,348,100	1,040,200	1,789,100	7,325,000
2020 Low Growth					
Holiday	2,638,000	3,024,200	1,266,200	1,934,600	8,863,000
Business	309,200	115,200	34,200	161,200	619,800
Convention	144,700	241,100	---	96,500	482,300
TOTAL	3,091,000	3,380,500	1,300,400	2,192,300	9,965,100

Projections of holiday, business and convention visitor-days for the four sub-regions of the Okanagan basin are shown in Table 13.6. The total number of visitor-days under the 'high growth' Projection is expected to triple from 3.7 million in 1970 to 11.9 million in 2020, and to more than double under the 'low growth' projection to 9.9 million. Almost 90% of these visitor days will continue to be enjoyed by holiday visitors, about 7% by business visitors and 4% by convention delegates. This distributional pattern should remain basically the same for both projections.

Summer holiday visitors, that is those visiting the Okanagan during June, July, August and September presently represent over 90% of all holiday visitors and this trend is expected to continue unless there are persuasive efforts by the Okanagan communities to increase non-summer activities such as skiing, fishing and hunting. During the questionnaire survey, the vast majority of summer tourists indicated their preference to holiday during the four summer months.

Projections of summer holiday tourists are shown in Table 13.7. It is estimated that by 1980 there will be almost 684,000 summer tourists compared to 485,400 in 1970. According to the high growth projection, this total will

TABLE 13.7
SUMMER HOLIDAY VISITORS 1970-2020

YEAR	COMMERCIAL ¹	NON-COMMERCIAL ²	TOTAL	GROWTH INDEX
1970	334,000	151,400	485,400	100
1980	472,500	211,200	683,700	141
2000 Hi	763,300	322,100	1,085,300	224
2020 Hi	1,054,700	516,100	1,570,800	324
2000 Lo	617,893	312,800	930,700	192
2020 Lo	908,986	382,800	1,291,800	266

¹ Visitors staying at motels, hotels, & campsites.

² Visitors staying at private residences

exceed 1 million by 2000 and reach 1.5 million by 2020. Even in the low growth projection, over 1.2 million summer visitors are forecast to enter the Okanagan by 2020. Table 13.7 also differentiates the total number of summer tourists by type of accommodation. Approximately two-thirds of the total number of summer visitors are expected to stay at commercial accommodation. There are some changes in the proportion of summer tourists staying at private homes between the two projections in keeping with the differences in projections of total population. Assuming the current average lengths of stay of summer tourists continues in the future, 4.4 million summer holiday visitor-days are expected to be spent in the Okanagan in 1980, compared with 3.1 million in 1970, rising

to over 10 million and 8 million by 2020 in the high and low projections respectively (Table 13.8.)

TABLE 13.8
SUMMER HOLIDAY VISITOR DAYS 1970-2020

YEAR	COMMERCIAL	NON-COMMERCIAL	TOTAL	GROWTH INDEX
1970	2,141,100	970,500	3,111,600	100
1980	3,028,800	1,353,800	4,382,600	141
2000 Hi	4,892,500	2,064,500	6,957,100	224
2020 Hi	6,760,600	3,308,300	10,069,000	324
2000 Lo	3,960,700	2,005,300	5,966,000	192
2020 Lo	5,826,600	2,453,700	8,280,300	266

Some shifts in the relative regional shares of visitor participation are anticipated. For example, Penticton's share of holiday visitor-days is forecast to decline from 39% of the basin total in 1970 to 34% by 2020, while the Oliver-Osoyoos regional share could increase from 11% to 15% over the same period. This increase is based on anticipated improvements in transportation links between the region and the Lower Mainland and development of the recreational potential around Osoyoos Lake, especially on Indian Lands. Similarly, relative increases in holiday visitor-days in the Kelowna region are expected due to the region's growing share of residential population and consequent increase in visitors staying at private homes. Convention and business visitor-days in the Kelowna and Vernon regions are predicted to increase relative to those in the Penticton region, reflecting increased economic activity in the northern parts of the basin.

13.7 PROJECTIONS OF THE SUMMER VISITOR EXPENDITURES

In Chapter 7, expenditure by holiday visitors was shown to be an important component of the Okanagan economy and a possible indicator of the value tourists place on water-based recreational activities. Summer visitors spent an estimated \$11.5 million in 1970, approximately \$5.9 million of which remained in the Okanagan as direct income to valley residents. Future estimates of summer holiday visitors expenditures were calculated by multiplying average per capita purchases in 1970 by projected visitor populations and adding 15% of the real value per decade to take into account anticipated increases in per capita spending. These total expenditure estimates were broken down into four categories consisting of purchases of accommodation and food, retail goods, agricultural products (mainly tree fruits, grapes and vegetables) and other services. The net income remaining in the Okanagan was calculated from the input-output economic model.

Total purchases and net income received from summer holiday visitors to the Okanagan are presented in Table 13.9. Under the high growth Projection, current expenditures of \$11.5 million are anticipated to increase over six times to almost \$70 million by 2020 and by more than five times to \$59 million under the low growth projection. Net income derived by Okanagan residents from these expenditures should increase relative to total expenditures due to increased per capita spending.

TABLE 13.9
PURCHASES BY SUMMER HOLIDAY VISITORS AND
TOTAL INCOME DERIVED BY OKANAGAN RESIDENTS
(Constant 1970 Dollars)

YEAR	PURCHASES	INCOME	NET INCOME PER VISITOR DAY
1970	\$11,511,800	\$ 5,883,700	\$3.50
1980	18,918,700	11,393,700	4.83
2000 Hi	39,901,000	28,084,300	7.46
2020 Hi	69,395,400	53,062,900	7.31
2000 Lo	32,996,500	23,231,300	9.86
2020 Lo	59,072,900	45,171,400	10.09

The major social and economic characteristics of the three economic projections in the year 2020 are compared in Table 13.10. In essence, there are few significant differences in Projections I and II suggesting that considerably greater investments in industrial development than occurred during the Industrial Incentives Program of the late 1960's would be required to increase the pace of economic growth significantly. This conclusion is more indicative of the present healthy state of the Okanagan economy than the inability of the basin economy to absorb a faster pace of investment.

Under Projection III, population growth rates could be significantly reduced by a reduction in the availability of job opportunities, and thus, a slowing down in the rate of economic investment. It should be emphasized that if population totals are to be constrained, investment in the so-called 'clean' industries, such as carpet, trailer and glass manufacturing may be necessary in addition to controls on development of resource-based industries such as wood products and food processing which are more usually associated with public concerns about pollution.

Reduction of the rate of employment growth appears to be the only realistic way of controlling the pace of economic growth and consequent population increase. Other approaches, such as placing quotas on migration into the basin, do not appear practical at this time. Placing some restrictions on job availability, however, may in turn create other social problems in the valley. There is

TABLE 13.10

EXAMPLES OF RANGE OF ECONOMIC GROWTH THAT MAY OCCUR IN THE OKANAGAN VALLEY TO THE YEAR 2020

PROJECTION	DESCRIPTION OF PROJECTION	POPULATION	EMPLOYMENT	TOTAL VALUE OF BASIN INCOME (millions) [†]	VALUE OF BASIN INCOME PER PERSON (dollars) [†]	IRRIGATED ACREAGE* (acres)	TOURISTS
1970 Situation		115,500	29,800	\$ 280.8	2,590	60,000	700,000
<u>Projection I</u> Continuation of Existing Economic Policies	Continuation of existing economic growth policies in the valley. The high rate of population, employment and industrial development experienced in the past 10 years is expected to continue until 1980 and then gradually decline over the next 40 years to 2020. In accordance with present government policy, agricultural lands in the valley will be protected from subdivision for residential and industrial purposes.	391,000	104,900	5,060.3	12,900	59,600	2,300,000
<u>Projection II</u> High Economic Growth	Growth that may be realized if the Okanagan economy is stimulated through senior government support for industrial development and employment-creating activities. To provide a contrast with the first projection described above, it is assumed that existing controls on subdivision of agricultural land would be relaxed and some transfers of land-use from agriculture to residential and industrial development would result.	430,000	118,500	5,682.6	13,200	56,600	2,300,000
<u>Projection III</u> Low Economic Growth	Growth that may be realized if there is a retardation of the current economic trends through controls on industrial development. These controls would apply to both non-resource based, or clean industries, such as trailer manufacturing, as well as resource based industries such as lumber mills and pulp mills. In this projection the emphasis would be on environmental quality, agricultural lands would be protected from subdivision, and additional agricultural development encouraged.	290,000	76,400	3,725.1	12,800	73,700	1,800,000

* Totals for Irrigated Acreage in 2020 are preliminary and subject to revision.

[†] Figures shown based on 1970 Dollars

already a relatively larger proportion of older people (over 50 years) in the Okanagan compared to the Province as a whole, and restricting the pace of employment can only aggravate this situation as the younger age groups seek employment outside the basin. This, in turn, could lead to a continued decline in the rate of natural births in the valley. In addition, due to the attractiveness of the area for retirement and the gradual reduction in the retirement age, it may be expected that relatively more middle-aged and older people will decide to move to the valley.

Residents will have to compare these consequences of a low growth policy with some of the social and environmental benefits, such as lower population densities, especially in urban areas and greater greenbelt and recreational space. Some of these characteristics are compared in the three Projections in Table 13.11. Presently, average urban population densities average about 5.6 people per acre, but this density could almost double to 10.6 people per acre, in 2020 under Projection I, in which agricultural land is preserved and higher urban densities can be anticipated. Urban densities under Projection II may be expected to be somewhat lower than in Projection I, because of the small increase of sub-division of agricultural lands, but there would be less green space in the basin. Under Projection III, urban densities would be the lowest of all three Projections, together with the lowest ratio of population per acre of irrigated land compared with the other projections.

Under Projection III, due to the relative decrease in the rate of economic growth compared with Projections I and II, total income in the valley and per capita income could be lower. This impact is not expected to be significant, however, as the generally buoyant and diversified economy in the Okanagan under all three Projections is expected to result in large increases in income per capita over current levels.

In conclusion, the Okanagan Valley has a soundly based economy, which is expected to grow steadily over the next 50 years. Only through careful economic planning, however can the present healthy balance between economic growth and high environmental quality be maintained. The opportunities for water and related resource management necessary to achieve the economic, environmental and social goals for the Okanagan within this framework of economic growth are discussed in detail in the following chapters.

TABLE 13.11

POPULATION AND AGRICULTURAL STATISTICS, 1970-2020

FEATURE	1970 (1971 Census)	1980	PROJECTION I		PROJECTION II		PROJECTION III	
			2000	2020	2000	2020	2000	2020
1. Population								
Urban	89,861	124,700	197,000	285,000	213,800	314,400	177,900	211,900
Rural	24,672	37,300	65,000	105,700	70,200	115,600	59,100	78,100
TOTAL	114,539	162,000	262,000	391,000	284,000	430,000	237,000	290,000
2. Population Density (People per acre)								
Urban	5.65	6.24	8.21	10.57	7.91	9.83	7.73	8.48
Rural	0.27	0.39	0.63	1.05	1.00	1.92	0.54	0.67
3. Urban Area (Acres)	15,910	20,000	24,000	27,000	27,000	32,000	23,000	25,000
4. Agricultural Area								
Irrigated (acres)	60,070	59,500	59,400	59,600	58,500	56,600	68,700	73,700
Pop. per Irrigated Acre	1.91	2.72	4.41	6.56	4.85	7.60	3.44	3.93