THE RHETORIC AND REALITY OF ALLOTMENT GARDENS AND SUSTAINABLE DEVELOPMENT:

THE CASE OF ALLOTMENT GARDENS IN WINNIPEG, MANITOBA

BY

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A Thesis
Submitted to the Faculty of Graduate Studies
In Partial Fulfillment of the Requirements
For the Degree of

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ABSTRACT

The number of people growing food in cities is increasing. This trend parallels the rapid growth of cities in the last decade and the accompanying problems of unemployment, environmental degradation and poverty. Thus, urban agriculture is being promoted as a sustainable urban activity with the potential to alleviate poverty while enhancing environmental health and, consequently, contributing to the societal goal of sustainable development. Allotment gardening, a system of urban agriculture devised in the 1800s in England whereby people rent small plots of land to grow food, has been practiced in Canadian cities also. While it was originally devised as a poverty alleviation strategy, allotment gardening is now largely considered a recreational activity and its links to sustainable development are not clear.

This thesis investigates how allotment gardens in Winnipeg, Manitoba, a city with both high levels of urban poverty and a sustainable development strategy, contribute to a more sustainable urban community. To this end, allotment gardens, gardeners and allotment plot land use are described. Then, five research questions, framed by the theme conceptual model of sustainable development, are used to assess the contribution of Winnipeg's allotments to sustainable development. Data were collected on allotment gardeners, plot cultivation techniques and selected indicators of sustainable development using a questionnaire survey instrument administered by face-to-face interviews with selected gardeners.

The results show that even though sustainable development is embodied in civic policy, the reality is that Winnipeg's allotment gardens do not contribute to sustainable development to the extent they do in some other cities. They were not located so that they could be utilised by the poor as a coping strategy, nor was access equitable and gardeners were not realising potential economic benefits. Furthermore, gardeners did not broadly use organic gardening techniques and the City of Winnipeg did not have any regulations or programs in place to promote their use.

Conclusions are that to contribute to sustainable urban development, allotments must be located so that they can be used by those seeking to reduce family food budgets as well as people looking for recreation. In addition, institutional structures need to be in place to ensure their development and vitality.

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CHAPTER 1

INTRODUCTION

1.0. Study Background

Advocates of sustainable urban development advance the notion that gardening on urban plots can contribute to sustainable development by providing a means of alleviating poverty and promoting self-reliance, while conserving and protecting natural resources. Allotment plots, i.e., small plots of land used for gardening, were first made available to urban factory workers in the 1800s in Europe to help them secure a source of food. It proved to be a popular strategy to tackle problems of urban poverty at that time, and the practice quickly spread throughout Europe and to North America (Lawson 1994, 3). Interest in allotment gardening declined after World War II, but has increased again in the 1990s as some governments and development organisations seek solutions to increasing ecosystem degradation and poverty.

Today, cities and their citizens have an immense impact on global and local ecosystems as urban population and consumption increases. For the first time in history, 50 percent of the world's population is living in urban centres, and there is a projected increase of 65 percent in this population by the year 2025 (United Nations Centre for Human Settlements 1996, xxi). While urban populations are growing faster in the developing world, those in higher-income cities in Europe and North America require large amounts

of resources and energy to maintain high consumption lifestyles, which draw heavily on ecosystems (Roseland 1997, 17). In addition, much of the waste generated by these urban processes is dumped back into ecosystems faster than it can be assimilated, thus contributing to problems of air and water pollution and solid-waste disposal (United Nations Centre for Human Settlements 1996, 143).

Poverty and associated problems of malnutrition and food security are also prevalent in cities. The increasing number of urban poor (in 1996 estimated to number 200-600 million worldwide by the United Nations Centre for Human Settlements (UNCHS)) are continually struggling to acquire food, water, shelter and clothing. They have neither access to basic and essential nutrients for their families nor the means to acquire them (United States and Canada 1996, 1). The poor and malnourished also live in Canadian cities and in 1996 it was estimated that 16 percent of families, most in urban areas, were living under the poverty line in Canada (Lochhead 1996, 7).

At the same time, urban development and planning are being framed within the larger societal goal of sustainable development (Buckingham-Hatfield 1996). The economic growth approach[1], which prevailed for the last 200 years, is being questioned and other strategies that seek to link urban social systems to ecosystems such as ecological planning[2], healthy communities, social ecology and bioregionalism are being advocated

[1] When development is the result of market forces that encourage the constant expansion of production often at the expense of the environment which is seen as a factor of production (Jacobs 1993, 26)
[2] A planning concept that seeks to integrate artificial environments with natural environments and assumes human dependence on and responsibility for nature, and that ecological well-being is essential for community well- being (Roseland 1997, 30)

(Roseland 1997). Much of this impetus to develop sustainable cities has come from a renewed sense of urgency regarding global environmental and economic problems and their consideration by national governments at international fora sponsored by the United Nations, such as the Earth Summit in 1992 and Habitat II held in 1996.

It was at Habitat II in 1996, a United Nations Conference on Human Settlements, that the United Nations Development Programme (UNDP) released the book Urban Agriculture: Foods, Jobs and Sustainable Cities. The authors of this book and other researchers are supporters of the view that urban agriculture can contribute to sustainable development by providing a means to alleviate poverty and protect ecosystems concurrently (Roseland 1997, Sachs 1990, UNDP 1996). Both the UNDP and Canada's International Development Research Centre (IDRC) have instituted programs to support the development of city farming while community activists in many cities are establishing community gardens and working to gain support at various levels of government (IDRC 1994). Furthermore, some civic governments in Europe and Canada are now integrating urban agriculture into land-use planning (ETC 1997a).

Farming in the city is not new. People have cultivated land in and around human settlements since they were established. The practice remained common in most cities in Europe until the late nineteenth century when the advent of modern transportation systems and rise of urban health and sanitation issues came to dominate urban planning and management (Thompson 1997, 169).

Overall, city farming had declined by the early twentieth century in European and North American cities (Hough 1995, 13, 214). The sights, sounds and smells of farming were considered polluting, unclean and detrimental to human health. Consequently, farming was relocated to land outside the city limits in peri-urban rural areas, and it was only allowed to flourish in urban areas during times of great need such as World War I and World War II (Hough 1995, 212). While traditional forms of urban-oriented agriculture such as market gardening and dairy farming were pushed to the periphery of many of these cities, allotment plot programs were started as urban populations swelled. During the post-World War II building boom, however, even well-established allotment gardens suffered as urban land became increasingly valuable for housing, industrial and commercial development (Hynes 1996, xv). At this time municipal authorities showed little interest in protecting and promoting city farming so that during the 1950s urban household food production declined everywhere except in small towns (United Nations Development Programme 1996, 46).

This decline, however, was reversed in the 1980s when growth in urban agriculture was evident in European cities such as London and Stockholm and in the Canadian centres of Montreal, Toronto and Vancouver (Connolly 1997,2; Greenhow 1994, 8; Reid 1996a, 1). This increase has been attributed to such inter-related factors as population growth, increasing urban poverty and environmental degradation resulting in mounting pressures on people and the environment (Dahlberg 1998a, United Nations Centre for Human Settlements 1996). Even though sustainable development is increasingly being advocated as a solution to these pressing social and environmental problems, little

progress has been made in implementing it (International Institute for Sustainable Development 1997b, 1). More specifically, there is a paucity of information on ways to integrate urban agriculture, particularly that type practised by individuals for their own benefit, into both community development and planning efforts guided by the concept of sustainable development.

1.1. Aim and Objectives

The aim of this study is to investigate how allotment gardens in Winnipeg contribute to a more sustainable urban community. It seeks to further our understanding of urban allotments and their role in sustainable urban development. This will be accomplished by:

1) Undertaking an inventory of allotments in Winnipeg.
2) Gathering demographic and socio-economic information on those accessing the allotment garden plots.
3) Determining land-use patterns within the allotment garden sites.
4) Developing a set of sustainable development indicators and assessing the contribution of the allotment gardens to sustainable urban development based on these indicators.

1.2. Scope of the Study

It was decided to undertake the study in the city of Winnipeg, Manitoba for several reasons:

1) The practicality of conducting the field survey.

2) Little information had been published on urban agriculture in Winnipeg.
3) Sustainable development policy had been embedded in provincial and civic policy.
4) There were high rates of urban poverty in Winnipeg at the time of the study (Lochhead 1996, 7).
5) The International Institute for Sustainable Development, an international research institute with an active program in measuring sustainable development, was located in Winnipeg, and would serve as a reliable source of sustainable development information for the study.

The most compelling reason to use Winnipeg as a study area, however, was the degree to which both the City and the province of Manitoba had been involved with environmental issues and sustainable development. For instance, the province of Manitoba initiated a sustainable development strategy within a year of the publication of Our Common Future, the report of the World Commission on Environment and Development, in 1987, the outcome of which was the passage of the Sustainable Development Act[3], in 1997 (Manitoba 1997).

Similarly, Plan Winnipeg: Toward 2010, a civic planning document, states that "the City seeks to fully integrate sustainable development considerations within the planning, budgeting, and development process" (Winnipeg 1993, 40). According to this plan, the City aims to become a model of sustainability by pursuing several avenues; namely, reinforcing positive environmental attitudes, attracting pro-environment industry and business, and encouraging sustainable development practices in both the public and private sectors (Winnipeg 1993, 40).

[3] Manitoba's Sustainable Development Act is almost unique in that few other jurisdictions worldwide have similar legislation (survey done by the researcher for the International Institute for Sustainable Development in 1996).

Plan Winnipeg (1993) specifically considers:

1) Environmentally responsible decision making.
2) Water conservation and source protection.
3) Waste minimisation.
4) Waterways initiatives (to enhance potential of rivers as community assets).
5) Management of sensitive lands.
6) Energy conservation.
7) Noise reduction.
8) Air quality measures.
9) Social equity.

Having decided on the study area, the next step was to define the scale of analysis. This was accomplished by starting with the definition of urban agriculture given by the UNDP, which was developed in the 1990s when UNDP undertook a global survey of urban agriculture. It is broadly defined as:

> ...an industry that produces, processes and markets food and fuel, largely in response to the daily demand of consumers within a town, city or metropolis, on land and water dispersed throughout the urban and per-urban area, applying intensive production methods, using and reusing natural resources and urban wastes, to yield a diversity of crops and livestock [and]...[these commodities reach the consumer and/or markets the same day that it is harvested] (United Nations Development Programme 1996, 3).

This definition encompasses a wide range of urban agricultural activities including horticulture, aquaculture, poultry and animal husbandry, and provision of wood for fuel. Consequently, allotment gardening[4], a form of urban agriculture whereby small plots of

[4] An allotment is defined in the British Allotment Act of 1922 as a plot of approximately 250 square metres "which is wholly or mainly cultivated by the occupier for the production of vegetables or fruit crops for consumption by himself or his family" (Couch 1997, 278). More recently, the Vancouver Board of Parks and Recreation defined it as "a piece of land used by

urban land are rented for the purpose of growing food for the plot-renters and their families, was selected for several reasons:

1) Animal husbandry, aboriculture and aquaculture were not practised to any extent within the boundary of Winnipeg.
2) Winnipeg had several established allotments from which a sample could be drawn.
3) Allotment plots were grouped at larger garden sites, which meant that certain aspects of sustainable development such as the transmission of knowledge and institutional structure could be investigated.

1.3. Organisation

The context and problem for investigation are established through a literature review and historical overview of allotment gardening in Britain, Germany, Sweden and Canada in Chapter 2. These countries were chosen as allotment activity in them illustrates the diffusion of allotments and allotment culture throughout Europe and into Canada. The physical and cultural characteristics of today's allotments are then described along with broader social constraints and influences on allotment gardening.

The concept of sustainable development is described in Chapter 3, along with several conceptual models being used to assess progress towards sustainable development. From these models, the theme conceptual model was used to frame this research, and it is more extensively discussed, along with the rationale for using it. This model is then used to frame allotment gardening issues drawn from the historical overview that are relevant to sustainable development. Here, Montreal's community garden program is described in

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individuals to produce food and flowers for the personal use of society members" (Vancouver Board of Parks and Recreation, 1996).

some detail, as it further illustrates the relationships between sustainable development and allotment gardening.

This information is subsequently used, in Chapter 4, to define the conceptual framework and research questions for the study. Various other aspects of the research method such as questionnaire design and structure, determination of the sampling frame and the field survey are also outlined. The allotment garden sites and their management and motivations and attitudes of the gardeners are described and explained in Chapter 5. This chapter also considers any spatial differences that may exist between garden sites and allotment culture at these sites. Chapter 6 turns to the assessment of the contribution of these allotment gardens to sustainable development. Each research question is examined using information from the field survey with comparisons being made to Montreal's gardens, which are considered to be a model for other communities to emulate. These research questions concentrate on such issues as: poverty alleviation; economic benefits that increase the gardener's self-reliance; equitable access to plots; use of organic gardening techniques; and social benefits that increase an individual's wellbeing. The final chapter provides conclusions that can be deduced from the analysis and closes with a set of more general conclusions and recommendations for further research.

1.4. Summary

The twin issues of food security and environmental degradation are pressing, and urban agriculture is being promoted as one strategy capable of meeting some of these complex

challenges facing society today. Allotment gardening, a form of urban agriculture, also has a role to play. At the outset, the relationship of allotment gardens to sustainable urban development lacks clarity. The role, which it does and can play, needs further definition before its usefulness as a sustainable development strategy can be better employed. Thus, the aim of this thesis is to investigate how allotment gardens in one city, namely Winnipeg, Manitoba, contribute to a more sustainable urban community.

Since their inception, allotments have contributed to community development and well-being in many ways, and were, in turn, shaped by larger social forces and events. Therefore, to better understand their potential role in sustainable development, it is first useful to investigate their historical and current roles in communities. This, then, is the subject of the next chapter.

CHAPTER 2

DEVELOPMENT OF ALLOTMENTS IN EUROPE, CANADA & WINNIPEG

2.0. Introduction

Allotments have endured as part of the urban landscape since the mid-1800s. Their history now spans over 150 years and they have experienced periods of growth and decline that parallel other major social trends and changes. While the previous chapter broadly introduced urban agriculture and sustainable development, this chapter narrows the focus to look at allotment gardening, its development and contribution to communities. The discussion opens with the 1845 legislation in Britain that legally established the first allotments. It continues with a description of their initial development in Britain, Germany, Sweden and Canada through to the next period of substantial growth that occurred during World War II. Subsequently, there was a decline in their popularity after the War, although their prevalence did increase again during the 1970s and again in the 1990s when environmental concerns and sustainable development brought more interest in cultivating them.

European allotment culture was brought to Canada and Winnipeg by the many waves of European immigrants arriving here at the beginning of the twentieth century and is, consequently, of particular importance to this study, as it augments what little information was found on Winnipeg's allotment culture. Aspects of allotment culture generally are discussed more thoroughly in the latter part of the chapter. As this

overview will disclose, the impact of allotments on communities has been significant in some communities and at particular times, and allotments themselves continue to be shaped and constrained by larger social forces.

2.1. History of Allotments: 1845-1939

Allotments were born out of rural-urban migration in Britain during the 1800s when farm workers were displaced from employment on the land by "innovatory farming methods, new patterns of ownership, or by the agricultural depression that began in the 1870s" (Crouch 1997,18). As the number of labouring poor and landless increased, the General Inclosure Act of 1845 made it mandatory that small parcels of land for growing food, called allotments, be reserved for labourers and communities in rural areas to compensate for loss of land (Garnett 1996b, 17). This practice spread to the cities as landless peasants and the rural poor moved to urban areas looking for work in the emerging industrial towns of the nineteenth century. Thus, urban allotments evolved within a culture of "working-class agitation for improved conditions and self-help" within cities. Access to land was a major issue and allotments were created to provide a source of land for growing food to supplement the low wages of non-agricultural labourers (Crouch 1997, 18). By the late nineteenth century "philanthropic organisations, the church, private employers such as the railways and mines mobilised resources and supported allotment garden movements" (Mbiba 1995, 147). Urban gardening was seen by trade unions and self-help organisations as a way for urban labourers to earn extra income, supplement household diets and reduce dependence on employers as well as a source of recreation for

the poor and unemployed. Using land for allotments created some controversy, however, as some saw them as assistance to the poor, while others, such as John Stuart Mill (1806-73), a social activist, saw them as poor compensation for insufficient wages (Garnett 1996a, 301).

The United Kingdom made provision for the establishment of urban allotments in the "Small Holdings and Allotments Act" of 1908 (Garnett 1996b, 17). This Act made it mandatory "for local authorities to provide and rent out allotments" (Garnett 1996a, 301). By 1918 there were between 1.3 and 1.5 million allotments in Britain which produced approximately two million tonnes of vegetables. After World War I (1919) further legal, administrative and institutional arrangements were made for allotment gardens. These included their inclusion in all town-planning schemes and a requirement that Ministerial Consent was needed for their disposal, which made it difficult for them to be given over to other forms of land development (Mbiba 1995, 148). "Widespread unemployment in the late 1920s and 1930s continued the interest in food growing", with several philanthropic schemes being established to supply needed seeds and garden inputs for the unemployed (Garnett 1996a, 301). Allotment gardens existed in all urban areas of the United Kingdom by the 1930s when, in cities such as Leicester, every third household had an allotment (Lawson 1994, 43).

In the nineteenth century, allotment gardening spread and emerged in other European countries, notably Germany and Sweden. In Germany, the first plots were established in Kiel in 1830 as gardens for the poor. Another prevalent type of German allotment,

associated with "physical health and as a resort or refuge for the whole family, started in Leipzig where small garden beds were developed as part of a playground for children" in 1865 (Crouch 1997. 136). Here, people concerned about the lack of open space for play initially established a playground with garden plots for the children, which were taken over by parents when their children's interest waned. Small huts that included living quarters, called arbours, were soon built on the plots—a tradition, which continues in Germany today (Groning 1996).

Also, by the 1900s, workers' organisations in Germany had started to provide allotments for labourers, and this activity closely followed the development of many allotments in Britain. For example, a Berlin gardener and recent official of a national gardening organisation, reported that allotments in Berlin were born out of the workers' movement in the mid-nineteenth century; they were started as an effort by government officials to "control the revolutionary tendencies of workers" (Hurt cited in Kim 1997). The socio-political aspects of allotment gardening also attracted scholarly attention in Germany at that time; for example, an analysis entitled "The Meaning of Small Garden Cultivation for the Workers-question" appeared in 1897 (Groning 1996).

As the number of allotments and administrative needs continued to grow in Germany, gardeners became organised into strong political associations with both state and gardener interests being recognised in the Allotment Garden and Small Rent Law of 1919. This legislation called for the establishment of a local authority for community gardens in all larger communities whose purpose was to work in close co-operation with

municipal authorities on decisions about real estate and residential housing. By the 1930s there were approximately 450,000 garden plots in Germany (Groning 1996).

Development of allotments in Canada follows a similar pattern, as the arrival of many European immigrants during the nineteenth and twentieth centuries (over 555,000 people arrived in Canada between 1900 and 1910 from Great Britain alone) (Bellan 1958, 500) influenced their development. British gardening books and magazines were readily available in Canada in the 1800s and garden design philosophy was imported from Britain to Canada through immigration and the media (von Baeyer 1984, 8). Horticultural societies started by members interested in growing fruit, vegetables and ornamentals slowly became part of Canadian life: the first Ontario society had formed in 1834 and the first Prairie organisation in 1893 (von Baeyer 1984, 70). These societies sponsored educational campaigns for civic beautification and worked towards civic betterment. They sometimes joined with local "improvement societies"—formed by groups of concerned citizens—to run community programs. For example, in Montreal, the City Improvement League of Montreal, founded in 1909, sponsored children's gardens on vacant lots (von Baeyer 1984, 71).

The first allotments started to appear in Canada in the 1890s when the Canadian Pacific Railway, which was expanding in Western Canada and supporting increased settlement of the region, established plots for cultivation along rail lines and at railway stations (Bellan 1958, 128). These plots were meant to encourage pioneers by advertising the "wonders of the west", by providing recreation for employees frequently posted in

isolated spots and by generally beautifying railway property. At one time, the Canadian Pacific Railway oversaw gardens along "25,749 kilometres of track from coast to coast" (von Baeyer 1984, 14).

In the early twentieth century vacant lot gardens[5] emerged in many Canadian cities. These gardens were supported by civic governments and the Canadian Department of Agriculture initially "as a form of welfare for the poor, then as a beautifying measure, and finally as patriotic duty during World War I" (von Baeyer 1984, 3). Related historically to allotment gardening, vacant lot gardening had become a popular gardening movement by 1910 so that, by 1916, vacant-lot associations were found in most Canadian cities. By this time, Guelph, Ontario, had 1600 lots and Montreal, Quebec, 5000, with Toronto, Ontario, reporting 2060 by 1918 (von Baeyer 1984, 95). Sponsors of vacant lot gardening, such as the Toronto Vacant Lots Cultivation Association, saw such gardens as meeting several social needs: patriotism; civic beautification; ridding the city of noxious weeds; controlling sanitation; mitigating unemployment; and teaching thrift and industry to the poor (von Baeyer 1984, 91). This movement, however, died out by the early 1920s as people no longer needed to supplement their income with garden produce and preferred to spend their time with other emerging forms of recreation such as cars and movies (von Baeyer 1984, 96). Plot gardening was not to re-emerge in any significant way in Canada until World War II when Victory Gardens became popular.

[5] Vacant lot gardening: the turning of rubbish heaps into lush vegetable gardens (von Baeyer 1984, 91)

2.1.0. Victory Gardens: 1939-1945

Victory Gardens, allotments that were established during World War II, provided a source of needed food during the war years (Buswell 1980, Lawson 1994, 3). They were prominent in Britain and Canada where urban open spaces, such as parks, utility rights-of-way and vacant lots, were turned into vegetable gardens that were considered crucial to the war effort.

In Britain, "A Cultivation of Lands (Allotments) Order 1939 empowered councils to take over unoccupied land..." (Crouch 1997, 75). By the end of World War II there were about 1.5 million allotment gardens in Britain (Crouch 1997, 76). British gardeners, for example, provided over half the country's fruit and vegetable needs with 121,458 ha of allotments and gardens producing 1.2 million tonnes of food in 1944 (Garnett 1996b, 19). Urban farmers were reported to keep pigs, poultry, goats and bees. "By 1943, there were 4,000 pig clubs comprising some 110,000 members keeping 105,000 pigs" in London alone and "by 1942...916,000 registered poultry-keepers" (Hough 1995, 212).

Victory Gardens also thrived in Canada during World War II. Vancouver citizens alone produced "some 28,363 million tonnes of fresh vegetables and fruit in 1943"—the "equivalent to $20 million (Canadian) worth of supermarket produce at 1979 prices" (Harrowsmith Report in Hough 1995, 214). In 1943, the Canadian Agriculture Department reported that 51,750 MT of vegetables were grown in 209,200 wartime gardens (not necessarily allotments) in Canadian cities with populations of more than

1000. Such efforts supplemented food production generally and released more food for shipment overseas to support the war effort and the immediate post-war rebuilding phase.

Some of Winnipeg's larger allotments were started by horticulture societies in the 1940s as Victory Gardens to aid wartime efforts (Peters 1988, 77). At this time the area now encompassing Winnipeg was composed of 13 municipalities—seven cities, five suburban municipalities and one town—each with its own municipal administration and services (Artibise 1975, 66). Different horticulture societies, which operated independently, existed in many of these cities and municipalities, and of these, The St. James and Fort Garry Horticulture Societies initiated allotment programs during the war years that are still active (Peters 1988, 217, 190). Burlington Northern Santa Fe Railway, formerly the Chicago, Burlington & Quincy Railway, with rail right-of-way running through the heart of Winnipeg, also released land for Victory Gardens during the war years. The administration of these plots was taken over by interested gardeners after the war and they eventually formed the Lindsay Street Garden Club.

Allotment location was strongly influenced by Winnipeg's early settlement patterns, which prevail even today. Non-British immigrants were mainly found in the north part of the city, while those of British ethnic background lived to the west along the Assiniboine River and south following the Red River, and it is here that most of the allotment garden sites are still found (Weir 1972, 24).

2.1.1. Post-war Decline & Growth: 1945-1990

Between 1945 and 1970, declines in allotment gardening were reported in Britain, West Germany, Sweden and Canada, a trend generally attributed to a diminished need to produce food for economic reasons. During this time, living standards climbed as did pressure to use allotment land for new schools, residential developments, roads, commercial facilities and urban parks (Groning 1996). For example, data for Britain show that one-fifth of council allotments were lost in the 1950s, while one-half of private and railway land plots had gone by 1970 (Crouch 1997, 76).

A renewed ecological awareness in the 1970s and the spread of vacant lots because of spiralling land prices in cities, however, revived interest in urban gardening (Howe 1999, 14). In Sweden, people interested in healthier and greener lifestyles reinvigorated interest in plot cultivation in the 1960s and 1970s, so that by 1975 it was recognised as a legitimate land use in Stockholm, thus providing allotment gardeners with more security (Greenhow 1994,8). Howe reports that a similar wave of environmental awareness stimulated "new appreciation of the value of urban food production" in Britain (Howe 1999, 14). Demand for plots increased in many parts of Britain and "some councils developed huge waiting lists in the 1970s: 4060 people in Avon alone, 15,333 in Greater London..." and so on (Crouch 1997, 79). During the 1980s many of these waiting lists were substantially reduced and the "build-up of new plot-holders" levelled out as some potential gardeners found other sources of recreation (Crouch 1997, 80).

Data were not available for Canada during this time; what information there is showed that in the 1970s the first official community gardens were established in Montreal and the National Capital Commission in Ottawa started a public garden rental program. Riverview Gardens, a still active Winnipeg allotment, started around this time. In this case, the Winnipeg Horticulture Society took over the Riverview Hospital gardens in the 1970s and by the early 1980s the newly formed and independent Riverview Gardening Society was managing them (Koch-Schulte 1997, 14).

This growth in allotments was associated with a wave of environmentally related activities motivated by the need for pollution prevention and conservation, which included the establishment of Departments of the Environment by many countries and the United Nations Environment Programme. The 1973 oil crisis also spurred many energy conservation efforts, which continued during the 1980s, with the result being a more diverse group of allotment-holders. Thus, allotments were no longer the domain of mainly the urban poor (Crouch 1997, 81).

2.2. Allotments Today

Recent data indicate that "allotment gardens are popular in Germany, France, the Netherlands, Denmark, Greece and several other European countries", including the former Eastern bloc (Lawson 1994, 44). The European-based International Office of Allotment and Leisure Societies, which has affiliates in twelve countries, represents

230,000 member organisations (Garnett 1996b, 21). Researchers in Germany reported that the largest allotment holders association–Bundesverband der Gartenfreunde e.V–counted about one million members organised into about 14,000 associations representing all parts of the country in 1996 (Walz 1994, 63 in Groning 1996, 3). Non-organised community gardens are estimated to number 100,000 in Germany with 78,000 in the city of Berlin. A 1996 survey in England counted 295,630 plots and estimated another 50,000 in Wales (Crouch 1997, xv). Recent Canadian data show there to be 2270 plots in Vancouver, of which 76 percent had been started since 1990, 2000 plots in Metro Toronto and 6,400 allotments in Montreal in 1997 (Connolly 1997, 2, Cosgrove 1994, 4, Lawson 1994, 44, Reid 1996a,).

2.2.0. Characteristics of Today's Allotments

Allotment gardens are located wherever vacant land is available and local citizens are motivated to establish a garden (Hough 1995, 226). They can be found adjoining apartment buildings or in neighbourhoods composed mainly of single-family dwellings. Many exist on utility rights-of-way—along railway tracks and under hydro-electricity transmission lines. "They are to be seen on the fringe of towns and villages, small and large, scattered among the suburban houses around every city, and even on sites in the city itself..." (Crouch 1997, 1). Often they are located along urban rivers and streams, and some cities allow garden sites in public parks and include space for plots in land-planning schemes. In some cases, privately owned vacant land is turned into plots. Allotments can be found at virtually any place where there is not a more profitable use

for land: they are essentially "just spaces left over" in the urban landscape (Crouch 1997, 1).

Garnett (1996a, 301) defines allotments as "small plots of land in urban areas rented out cheaply to those wishing to grow their own food". British, German and Canadian allotments are fairly similar at the scale of the garden site. Generally the allotment gardens provide patches of green in the midst of pavement and concrete and, as many gardeners will testify, a home to urban wildlife (Crouch 1997, 13). Garden sites are subdivided into garden plots, which are usually rectilinear and rented to plot holders. This traditional rectilinear plot shape was criticised in the Thorpe Report on British allotments in 1969, which recommended that plot shape should change to make plots more aesthetically pleasing. It was part of a desire to shift the image of allotments held by some politicians and members of the public at the time from what they saw as 'neglected eyesores' to more picturesque 'leisure gardens' based on the aesthetics of the English flower garden[6] (Crouch 1997, 9).

Sites in Germany and Sweden differ from those in Britain and Canada, as small cottages are frequently built on individual garden plots. These buildings are inhabited at least for part of the year, but can only take-up a portion of the plot, for at least one-third of the land (an average of 100 m^2) must be devoted to vegetables or fruits or flowers (Kim 1997). Crouch reports that European allotment gardeners "take it for granted that they can sleep on their plots"; a practice, which never gained acceptance in Britain or Canada.

[6] The English landscape garden style, which has flourished since the 1700s, is based on 'natural' forms rather than man-made geometric order. Irregular, informal forms predominate (Encyclopaedia Britannica 2000).

British gardeners have, though, a tradition of building small makeshift sheds at their plots.

The Thorpe Report also noted a lack of amenities at British garden sites in comparison with recreational sites like golf courses and school playing fields, or to allotments in other parts of Europe. In the 1970s only 50 percent of British allotments had a piped-water supply and less than 7 percent had toilets. Alternatively, other European sites had "adequate water supply, car parking and play areas for children, communal club house and permission to erect summer houses" (Crouch 1997, 92). The reason for this discrepancy may be, at least partly, because of tenure arrangements. In Germany plots are leased for 20 years and often stay in the family much longer, while British leases are often only for one year (Lawson 1994, 44).

The size and number of plots and renters at each allotment site varies considerably. For example, an allotment garden in Oxford, England, dating from 1852, covered 3.6 ha and had 96 plots, with each plot equal to about 400 m^2 and was used by about 130 people (Garnett 1996b, 50). Another area in Leeds had 115 allotment sites covering 113.4 ha with approximately 5000 plots holders; hence each plot occupied about 200 m^2 (Howe 1999, 17). Berlin is reported to have 800 garden colonies (allotments with cottages) that are rented to some 84,000 plot holders. One colony—Kolonie Oeynhausen—has been in continuous use since 1904 and average plot size is 300 m^2 (Kim 1997). In Vancouver, Canada, garden sites have between 110 and 374 plots each with plots measuring 90 m^2 or

6 x 15m on average (Connelly 1997,2). Montreal, Canada, had 73 garden sites of various sizes with a total of 6,400 allotments in 1997 (Reid, 1997a, 2).

2.2.1. Allotment Culture & Organisation

Crouch, a British cultural geographer, describes allotments as a

> ...contemporary sub-culture that has a peculiar relationship with place and landscape, and the way in which people find meaning in their surroundings and in their everyday lives; how the surroundings that they create are an expression, a representation of their own culture of shared conditions, activities and relationships; and the wider culture in which they appropriate that space...(Crouch 1997, 17).

People in the 1990s work allotments for a variety of reasons, including: recreation; for the enjoyment of working with the soil and connection with nature; and as a source of organically grown vegetables: and a way to supplement family income (Garnett 1996b, 11). Furthermore, "concern has deepened over the ecological side effects and health risks posed by intensive, chemically dependent farming techniques (Howe 1999, 14). Lawson (1994, 44) maintains that in Britain, allotment gardening is mainly a recreational activity that is strongly supported by the desire for organically grown food rather than a subsistence activity. This position is supported by Crouch (1997, 26) who states that many allotment holders "have come to find the allotment as an enduring pastime rather than a necessity to augment the family budget". Similarly, much of the present interest in allotment gardening in Sweden remains attributed to an increase in environmental awareness and the desire to build sustainable communities. Here, recycling is an

important component of the allotment-gardening system; hence planners regularly include composting facilities, kitchen gardens and greenhouses into housing projects (Greenhow 1994,10).

Allotment plot holders usually organise themselves into allotment or garden societies to administer allotments under their jurisdiction. Data from Europe and Canada indicate that the majority of gardeners belong to such organisations. For example, in Stockholm, allotment gardeners must belong to the Swedish Association of Allotment and Leisure Gardeners, one of five associations that make up the National Association of Leisure Gardeners (Greenhow 1994, 8). Allotment or garden societies are membership driven, have their own by-laws and are governed by an executive. Such allotment societies may provide educational workshops on themes such as organic gardening, use of greenhouses, community responsibility and council regulations (Mbiba 1995, 161). Garden shows are common and often coincide with competitions for the best produce. These societies also provide an opportunity for gardeners to participate more fully in decisions regarding their plots as well as a structure that enables input at the political level. In Germany, for example, garden societies have gained substantial political influence and regularly participate in lobbying efforts to ensure the continued existence of their plots (Kim 1997). In addition, representatives of garden societies are contact persons for others such as civic administrators wanting to reach gardeners.

Not all plot holders, however, are organised into gardening societies. In some instances, plots are rented either directly from the city or from private landowners. One example is

Toronto where all the allotment programs are run and administered by the city (Cosgrove 1994,4). Private landowners include utility companies—railways, electrical companies and airports— that have made their utility rights-of-way available for cultivation since the late 1800s. Such has been the case in the Canadian cities of Montreal, Toronto and Winnipeg, where there is a history of using such utility rights-of-way for garden plots (Reid 1997a, Werier 1985.1). Other private and sometimes non-profit organisations, such as hospitals and seniors' homes, also run allotment garden programs.

Gardeners represent diverse groups that include higher- and middle-income earners as well as the poor; both men and women who are employed across a range of jobs—semi-skilled labourers, managers and professionals, and the retired and non-wage earning homemakers (Lawson 1994,4, Nugent 1997,2). They tend to be older adults, although there are programs for school-age children at some allotments (Reid 1997,6).

Gardeners share many values. For example, Crouch talks about the "gift relationship" permeating allotment culture. "Every gardener has, during the season, gluts and scarcities, and through the year is both a donor and a recipient" (Crouch 1997, 96). Gardeners frequently give away their surplus to older and/or poorer people than themselves, trade seeds and plants, and share their produce with each other. They also experience a common feeling of connection with the land; communal experiences in the act of cultivating, yet accomplishing individual work. Their efforts constitute a "tradition of criticism of modern urban industrial society", a return to the land and an aesthetic adventure (Crouch 1997. 157).

2.2.2. Gardening Techniques

There are many factors that influence the cultivation methods on allotments. These include: plot size, availability of water, possible vandalism, weeds, distance of the plot from home, drainage and soil quality (Crouch 1997, 172). Row cultivation dominated in Britain until the 1970s, when other methods such as planting in squares, interplanting and use of deep and raised beds were thought to make cultivation easier. Now, some allotment societies are promoting organic methods, with some places, such as the City of Montreal, making it a requirement. Lawson (1994, 44) noted a slight increase in organic gardening techniques [7] by allotment gardeners in Britain. This is supported by Howe's (1999) analysis of allotments in Leeds and Bradford, which concluded that

> ...allotment practice still follows traditional patterns of reliance on chemical methods, undermining the environmental case for allotments, although there is some evidence that organic practice may be spreading, particularly amongst younger and newer allotment holders (Howe 1999, 22).

A 1992 survey by the Nottingham Wildlife Trust found that allotments provide important urban wildlife environments (Lawson 1994, 44). Some gardeners have adapted their cultivation methods to support wildlife and biological diversity through the use of organic methods, retaining trees, providing scrub areas and composting (Crouch 1997, 183-185)

[7] Organic gardening can be defined as a production technique that emphasises the maintenance of soil fertility and productivity without resorting to synthetic chemical fertilisers and harmful pesticides, but rather uses composting, animal manure, mulching, crop rotation, biologically fixed nitrogen and cover crops and biological pest control (Barrs 1997, 39)

2.2.3. Constraints and Influences on Allotments

Allotment gardening is constrained and shaped by the values and beliefs of the larger community. Constraints include biases about the urban environment that may deem allotments to be inappropriate. Often, allotment gardening is perceived as a marginal activity with some considering it to be a blight in the urban environment. Lack of official recognition means that allotments may not receive necessary resources, such as access to water or institutional support to ensure tenancy, provide training or control theft. Furthermore, gardeners may not be able to organise so that the continued existence of their plots is ensured because of their wide dispersion and lack of cohesion. Even in countries such as Britain, Germany and Sweden, where gardeners are organised into associations with some political clout, and legislation is in place that legitimises allotment gardening as a viable land-use, allotment plots are frequently threatened with take-over for other developments. The result is loss of urban green space and recreational land (Groning1996, 8). Other socio-economic trends, such as unemployment rates and cost and availability of food, for example, also influence demand for plots.

Civic authorities at various levels of government play an essential role in the vitality of allotment gardens, as they make land-use planning decisions that can either help or hinder the functioning of the gardens. Pressure from allotment holders in some regions has resulted in the formal recognition of allotment gardening by authorities and the establishment of various policies and laws to protect, administer and guide their development. For example, the Federal Republic of Germany has a national law

governing gardens, which provides rules for rental charges and lease conditions, while in other countries such provisions are made at the municipal level (Greenhow 1994, 10). National legislation notwithstanding, the fate of allotments is usually decided at the municipal level where land-use planning and zoning decisions are made. Cities such as Berlin and Stockholm have included and secured land for allotment gardening in recent land-use plans (Greenhow 1994, Groning 1996,). The Canadian cities of Vancouver and Montreal have also recognised urban gardening to be a legitimate land-use. The Vancouver policy on community gardens outlines the roles of both civic administration and non-profit associations, terms of use, fees, management, responsibilities and access procedures (Vancouver Board of Parks and Recreation 1996). In both Montreal and Vancouver, it is the city that facilitates and assists interested groups in finding, starting and managing the plots (Reid 1997a, Vancouver Board of Parks and Recreation 1996).

2.3. Conclusion

Gardening on urban allotments has grown and declined in response to larger socio-economic trends over the past 150 years. It grew in popularity as cities grappled with issues of urban poverty and unemployment at the end of the 1800s and expanded to meet the need for increased food production during the two World Wars. However, it declined substantially in Britain, Sweden, Germany and Canada from 1945 to 1970 as people's income increased and allotment land was turned into roads, buildings and housing. Since the 1970s, this activity has rebounded in popularity mainly as a recreational activity.

Allotments are found wherever land with no better use is available: in and around buildings and houses, in parks, along rail lines or river ways. The land is a subdivided into rectilinear plots of varying size that are rented to gardeners. In Britain it is common for small garden sheds to be part of the allotment landscape, while in Germany and Sweden cottages or even small chalets with living quarters may be constructed on the plots, though neither feature is present on allotments in Toronto or Montreal.

The people who shape allotments include gardeners, garden societies and associations, plot owners, and civic authorities. Gardeners come from a range of socio-cultural and - economic backgrounds and cultivate their holdings for a variety of reasons such as necessity, recreation or ecological concerns. While some gardeners rent plots directly from owners and operate independently, many are members of gardening societies that act as intermediaries between owners and gardeners. Such societies organise and manage the plots on behalf of the gardeners and can frequently lobby civic authorities and landowners about decisions critical to the long-term existence of garden sites that are often targeted for other urban purposes.

Though there is an increase in popularity in allotments and urban gardening, the development of allotments is constrained by several socio-cultural factors such as public perceptions and beliefs that regard garden plots as marginal and unnecessary land uses. Frequently, these perceptions become embedded in policies, laws and regulations that work against the viability of allotment plots. Also, allotment gardening may be jeopardised by the inability of gardeners to organise secure plot tenancy.

The numerous allotment plots in countries like Britain and Germany attest to the influence that they can have on communities, and this is further substantiated by their level of organisation. Undoubtedly, allotments offer amenities to communities such as green space and opportunities for recreation, and these along with their historic links to poverty alleviation make them an attractive strategy for sustainable urban development. Thus, the next chapter will provide a closer examination of sustainable development and how it relates to allotment gardening.

CHAPTER 3

SUSTAINABLE DEVELOPMENT & ALLOTMENT GARDENING

3.0 Introduction

The concept of sustainable development, which is germane to this study, has evolved from environmental and developmental issues identified as being important to public welfare by various governments and non-governmental organisations during the latter part of the twentieth century. Even though much work was undertaken during the 1990s to define and implement sustainable development at local, national, and international levels, little research was found prior to this study that specifically examined the sustainability of allotments. Consequently, it was necessary to establish a framework for this analysis.

A logical point for such an assessment framework is one of the most frequently used definitions of sustainable development, that of the Brundtland Commission. This definition is explained along with some of the conceptual underpinnings of sustainable development that are found in the literature. Next, five conceptual models[8], which are currently being used, are briefly described. The theme conceptual model, which was chosen to frame this research, is subsequently discussed in more detail. To clarify the structure of this model two examples of its use at the urban level are given. The historic

[8] Model is used here to "generalise the common conceptual structure of similar frameworks" (after Hardi et al. 1997: 61)

and implicit links of allotment gardening to sustainable urban development are then established and framed within the theme model. The cohesion of this framework and allotment garden issues is further strengthened by describing Montreal's Community Garden program, which has proved to be an impressive model of how sustainable development principles are incorporated into allotment gardening.

3.1. The Concept of Sustainable Development

Ways to implement sustainable development were first discussed by the World Conservation Union in its World Conservation Strategy in 1980, and since then the topic has been the focus of many international conferences and meetings such as the Earth Summit in 1992. Even so, it is still frequently portrayed as being vague and ambiguous by some researchers (Becker 1999, 4; Maclaren 1992, 1). The challenge, then, is to bring greater clarity to this contested concept.

Though debates have ensued around the vagueness of the definition of sustainable development and how to put it into operation, there is agreement that "humanity's current development path is not sustainable" (Hardi et al. 1997, 5; Moffatt 1996; Norgaard 1994). Considerable evidence currently exists to support the view that society is already operating outside sustainability bounds (Jacobs 1993, Wackernagel and Rees 1995). Indicators, which show the extent of ozone depletion, soil erosion, desertification, species extinction, deforestation and poverty, illustrate the severity and nature of the problems facing humankind (Clayton 1996, 5).

The World Commission on Environment and Development (WCED), otherwise known as the Brundtland Commission, popularised sustainable development during the 1980s after extensive consultations with thousands of people worldwide (Moffatt 1996, 18; Norgaard 1994, 11). Thus, sustainable development emerged out of this process both as a societal goal and as an organising concept, and is appearing with greater frequency on policy and planning agendas of governments and many non-governmental organisations (UNCHS 1996, 421). Milbrath (1994, 439) argues that this worldview is challenging the current dominant paradigm that "promotes economic growth as an unquestioned good, which is also the preferred means to reduce poverty and inequality."

The dynamics of sustainable development are captured in the definition of the term as proffered by the Brundtland Commission, which is:

> ...development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED 1987,8).

This concept includes the notions of inter- and intra-generational equity; the access to, distribution and use of resources now and in the future. While the goal of equitable development, that of "meeting the needs of the present", is not new and has historically driven much development, the Brundtland Commission, however, put a renewed emphasis on meeting the needs of the world's poor while simultaneously protecting ecosystems (Mitlin 1994, 4). Inter-generational equity, whereby future generations are ensured of meeting their own needs, obliges present generations to conserve and protect life-sustaining ecosystems for their use by future generations (Moffatt 1996, 29).

Hardi et al. (1997, 1) noted that the Brundtland Commission's definition of sustainable development "offer[s] a generally shared interpretation or contextual definition of sustainable development" that is somewhat different from the World Conservation Strategy. While the latter stressed environmental integrity as well as economic issues, the former placed equal emphasis on human development, i.e., poverty alleviation and environmental integrity, thus presenting a concept of sustainable development that is about meeting the needs of both the environment and the poor concurrently.

3.2. Conceptual Models of Sustainable Development

Conceptual models of sustainable development bring further clarity to this concept and illustrate how it can be framed for analysis. These models also demonstrate that a range of approaches can be used to put sustainable development into operation, and present possible frameworks for linking sustainable development to allotment gardening.

Sustainable development captures the interrelationship and interdependence of social systems and ecosystems. It is based on accepted precepts about nature and people, and the complex, dynamic, interacting systems that they form (Bossel 1996a, 143). Many different theoretical and conceptual models addressing human-ecosystem interaction, including various sustainable development models, have been articulated (Hodge 1993,7). Hodge and Hardi, two Canadian-based researchers working on sustainable development modelling and assessment, have identified five categories of conceptual models currently being used to assess progress towards sustainable development:

economics-based, theme, stress-response, linked human and ecosystem, and multiple capital models (Hardi et al. 1997, 61-66). These models utilise similar approaches to demonstrate ecological, economic and human dimensions and interactions, but with differences in emphasis and focus. A brief description of each, taken from Hardi et al. (1997), follows:

1) Economics-based models: reflecting input-output models, the current dominant model in this category is the depletion-pollution model which "links the circular economic system, consisting of production by firms and consumption by households....to the natural life support system (including air, water, wildlife, energy, raw materials and other environmental amenities) through the 'extraction' of resources in one direction and the discharge of 'residuals' in the other."
2) Three-component or theme models: consist of social, economic and environmental components, and will be subsequently described in more detail in the next section.
3) Stress and stress-response models: based on a perceived causal relationship between stress-generating human activities and changes in the state of the natural and social environment. This model frames four categories: the stressor of activities, environmental stress, environmental response, and collective and individual human responses.
4) Linked human/ecosystem well-being model: applies systems ideas to the goal of maintaining or improving human and ecosystem well-being and includes four indicator/assessment domains: ecosystem well-being; interactions between people and ecosystems; human well-being; and synthesis of emergent system properties.
5) Multiple capital models: identifies resource endowments for future generations as four capitals, namely: human-made, natural, human and social capital.

While all the previously described models capture human-ecosystem dynamics, the theme conceptual model, which was first framed in the World Conservation Strategy, is the one used most frequently at the community level and was consequently chosen for this study. This is because examples of its application at the community level were

available and it is relatively easy to apply at this scale of analysis. Therefore, a more detailed description of this model is warranted.

3.3. Theme Conceptual Model

The theme model broadly frames the concept of sustainable development as having three dimensions: social, economic and environmental. Particular aspects or issues of sustainable development relevant to the community using this framework are then developed within these sub-themes, rendering it a flexible tool. In principle, then, it can also be applied to allotment gardens.

Robinson and Tinker (1995) describe each of the three sub-themes of this model as leading to an imperative, with all three imperatives needing to be reconciled to each other. They are:

1) economic imperative, whereby an adequate material standard of living is ensured;
2) social imperative, which provides social structures necessary to maximise human welfare; and
3) environmental imperative, by which the carrying capacity of the Earth's bio-physical constraints are not exceeded.
(adapted from Robinson and Tinker 1995, 183)

In addition, this conceptual model is supported by the "Bellagio Principles: Guidelines for the Practical Assessment of Progress Toward Sustainable Development ", which were formulated in late 1996 by an international group of sustainable development

measurement practitioners and researchers. These experts contended that any assessment of progress towards sustainable development should include consideration of:

1) equity and disparity within the current population and between present and future generations, dealing with such concerns as resource use, over-consumption and poverty, human rights and access to services, as appropriate;
2) the ecological conditions on which life depends; and
3) economic development and other, non-market activities that contribute to human/social well-being.

Furthermore, the assessment should be holistic in that it considers the well-being of social, ecological and economic sub-systems, and additionally, has a practical focus with a limited number of key issues for analysis and indicators (Hardi and Zdan 1997).

As noted by Hardi et al. (1997, 62), the theme conceptual model is frequently described in the sustainable development literature, although there are inconsistencies and variety as to what is included in each of the three themes. For example,

> ...the social element may address some of all of social, cultural, community, health or equity concerns. The environment element may refer to narrowly defined environmental or physico-chemical concerns or, in more general terms, concerns related to ecology, natural resources and environmental development. The economic element addresses traditional economic issues, wealth generation or physical prosperity (Hardi et al. 1997, 63-64).

While commonly used for community-based sustainable development initiatives, the model does not, however, flow from a coherent conceptual framework, but rather

compiles "a suite of indicators that reflects the concerns of communities regarding different issues (themes)" (Hardi et al. 1997, 63).

Two examples of this particular model developed for urban scale sustainable development are provided, and serve to illustrate how this method is being used at the local level. These applications provide insight into how local issues are being framed and, in the case of the second example, the types of indicators that can be used in this model.

The framework in the first example (Table 3.0) was developed by ten Local Government Management Boards in the United Kingdom (Bedfordshire, Cardiff, Fife, Hertfordshire, Lancashire, Leicester, Mendip, Merton, Oldham and Strathclyde) and community stakeholders to measure local sustainable development.

Table 3.0. UK LGMB Framework & Indicators

#	Selected Themes	Detailed Description
1	Resources & waste	Resources are used efficiently and waste is minimised by closing cycles
2	Pollution	Pollution is limited to levels which natural systems can cope with, and without damage
3	Biodiversity	The diversity of nature is valued and protected
4	Localness	Where possible, local needs are met locally
5	Access to basic needs	Everyone has access to good food, water, shelter and fuel at reasonable cost
6	Work	Everyone has the opportunity to undertake satisfying work in a diverse economy. The value of unpaid work is recognised, while payments for work are fair and fairly distributed.
7	Health	People's good health is protected by creating safe, clean, pleasant environments and health services which emphasise prevention of illness as well as proper care for the sick

8	Access to facilities	Access to facilities, services, goods and other people is not achieved at the expense of the environment or limited to those with cars.
9	Crime	People live without fear of personal violence from crime or persecution because of their personal beliefs, race, gender
10	Access to skills & knowledge	Everyone has access to the skills, knowledge and information needed to enable them to play a full part in society.
11	Empowerment	All sections of the community are empowered to participate in decision making.
12	Culture & recreation	Opportunities for culture, leisure and recreation are readily available to all.
13	Aesthetics	Places, spaces and objects combine meaning and beauty with utility. Settlements are "human" in scale and form. Diversity and local distinctiveness are valued and protected

Source: Hardi et al. 1997, 40

While the previous example flowed from a government driven process, the second example (Table 3.1) from Seattle, Washington, shows indicators that were formulated by a volunteer network and civic forum looking to improve the cultural, economic, environmental and social vitality of that city.

Table 3.1. Sustainable Seattle Indicators of a Sustainable Community

Environment
- Wild salmon runs through local streams
- Biodiversity in the region
- Number of good air quality days per year, as reported by the Pollutant Standard Index
- Amount of top soil lost in King County
- Percentage of Seattle streets meeting "pedestrian friendly" criteria

Population and resources:
- Total population of King County (with annual growth rate)
- Gallons of water consumed per capita
- Tons of solid waste generated and recycled per capita per year
- Vehicle miles travelled per capita and gasoline consumption per capita
- Renewable and non-renewable energy (in BTUs) consumed per capita
- Acres of land per capita for a range of land-uses (residential, commercial, open space, transportation, wilderness)
- Amount of food grown in Washington, food exports and food imports
- Emergency room use for non-emergency purposes.

Economy:
- Percentage of employment concentrated in the top ten employers
- Hours of paid employment at the average wage required to support basic needs
- Real unemployment, including discouraged workers, with differentiation by ethnicity and gender
- Distribution of personal income, with differentiation by ethnicity and gender

- Average savings rate per household
- Reliance on renewable or local resources in the economy
- Percentage of children living in poverty
- House affordability gap
- Health-care expenditures per capita

Culture and society
- Percentage of infants born with low birthweight
- Ethnic diversity of teaching staff in the arts for elementary and secondary schools
- Percent of parent/guardian population that is involved in school activities
- Juvenile crime rate
- Percent of youth participating in some form of community service
- Percent of enrolled 9th graders who graduate from high school
- Percent of population voting in odd-year (local) primary elections
- Adult literacy rate
- Average number of neighbours that average citizen reports knowing by name
- Equitable treatment in the justice system
- Ratio of money spent on drug and alcohol prevention and treatment to money spent on incarceration for drug and alcohol related crimes
- Percentage of population that gardens
- Usage rates for libraries and community centres
- Public participation in the arts
- Percent of adult population donating time to community service
- Individual sense of well-being

Source: Sustainable Seattle 1993 in OECD 1997, 73

Even though these models were developed in different countries, they both demonstrate how local issues are being framed by the theme model approach and the concept of sustainable development. They each consider: environmental aspects such as levels of pollution and resource consumption; economic aspects such as employment, poverty and meeting needs locally; and social aspects such as equitable access to facilities, education, health, crime rates, and opportunities for recreation. While the UK example is broader, the Seattle example has several indicators that are specific to that city and region, such as 'wild salmon run through local streams', thus demonstrating how indicators can be developed so that they reflect local values and issues while remaining within the conceptual framework of the theme model. As these two examples show, there is some

flexibility in applying the theme model, which makes it useful for analysing Winnipeg's allotment gardens. The one difference between these examples and this study, though, is that the community issues in the UK and Seattle examples were identified through a multi-stakeholder participatory process, which gave credibility to these issues and their selection process. As it was not possible to undertake this type of process for this study, issues identified in the literature review were used instead.

3.4. Allotment Garden & Sustainable Development Links

Allotment gardening has often been linked to the concept of sustainable development (Garnett 1996b, 9; Howe 1999, 14). In the past, it has been associated with issues now integral to sustainable development such as poverty alleviation and environmentalism. These and other issues emerging from the literature review are subsequently identified and framed by the theme model.

The World Commission on Environment and Development in 1987 specifically noted connections between urban agriculture and sustainable development.

> Officially sanctioned and promoted urban agriculture could become an important component of urban development and make more food available to the urban poor. The primary purposes of such promotion should be to improve the nutritional and health standards of the poor, help their family budgets (50-70 percent of which is usually spent on food), enable them to earn some additional income, and provide employment. Urban agriculture can also provide fresher and cheaper produce, more green space, the clearing of garbage dumps, and recycling of household waste (WCED 1987, 254).

These connections were made more explicit by the research on urban agriculture undertaken by the UNDP, which resulted in the release of their report at Habitat II in 1996 (supra p.3).

Sustainable development concerns intersect with allotment gardening in many ways. Garden sites provide needed green space linking people to nature and urban systems to larger ecosystems (Condon 1996, 33). Furthermore, ecosystems are protected if non-polluting and conserving gardening methods are employed. For example, organic waste can be diverted from the waste stream and used on gardens as compost (Nelson 1996, 13). Other environmental benefits include reduced transportation costs and associated energy use, since up to 90 percent of fresh vegetables and fruits are now brought great distances to market [9] (Garnett 1996a, 300).

Gardening can also contribute to social and economic well-being. Garden produce supplements family food requirements and reduces the family food budget. In some instances it provides local employment, improves control over food production and fosters citizen participation and co-operation (Barrs 1998, 19; Beavis 1993). Also, gardening is a source of nutritious, fresh food for urban residents (Garnett 1996a, 305). Now, as in the past, plot gardening is considered a useful poverty alleviation strategy and a recreational activity that improves quality of life for its participants (UNDP 1996). In

[9] Doug Waterer, a researcher at the University of Saskatchewan, estimated that 85-90 per cent of fresh table vegetables and small fruits come to the Prairies from distant locations such as California and Florida (Waterer in Allerdings 1994, 5).

addition, it enhances educational and community participation opportunities (Blair 1994, 4; Groning 1996, 6).

Table 3.2. Allotment Garden Links to Theme Model of Sustainable Development

Theme (from Hardi et al. 1997, 63-64)	**Allotment garden links**
Environmental: • Physico-chemical concerns • Ecology • Natural resources • Conservation	 • green space • clearing of garbage dumps • recycling of household waste • reduced transportation (energy use) • organic techniques
Economic: • Wealth generation • Physical prosperity	 • reduces family food budget • provides cheaper and fresher produce • opportunity to earn some additional income • provides employment • poverty alleviation strategy
Social: • Social & culture • Community concerns • Health concerns • Equity concerns	 • Source of nutritious food • Local control over food production • Food access • Recreational activity • Educational opportunities • Community participation opportunities

On the basis of the foregoing discussion, Table 3.2 summarises the various ways that allotment gardening can be connected to sustainable development and framed for analysis by using the theme conceptual model. As these connections have not been tested prior to this study, the cohesion between the elements of this model could be considered weak. Consequently, a detailed description of a garden program that is considered sustainable is provided to make these linkages more explicit.

3.5. Montreal's Garden Program

Montreal's garden program, which dates back to 1975, serves as a model for other places. It is considered to be a good example of progressive policy and program implementation and one of the best such programs in North America (Mougeot 1994,12). This successful community-level garden program has virtually eliminated unsanctioned gardens that were being planted on vacant land next to tracks and hydro-electric lines. Administered by the City's Department of Sports, Recreation and Social Development, this program currently oversees 73 garden sites with a total of 6,397 allotments with plots averaging 3 x 6 m in size, and 14,000 gardeners. It is all part of the push by Montreal officials and citizens to make their city into a 'model environmental capital' (Reid 1997a, 1).

The gardening program reflects the City's environmental intent. One of its goals is to "allow citizens of all ages to garden in a community context where they may improve their quality of life as well as their natural environment" (Reid 1997, 3). Horticultural animators, who are city employees, supervise the gardens and offer advice to gardeners. Rules established by the City and local garden committees encourage ecological gardening methods. For example, only environmentally safe pesticides can be used and application of organic fertilisers is encouraged (Reid 1997, 7).

The need for equitable access to gardens is recognised through an explicitly stated goal of allowing democratic and impartial access to garden plots for all interested Montreal citizens. Furthermore, in Montreal there are 73 municipally run gardens "relatively well

distributed throughout the city", with the greatest demand coming from areas with mostly rental properties (Reid 1997a, 2). Many gardens are located close to the homes of gardeners so that they can walk or cycle to their plot (Reid 1997b). Equitable access is also promoted through the development of gardens for people with special needs and their location within communities. The diverse mix of gardeners illustrates the success of this approach; they include participants from day-care centres, handicapped persons, "AIDS sufferers, persons with learning disabilities and those reintegrating into society" (Reid 1997a, 6). Elevated areas for those in wheelchairs or with health problems are available at five gardens and added to any garden sites that request them. Eight garden sites are multicultural in that at least 50 percent of their members come from a variety of cultural backgrounds. In addition, there are 'youth gardens' for children between 9 and 14 years, and one such program is a day camp that offers other natural science activities along with the gardening.

Montreal's Department of Recreation, Parks and Social Development administers the gardens and offers technical support as well as a variety of services. The city provides the land, equipment, and materials necessary for the program to function efficiently. It also repairs the equipment, provides water, collects garden refuse and offers the services of horticultural animators or counsellors as resource personnel. These animators visit the gardens on a rotating basis to give advice to the gardeners (Reid 1997, 3).

Montreal's urban gardens have become integrated into community life. They contribute to the beauty of neighbourhoods, provide a focus for meeting people and sponsor social

events such as corn roasts or community suppers. People from the surrounding areas learn about composting and organic growing techniques that they then incorporate at home. Soup and community kitchens also benefit from the redistribution of excess produce (Reid 1997a, 9).

3.6. Conclusion

Several connections have been made between allotment gardening and sustainable urban development, a societal goal currently being promoted by various United Nations agencies and governments. Cultivating urban allotments is considered to be one way to respond to environmental and developmental issues such as poverty and pollution that are plaguing cities.

These issues can be framed within the theme conceptual model of sustainable development. This model frequently appears in the sustainable development literature and has been used at the local level by some civic governments and civil society organisations to develop indicators of sustainable urban development for the purpose of assessing progress towards this goal.

While there are several other sustainable development conceptual models, the theme conceptual model was chosen as most appropriate for this study as it is relatively easy to apply at the required scale of analysis, and it can reflect local issues and concerns about sustainable urban development. Consequently, this model can readily frame aspects of

allotment gardening relevant to sustainable urban development. Even so, this model is less than ideal, as it does not readily demonstrate the connections between the environmental, social and economic dimensions and the assignment of indicators within each dimension varies among applications.

The Montreal model strengthens the connections between sustainable development, the theme model and allotment gardening. This community gardening system reflects the environmental intent of the City of Montreal while ensuring equitable access to all citizens. Furthermore, trained horticulturists manage the program and assist gardeners to facilitate a successful gardening experience. The Montreal model is used in conjunction with the theme model to guide the development of the conceptual framework and research questions for this study. They are explained in detail in the next chapter on research methods.

CHAPTER 4

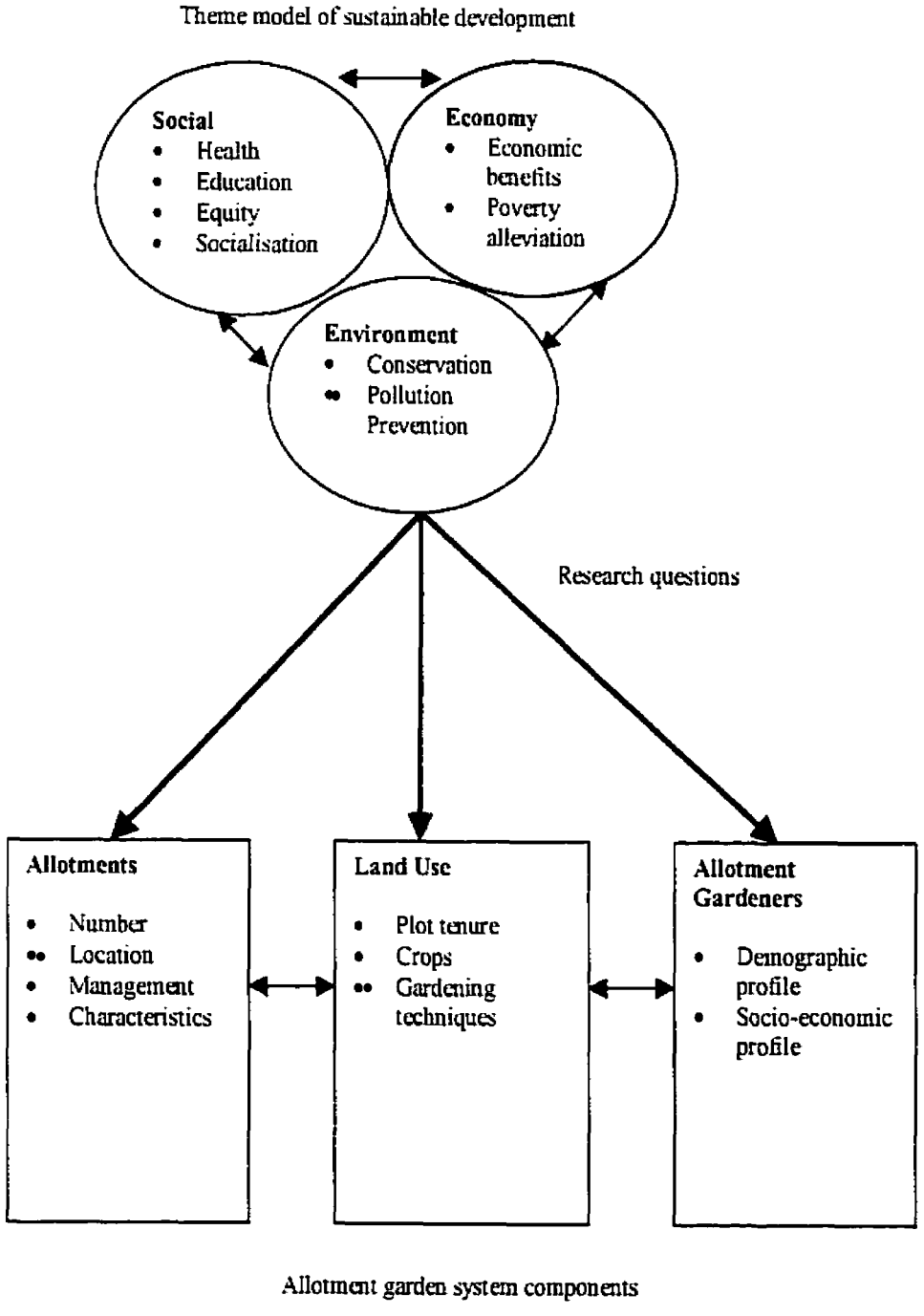
RESEARCH METHOD AND DATA COLLECTION

4.0. Introduction

This study used a qualitative method. Hence the conceptual framework (Figure 1), which is based on the study objectives, is presented first. This framework illustrates the study themes, variables, and their relationships, and a listing of the research questions emanating from them follows.

A qualitative method was chosen, as this study was exploratory and inductive in nature, seeking to promote a better understanding of urban allotments and their role in sustainable urban communities. Even though this was a qualitative study, a structured social survey questionnaire was employed to collect the data. This instrument was chosen because it would allow for the collection of data across a substantial number of gardeners within a limited amount of time, thus allowing for potential comparisons within the sample. In addition, the use of simple univariate counts would enable the researcher to make generalisations across the sample population. Moreover, there were many large garden sites with various owners and managers, and little was known about the similarities and differences between them. Hence, one of the objectives of data collection was to interview enough gardeners at each garden site to allow for some comparison between the various sites.

Figure 1. Conceptual Framework for Study



4.1. Research Questions

Several research questions are used to assess the contribution of Winnipeg's allotments to sustainable development. These research questions are based on the implicit links between allotment gardening and sustainable urban development as made in the literature and, in turn, framed by the theme conceptual model (supra p.44). Appropriate indicators, which would be relevant at the scale of the garden plot and individual, and limited to critical factors, were chosen. As the conceptual framework shows (Figure 1), the research questions and indicators were then used to analyse the data collected on allotment gardens, gardeners and land-use. The research questions, along with a description of their connection to sustainable development and selected indicators, follow.

4.1.0. Research Questions: Economic Sub-Theme

The first two research questions investigate the economic dimension of sustainable development. They consider whether allotment gardening is being used as a poverty alleviation strategy and determine if gardeners are realising any economic benefits by undertaking this activity. The first question, then, focuses on poverty alleviation.

Research Question 1
Do the poor and unemployed cultivate allotment gardens in Winnipeg?

Poverty alleviation strategies have been historically related to allotment gardening, and were the main impetus for their development at the end of the 19th

century and then again periodically in the 20th century during times of need. Allotment gardening in Europe and Canada, however, is now mainly a recreational activity (supra p.24), but with rising urban poverty (supra p.2) this activity is once again being promoted as a poverty alleviation strategy. In addition, poverty alleviation is considered essential for sustainable development (supra p. 35). Thus, this question investigates whether the urban poor in Winnipeg are using allotments as a coping strategy by determining how many are gardening on allotments and comparing this to the proportion of poor in the metropolitan population.

Research Question 2
Do Winnipeg's allotment gardeners benefit economically by producing their own fruit and vegetables?

Another necessary condition for sustainable development is that economic activities should contribute to human well-being. In the case of allotment gardening, the garden produce supplements family food intake and reduces the amount of money spent at the grocery store. For example, Canadian data show that the net gain is $10.00 in returns per square metre in an established garden[10] (Hough 1995, 224). The purpose of this question, then, is to examine the economic benefits to allotment gardeners and their families in Winnipeg and determine if gardening successfully augments their food self-reliance by asking gardeners about their allotment gardening costs and value of garden produce.

[10] Hough intensively cultivated a garden plot in Southern Ontario in the early 1980s to determine economic advantages of growing food on plots. This rate of return is based on this work.

4.1.1. Research Questions: Environmental Sub-Theme

Research Question 3

Do Winnipeg's gardeners employ organic gardening techniques to prevent pollution and promote resource conservation?

Organic gardening methods are often associated with sustainable development, and when such methods are used, soil fertility and productivity are maintained without the use of synthetic chemical fertilisers, pesticides or herbicides (Environment Canada 1992, 3). Instead, composting, animal manure, mulching, crop rotation, biologically fixed nitrogen and cover crops are employed, while pests are controlled through biological pest control and environmentally safe insecticides. Such techniques are considered to be more sustainable as they do not pollute the environment and, in addition, they conserve resources by using closed-looped processes whereby the outputs of one gardening process become inputs for another process: for example, compost and animal manure used to augment the soil. In the case of compost, vegetative debris from one growing cycle is composted and added to the soil to maintain/increase soil productivity for the next growing cycle. This process is optimised when composting is done at the garden site, in which case the compost does not have to be transported. Animal manure, though, is not considered to be as sustainable, as it must be transported from farms to plots thus increasing carbon emissions thought to be contributing to climate change. This research question, then, explores the extent to which

Winnipeg's allotment gardeners use organic techniques, another theme critical in understanding the links between allotments and sustainable development.

4.1.2. Research Questions: Social Sub-Theme

Research Question 4
Is access to Winnipeg's allotment plots equitable?

If development strategies are to be considered sustainable, then they should benefit all members of society. Sometimes social and physical barriers are present that exclude identifiable groups of people. For example, garden plots should be located so that they can be reached by walking or cycling, thereby not preventing those without personal vehicles from also reaping the economic and social benefits of gardening. Consequently, this question explores whether access is equitable by looking at gardener diversity: i.e., level of participation by people from various age, income and ethnic groups; distance of plots from gardeners' homes; methods of transportation to and from the plots; and gardeners' opinions regarding these issues of accessibility.

Research Question 5
Does allotment gardening contribute to gardeners' individual well-being by providing health and education benefits and socialisation opportunities?

Sustainable development also considers those aspects of an individual's well-being that are dependent on supportive social systems and opportunities. Allotment gardening potentially offers many social benefits to gardener participants such as enhanced health

through outdoor activities there also exists the potential to increase individual capacity through increased education, recreation and exercise, the eating of fresh garden produce or socialisation opportunities. This question, then, investigates whether Winnipeg's allotment gardeners receive these social benefits through their gardening activity.

4.2. Questionnaire Design

From the foregoing research questions and indicators, the survey questions were formulated to elicit the necessary data from respondents. Several sources were used to draw up these questions and they included the literature review, studies on assessing sustainable development, and several papers that were presented at the 1997 "International Conference on Sustainable Urban Food Systems", which was attended by the researcher immediately prior to designing the questionnaire. Also, books on questionnaire design and survey methods were consulted to ensure that the questionnaire was appropriately and carefully formulated (Hammond 1978, Nichols, 1991, Spector 1981).

Several aspects of questionnaire design were considered and integrated into the survey instrument, which was to be administered principally through face-to-face interviews. The number of questions was kept to a minimum so as to maintain interest, yet be sufficient to gain the confidence of the interviewees. Most questions were structured (closed questions) with multi-categorial responses that allowed for only one response, so as to facilitate data compilation and ensure comparability among respondents. There

were, however, multiple response questions where necessary. Also, open-ended and opinion questions using a Likert scale were dispersed throughout the questionnaire to add variety and maintain the respondent's interest. There were qualifying questions at the outset with the first section containing several general lead-up questions aimed to put the interviewee at ease. Care was taken to use simple words that were neutral and yet explicit as a means of avoiding ambiguity. In total there were 61 questions. The questionnaire is in Appendix 1.

4.2.0. Questionnaire Structure

The questionnaire was organised into nine sections. Of these, sections one, two, eight and nine elicited information on the gardeners and plot land-use that would provide background information on both gardeners and their plots. In addition, the first section asked questions that would gain the confidence of the respondent. The first question "do you do most of the work on this plot?", was a qualifying question to find out if the respondent would be able to answer most of the questions. Following this were questions about their reasons for gardening, the number of years they had maintained a plot, amount of time spent at the plot, number of plots cultivated, whether they belonged to a garden society and how they first became interested in gardening a plot. The next section obtained details of the plot and its use. Here, questions pertained to the distance of the plot from the gardener's home, and an inventory of vegetables and fruits being grown in 1997. The last section of the questionnaire gathered personal data relating to family income, age, gender, ethnicity, employment and educational attainment. Barriers and

problems experienced by gardeners were covered in questions 50 to 55, and ended with an open question that asked what additional services and amenities they thought plot owners might provide so as to better assist them in their activity.

With respect to the first research question on poverty alleviation, the second survey question on reasons for gardening included a choice " to reduce the family food budget". Other questions relating to this topic were question 59 on annual family income and question 61 on employment. The second research question on economic self-reliance was linked to Section III of the questionnaire, where the economic benefits of allotment cultivation were investigated. These questions focussed on the costs of gardening, the value of garden produce, and how the respondents used their produce. Questions 10 and 13 on perceived costs and value of garden produce were used to determine an economic value for garden crops and, consequently, to ascertain the economic benefits to the gardener. Questions 9, 11 and 12 examined economic benefits to the gardener's family: they enquired about the proportion of the yearly intake of garden produce that comes from the plot, how the produce was used and the number of people in the household consuming the produce.

Sections VI and VII focussed on gardening techniques, and whether the gardeners employed organic methods. All were related to research question three, so that these sections included questions about the application of fertilisers, pesticides and herbicides, water and tool use, and availability of compost bins.

The fourth research question on equitable access was addressed by various questions throughout such as those on age (#57), ethnicity (#58), and annual family income (#59). Question number 36 asked how gardeners mainly travelled to their plots, while numbers 53 and 54 asked gardeners their opinions about access to plots. There were several other questions in Section IV focussing on research question five, which examined social benefits. Here respondents were queried as to how they acquired their knowledge of gardening; whether they had taught anyone else to garden, and if they shared their gardening knowledge with other gardeners. Opportunities to socialise were addressed by questions 20, 25 and 26. Gardening is also associated with individual health benefits, and three questions examined this aspect of the social sub-theme. Question 2 on reasons for gardening included options related to health such as for 'physical activity', mental relaxation or 'nutritious food', while question 23 asked whether or not the respondent considered gardening to be a healthy activity, and question 24 asked about the perceived nutritional value of garden produce.

4.3. Inventory of Allotments

Initially it was necessary to determine the location of all garden sites within the City of Winnipeg and, once achieved, establish how many allotments were being utilised in 1997. From these data a sample could be established. This inventory commenced in June 1997 and continued through to the middle of July. First, a list of garden sites was obtained from three organisations previously identified as landowners that rented plots, namely the City of Winnipeg, Manitoba Hydro and Burlington Northern Railway (now

BNSF Corp.) (the researcher was already familiar with some of the plots rented by these organisations). From the City of Winnipeg, a list of plots with location and number of plots at each site was provided. A Manitoba Hydro spokesperson gave a verbal description of the two locations where they rented-out plots, while an official at the Burlington Northern Railway provided the name and telephone number of the person at the Lindsay Street Garden Club who was responsible for leasing their plots. This garden society was responsible for the administration of Burlington Northern Railway plots.

With this information, some 49 sites were then visited during the last week of June 1997. During these visits, it was noted that many of the plots on the Winnipeg City and Manitoba Hydro lists were directly behind or beside houses so that adjacent homeowners tended to treat them as extensions of their yard. Moreover, many of these plots were not part of larger garden sites. According to a civic spokesperson, some homeowners rented these adjacent plots solely to prevent other people from renting them, and consequently, were not cultivating them. It was estimated that there were approximately 1243 plots available for rent at the time of the inventory. Manitoba Hydro had the most available plots (its spokesman reported having about 400 available that year, although this researcher counted only 53 cultivated plots). Otherwise, Ft. Garry Horticultural Society was the only other organisation with a substantial number of unused plots, having 30 rented out of a potential 100. In addition, the City of Winnipeg had approximately 200 available plots at various locations.

One other garden site, that of the Ft. Garry Horticulture Society gardens, was found during the first phase of the inventory when the researcher was driving around looking for City of Winnipeg plots, while those at St. Amant Hospital were identified later by a gardener during an interview. This raised the possibility that some garden sites had been missed during the inventory process. However, given the familiarity of many of the gardeners with available garden plots in the City and the amount of time spent locating garden sites in various areas of the city, the researcher concluded that the risk of having missed any larger garden sites was minimal.

After making these site visits, it was decided to only survey garden sites that had more than 10 contiguous plots. This decision was made because there was insufficient time to contact and interview a representative sample from all rented plots, which were widely scattered throughout the city[11]. Second, gardeners leasing isolated plots would not be able to respond to questions on social interaction at the garden sites and also regarding shared values and knowledge transmission among allotment gardeners. Third, the majority of gardeners (86 percent) leased plots at the larger garden sites and it was advantageous to concentrate on reaching them as they would be able to respond to the survey questions, which were designed to elicit data on allotments massed at larger garden sites. In addition, their responses were necessary to determine if there were noticeable differences between these larger allotments. Figure 2 shows the location of

[11] There were 618 plots available according to City of Winnipeg records and of these, 411 were rented and 50 were in groupings of less than 10 or single plots.

those garden sites included in the survey.

Only at Optimist Park and Legion Park Gardens were garden plots clearly identified by number; hence for the remainder, individual allotments needed to be numbered on sketch maps so as to identify the number of plots that were being cultivated. Uncultivated plots were not included in the sample, as the researcher could not determine if they were actually rented. The researcher was advised by Winnipeg City and Manitoba Hydro representatives that some people would rent plots, but not cultivate them, often because of loss of initial interest or lack of anticipated time. Figure 3 illustrates how allotments were numbered at St. Charles Grove garden site. The inventory of all allotment sites that met the criteria for inclusion showed a total of 602 cultivated plots (Table 5.0).

4.3.0. Inventory Problems Encountered

Two problems were encountered in doing the inventory. First, it was difficult to locate people responsible for renting plots. For example, the researcher talked with five different people before contacting the person managing the Lindsay Street Garden Club plot rentals. Second, none of the plot owners or garden clubs was able to provide maps of individual garden sites, which meant that plots at most garden sites had to be mapped and numbered by the researcher. It was occasionally hard to determine the number of plots within garden sites, especially as plants were maturing, thereby hiding borders. In addition, cropping patterns were fairly consistent across the majority of plots so that few

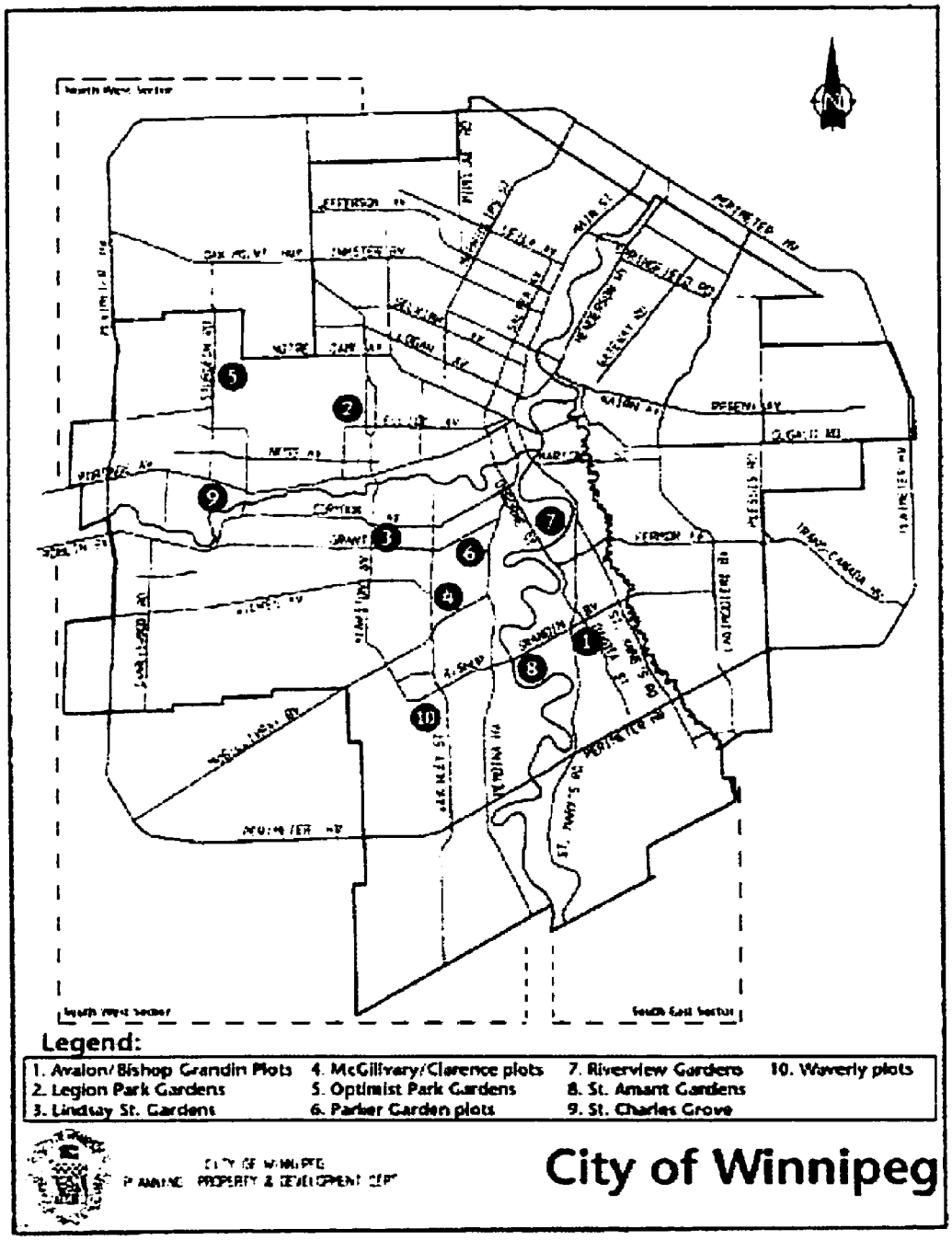
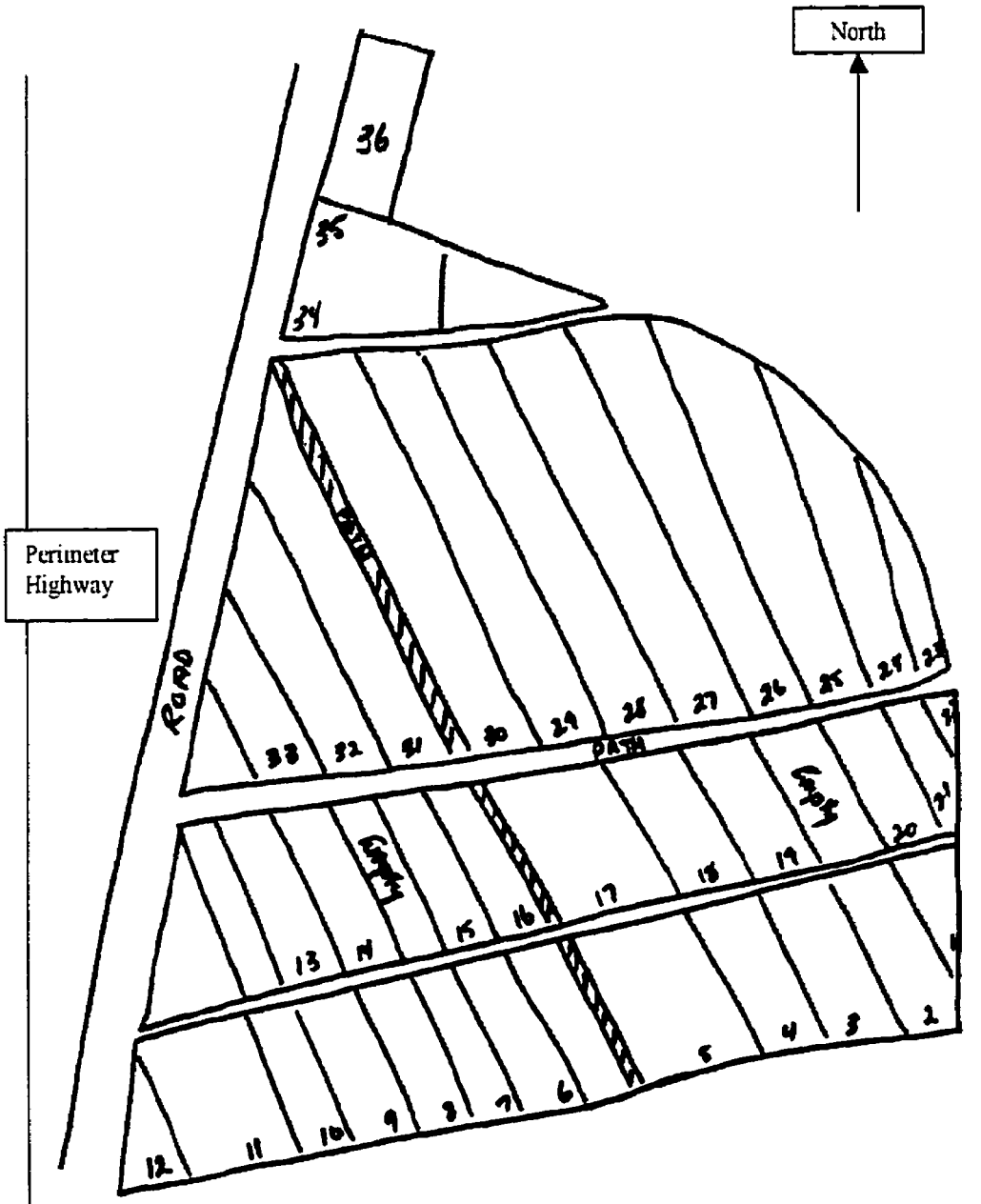


Figure 2
Location of Garden Plots



Assiniboine River

[Not Drawn to Scale]

Figure 3
Sketch Map Showing Numbered Plots at St. Charles Grove Garden Site

had distinct edging material or markings. However, to ensure accuracy sites were re-counted and those renting the plots at these sites were asked about any discrepancies.

4.4. Field Survey

The survey goal was to obtain interviews with at least 10 percent of the gardeners at each garden site, as this would ensure that more than one gardener was interviewed at the smaller garden sites and adequate information collected. Consequently, a stratified sampling technique was used whereby rented plots that were being cultivated were numbered sequentially at each garden site, i.e., each of the garden sites formed a subset of the population, and a random number table was used to select the required number of plots.

To ensure confidentiality when interviewing gardeners, two approaches were tried. The first was to visit the garden sites on a random basis, and interview gardeners from the randomly selected plots when they were at their plots. Unfortunately, this method proved unworkable at that time of the growing season (it was at the end of July when plots required little attention), since there was neither the time nor the opportunity to be at identified plots at times when all the gardeners were present. Thus, a great deal of time was spent waiting for sporadic appearances by gardeners, even though plots were visited at various times during the day when the researcher was on holidays from work to determine when they were most likely to be there.

Consequently, another method was chosen. Letters were left at the randomly selected plots asking gardeners to contact the researcher by telephone to establish a time for an interview. Sixteen percent of the sample population responded to these letters. After interviewing these gardeners, those responsible for renting plots at the five garden sites managed by the garden societies and Manitoba Hydro were asked if they could supply the names and phone numbers of gardeners who were renting the pre-selected plots. In only two cases were they able to match the selected plots with renters. In these cases the plot renters were then contacted and an appointment for an interview made. The majority of these interviews took place during August. This resulted in 23 interviews or 34 percent of the sample population. The remaining 50 percent of the interviews were obtained by visiting garden sites on a random basis in September and early October, in the evenings or during the day on weekends, when gardeners were harvesting and clearing their plots. Interviews were conducted with 67 gardeners (11 percent sample) of which 63 were interviewed in person—either at their plot or home—and four on the telephone (these interviews were given on the telephone at the explicit request of the interviewees).

All gardeners were advised that the questionnaire was confidential given the sensitive nature of some of the information being requested. By stressing the confidentiality of the survey it was anticipated that more reliable responses would be obtained. Everyone who was asked for an interview complied and interviews normally took between 30 minutes and one hour.

The questionnaire met the requirements of the survey as a reliable research tool. The first five interviews were used as the pilot survey because of time constraints and only two questions were dropped, namely number 21 on how gardening has increased specific knowledge and number 32 on whether gardening is a creative activity. One of these questions was redundant and the other appeared to confuse respondents. There were four non-responses to the question on annual family income (question #59). In addition, four plot holders with less than a Grade-Eight education needed to have some of the questions clarified before they could respond.

As the sample was a non-probability sample (only 50% of the respondents were randomly selected), the transferability of the findings to the larger population of Winnipeg allotment gardeners, i.e., ability to generalise, was hampered. The data, however, supported the exploratory intent of the study by providing information on Winnipeg's allotments and for the assessment of their contribution to sustainable development.

4.5. Conclusion

Research questions based on the conceptual framework were designed to assess the contribution of allotment gardening to sustainable community development in Winnipeg, and they consequently focussed on poverty alleviation, economic self-reliance, equitable access to plots, organic gardening techniques and social well-being of gardeners. The

epistemic links between sustainable development and allotment gardening were then established along with sets of appropriate indicators for each research question.
A questionnaire was the primary research tool; design considerations included such aspects as question structure, overall organisation and wording. Multiple questions were included to measure each indicator and connected to the corresponding research question. The questionnaire was given to 11 percent of plot holders.

The breadth of coverage of the questionnaire provided much useful data to explore the allotment-sustainable development interface and supports the inductive, exploratory approach of this study. Before the questionnaire could be applied it was necessary to undertake an inventory of the garden sites and plots to provide background information and determine the sample. Ideally, plot owners would have been able to provide maps and inventories of garden sites under their care along with an accurate number of plot renters, which would have saved much time. This was not, however, the case, and the researcher spent approximately six weeks locating and counting plots, before administering the questionnaire. This meant that much valuable time during the spring planting period was lost. Furthermore, interviews with the gardeners did not start until August, thus leaving just over two months to locate selected gardeners and administer the questionnaire. This process was further hampered because many of the gardeners and the researcher worked full-time leaving only week nights (with diminishing daylight) and weekends for interviews. In addition, the decision to reach 10 percent of the gardeners at each garden site rather than focusing on interviewing a random sample from across the entire sample frame also absorbed more time. Consequently, a probability sample was

not obtained. This meant that findings from the study could not be generalised to the larger population of gardeners, and also reduced their transferability to other settings. Moreover, there was an increased risk of bias in the responses.

Efforts to gather information on each garden site and its gardeners did, however, prove useful. This information, along with that gleaned by the inventory, provided an understanding and profile of allotment gardening in Winnipeg that was not available prior to this study. Thus, a description and explanation of the organisation of the garden sites and their management and allotment culture in Winnipeg follows in the next chapter.

CHAPTER 5

WINNIPEG'S ALLOTMENT GARDENS AND GARDENERS

5.0 Introduction

Little information was available on Winnipeg's allotments prior to this study. The inventory, which was done during the first half of the field season, provided this previously lacking information on garden sites and their management. The questionnaire survey was then used to collect data on the motivations, values and attitudes of the gardeners accessing the plots at these garden sites, so that an understanding of allotment culture in Winnipeg could be built.

The degree to which allotment gardens differed within Winnipeg was not known at the outset of the study. It was initially thought that there would be noticeable differences in cropping patterns as well as motivations and attitudes of gardeners, at least at the larger garden sites, as these sites were located in different areas of the city (Figure 2). This idea was based on the possibility that differences existed between soil types, drainage, water availability and microclimates at the garden sites; hence, allotment crops and cultivation techniques would vary spatially. This thinking also applies to gardeners, as people of similar cultural and socio-economic backgrounds tend to live near each other and are more likely to garden at sites near their homes (Weir 1978). They would then bring their attitudes, knowledge and traditions to the gardening experience, which would affect their crop choices.

At the same time, Winnipeg's allotment gardens are part of and connected to the larger allotment culture out of which they developed. While they are bound to share many of the characteristics of this macro-culture, local nuances shaped by local socio-economic and institutional forces are likely to have emerged. In essence, Winnipeg's allotments occupy both physical and cultural space and their position within these spaces needs to be defined.

5.1. Winnipeg's Allotment Gardens

The allotment garden sites are situated within the urban boundary of Winnipeg. Their location is partially determined by historical settlement patterns and influenced by local land-use, as well as the social institutions that have evolved with them. Even though the number of allotments is not large when compared to other Canadian cities such as Vancouver or Montreal, their institutional landscape is varied along with their management.

Winnipeg is built around the confluence of the Red and Assiniboine Rivers: the Red flows from south to north and the Assiniboine west to east (Figure 2). Prior to European settlement in the 19th century, this region, which is part of the Prairie Ecozone, was predominately open plains covered by tall and mixed grassland with trees and shrubs (poplar, elm, ash, willow, elder, Manitoba maple, oak and cottonwood) being found mainly along riverbanks and in lowlands. "The organically rich, fertile soil overlays

moraine and lake bottom materials provided by glacial Lake Agassiz" and is particularly well suited for agriculture (Manitoba Environment 1997, 17). This landscape has almost completely been modified by cultivation over the last 150 years so that few patches of original prairie remaining (Peters 1988, 1).

The thermal regime ranges from cold winters with daily mean temperatures ranging from −4.7°C in November to −18.3°C in January to warm to hot summers where the daily mean for July (the warmest month) is 19.8°C. There is moderate to minimal precipitation—mean 290.9mm from May through September (Environment Canada 1998). Manitoba vegetables flourish due to good growing conditions: long days and relatively cool nights (Pritchard in Werier 1985). In Winnipeg, there are 115 frost-free days, thus allowing a summer growing season of four to five months (personal communication with Manitoba Agriculture Soils and Crops Division 1998). Over 50 types of vegetables are grown commercially in Southern Manitoba where Winnipeg is located, indicating that a variety of crops can be grown on allotments.

5.1.0. Garden Sites Description

Garden sites are located on the following types of urban green space (Figure 1):

1) Riverbank location: Riverview Gardens, St. Amant Gardens and St. Charles Grove;
2) Utility rights-of-way: Lindsay St. Gardens, McGillvray/Clarence, Parker Avenue, Avalon/Bishop Grandin; and
3) Edge of large fields: Legion Park Gardens, Optimist Park and Waverley Plots.

Table 5.0. Inventory and Description of Garden Sites: June 1, 1997—July 31, 1997

Name of Garden Site	Location	No. of Plots Rented	Owner	Administrator	Dimension of Plots	Annual Rental Fee
1. Avalon/Bishop Grandin Plots	Avalon & Bishop Grandin	15	Winnipeg City	City of Winnipeg	7.5 x 30 m	$15-25.00
2. Legion Park Gardens	Silver Ave. At Lyle St.	102	Winnipeg City	St. James Horticultural Society	7.5 x 30 m	$15-25.00
3. Lindsay St. Gardens	Lindsay St. along Railway Tracks	110	Burlington Northern Santa Fe Railway	Lindsay Street Garden Club	7.5 x 15 m	$20.00
4. McGillvary/ Clarence plots	Hydro right-of-way McGillvray to Clarence	23	Manitoba Hydro	Manitoba Hydro	7.5 x 15 m	$15.00
5. Optimist Park Gardens	Saskat-chewan & Summit Road	65	Winnipeg City	Winnipeg City	7.5 x 30 m	$15-25.00
6. Parker Garden Plots	Ft. Garry - Parker Ave. Between Daniel & Derrick	10	Winnipeg City	Winnipeg City	7.5 x 30 m	$15-25.00
7. Riverview Gardens	Churchill Drive	100	Winnipeg City	Riverview Garden Club	9 x 12 m	$15-25.00
8. St. Amant Gardens	441 River Road	78	St. Amant Hospital	St. Amant Centre	7.5 x 15 (half plots) 15 x 15 m	$15.00 $30.00
9. St. Charles Grove	Portage Ave. At Perimeter	69	Winnipeg City	Winnipeg City– 36 Charleswood Horticultural Society – 33	7.5 x 30 m	$15-25.00
10. Waverley Plots	Waverley near Bishop Grandin	30	Waverley Garden Supplies	Ft. Garry Horticultural Society	9.6 x 12	n/a
Total		602				

Figure 4
Parker Ave. Gardens with fencing to keep out deer—June 1997

Figure 5
Ft. Garry Horticulture Society Gardens—June 1997

Figure 6
St. Charles Grove Gardens—June 1997

Those gardens that are located on riverbanks are subject to spring flooding, which, according to some of the gardeners at these sites, leaves behind silt that enriches the garden soil. While this location is fortuitous for gardeners with riverbank plots, the situation was different for gardeners at some of the other locations. The gardeners on Parker Avenue, for example, had to erect fencing to keep the deer out of their gardens (Figure 3), while those on Waverley were plagued by drainage problems for which they could not find a workable solution. Moreover, two of the gardeners interviewed at Optimist Park gardens were convinced that their plot's soil was contaminated by toxic waste seeping into the gardens from a nearby city landfill.

These garden sites varied in area and number of plots, which tended to be rectilinear in shape, with sizes commonly being 7.5 x 15 m, 7.5 x 30 m or 15 x 15 m (Table 5.0). Photographs of typical garden sites are provided by Figures 3, 4 and 5. Built structures were found only at Riverview Gardens where there were compost bins and at Parker Avenue where there were fences (Figure 3). None of the garden sites had sheds, cottages, play equipment or bathrooms as can commonly occur in Europe. Two sites, Riverview Gardens and Legion Park Gardens, did have one picnic table each. Legion Park and St. Amant plots were the only sites with standpipes. Rental fees were fairly similar for all plots with the City of Winnipeg renting the largest plots for the lowest annual cost at $15.00 each. Most plots are rented out at between $15.00 and $20.00 per year.

Garden sites in Winnipeg most closely emulate those in the United Kingdom in that there is a general lack of amenities at the sites as compared to allotments in Sweden and Germany

(supra p.22). Even so. those in the United Kingdom have permanent storage sheds, which do not exist at Winnipeg allotments. Gardeners noted this lack of amenities and storage sheds during interviews. When asked an open question as to how garden-site owners or garden societies might better assist them, they suggested that the following be provided:

1) water source close to plots
2) compost bins
3) garden shed
4) community roto-tiller/mulcher
5) public washrooms

Garden site tenure did not appear to be the reason for this lack of amenities, as even established garden sites such as Lindsay Street Gardens did not have them. One possible explanation is that plots in Winnipeg tend to be smaller (115-225m^2) than those in Europe where they range from 200-400m^2, thus allowing less room for storage sheds. Another possible reason is that theft and vandalism are pervasive problems at Winnipeg's allotments, which act as a deterrent to erecting structures and leaving tools and so on at the garden sites (infra p.82).

Even though there was a general lack of amenities at garden sites such as public washrooms, compost bins, storage sheds or standpipes that would help gardeners, they did not seem to expect that these facilities should or would be in place. This raises the possibility that those gardeners who are discouraged by problems of theft or lack of on-site amenities simply ceased gardening, thus leaving these problems unresolved.

5.1.1. Garden Site Management

The land on which the plots are situated is owned by five organisations: Burlington Northern Santa Fe Railway; Manitoba Hydro; St. Amant Centre; Waverley Garden Supplies; and Winnipeg City. While Manitoba Hydro and the St. Amant Centre rent plots directly to individual gardeners, the remainder are administered and rented through five gardening societies, with the exception being Winnipeg City. The City rents plots directly to individuals at some sites—Avalon/Bishop Grandin Plots, Parker St. Plots, Optimist Park Gardens and St. Charles Grove—and blocks of plots to garden societies at other sites—Riverview Gardens and Legion Park Gardens (Figure 2).

Plots are administered either by the plot owners directly or through garden societies. There are five active gardening societies that manage 372 plots, or 62 percent of the plots surveyed. These are the Charleswood Horticulture Society, Ft. Garry Horticulture Society, Lindsay St. Garden Club, Riverview Garden Club and St. James Horticulture Society. The role and activities of these garden societies parallels that of garden clubs elsewhere in that they administer and manage plots on behalf of their membership and offer educational programs and social events (supra p. 25). In Winnipeg, these services also include such activities as allocating demarcated allotments to would-be leaseholders and organising garden competitions. In addition, both the Ft. Garry and St. James Horticultural Societies make smaller plots available for children as part of their parent's

membership fees, while Charleswood Horticultural Society offers an educational program on gardening in local schools.

Of the five garden societies, two had recently relocated their plots and, as a result, had lost members. Charleswood Horticultural Society had to move from their Charleswood location to plots at St. Charles Grove, which was across the Assiniboine River. The Ft. Garry Horticulture Society had also moved in the past few years and had only 30 active members at the time of the survey.

Garden site owners that also administered their plots provided only basic services. These included marking plot boundaries, collecting rental fees and in the case of the City of Winnipeg, roto-tilling plots in the autumn. Neither the City of Winnipeg nor other garden site owners offered educational programs or sponsored garden competitions.

Garden managers and owners are in a position to enhance the gardening experience, but instead, may jeopardise its success by neglecting problems. For example, while Manitoba Hydro mows the grass around their plots, apparently it is done sporadically and weeds frequently overrun the cultivated plots. Consequently, rentals have declined. During the interviews gardeners suggested several improvements that they would like, and they include:

1) ensure plots are kept clean
2) correct drainage problems
3) provide security fencing
4) make information on renting plots more accessible
5) designate more land for plots

6) plots to have property tax exemption status
7) ensure plots not rented are kept clean
8) provide long term leases to garden societies
9) encourage organic gardening
10) stop City of Winnipeg employees driving across plots
11) collective seed purchases by gardening clubs
12) better transmission of gardening knowledge
13) provide maps so new renters can find plots
14) control dogs getting into the gardens.

When queried about problems gardeners encountered in both renting and cultivating their plots, the most frequently mentioned problem was theft, with vandalism being listed second (Table 5.1). Most gardeners, however, did not think that there were solutions to such problems as theft and vandalism. According to a spokesperson from the Riverview Garden Society, these problems were perennial and much time had been spent looking for solutions, with the selected and only course-of-action that seemed realistic being to plant more vegetables to compensate for losses.

Table 5.1. Most Frequent Problems Encountered by Gardeners

Problem	% All Gardeners n=46
Theft	45.0
Vandalism	31.0
Drainage	10.0
Lack Co-operation Other gardeners	9.0

Garden sites are dispersed throughout the southwest and northwest sections of the city. They are similar in layout to garden sites in Europe and the United Kingdom in that

numerous rectilinear plots (10 – 110) are grouped at the garden sites. Unlike garden sites in Europe, however, Winnipeg's plots have few, if any garden site amenities. In this regard, they are more similar to allotments in the United Kingdom. The reason that few amenities are offered at Winnipeg allotments is that these gardens evolved at a much later date under different social circumstances than those in Europe. They were mainly started as Victory Gardens and, consequently, have historic links to the United Kingdom. Hence, they do not have the same cultural underpinnings or level of influence as gardens in Europe and the United Kingdom where they are established and legally recognised land-uses. Other reasons are probably the smaller size of most allotments in Winnipeg as compared with those in Europe and the level of theft and vandalism at the plots, which remains unchecked.

Garden sites within Winnipeg varied slightly. Hence, plot productivity also seemed to vary; there were some differences in soils with those on riverbanks receiving the benefits from silt left after spring flooding while others face drainage and possible contamination problems. There was also some variation in garden site management, which would affect plot productivity. Garden societies offered more services to their members than did plot owner-managers, such as ensuring that empty plots and areas surrounding the plots were kept clean. Consequently, gardeners generally encountered fewer problems at sites managed by these garden societies and they received the additional benefit of educational programs.

5.2. Gardener Motivations, Values and Attitudes

According to Crouch (1997) allotment gardening constitutes a unique and shared culture (supra p.24). This study now turns to look at the extent that Winnipeg's gardeners share the motivations, values and attitudes of this culture.

5.2.0. Reasons for Gardening

Gardeners were asked to give their reasons for gardening and the responses were subsequently organised into 10 categories that had been derived from the literature review. They are as follows:

- outside recreation/hobby;
- reduce family food budget;
- mental relaxation;
- nutritious food;
- physical activity;
- organic produce;
- family tradition/custom;
- meeting other people;
- family activity; and
- creative activity.

From the respondents were added two others; namely, "source of fresh vegetables" and "like to see things grow" (Table 5.2).

The most frequently cited reasons for gardening given by the gardeners were:

1) as an outdoor recreation or hobby;
2) for the fresh vegetables;
3) reduce the family food budget

The main reason for gardening given by 70.2 percent of respondents was for "outside recreation/hobby", while only 19.4 percent gardened to reduce the family food budget.

Table 5.2. Reasons for Gardening

Reasons	**% all Gardeners** n=67
1. Outside recreation/hobby	70.2
2. Source fresh vegetables	37.3
3. Reduce family food budget	19.4
4. Mental relaxation	17.9
5. Nutritious food	16.4
6. Physical activity	13.4
7. Organic produce	13.4
8. Family tradition/custom	9.0
9. Meeting other people	6.0
10. Family activity	6.0
11. Creative activity	1.5
12. Likes to see things grow	1.5

As the literature review revealed, people mainly garden today as a form of recreation and for organically grown food (supra p.24). While most Winnipeg's gardeners also gardened for recreationally purposes, few were motivated by the desire for organically grown food. Hence, Winnipeg's allotment culture differs somewhat from that of the larger allotment culture as defined by Crouch (1997) and others. One apparent explanation for this difference is that few of the gardeners in the sample practised organic

gardening (8%) and organic methods did not generally seem important to the others. It should be noted, however, that over 90 percent of gardeners in the Winnipeg sample thought that gardening improved the local environment. This suggests that environmental awareness exists in the group, but that the finer points of managing this environment have not been internalised. The reasons for this lack of interest in organic gardening are more fully explored in Chapter 6 (infra p.103).

Further information on gardener's motivations and attitudes was gathered by posing statements to them and measuring their responses using a five-point Likert Scale (Table 5.3). This exercise divulged some discrepancies between attitudes towards gardening and the reasons for gardening. Only nine percent reported gardening because it was a family tradition, yet 60 percent strongly agreed with the statement that "gardening was a tradition in their family". Similarly, 67 percent strongly agreed with "food from my garden is more nutritious than food from the grocery store", while only 16 percent stated that they grew their own vegetables and fruits as a source of more nutritious food.

The reason for these discrepancies was most likely because of the way the survey questions were posed. When questioned about reasons for gardening, each possible reason in the list was not given; i.e., gardeners were not prompted verbally, and the researcher noted only unprompted responses. This approach was purposeful, as the researcher wanted to capture the dominant reasons for gardening and, as they would most likely be the strongest motivators, would be easily recalled. Alternatively, when the attitudinal questions were given, recipients were given a statement such as "In your family, gardening is a tradition"

and asked the extent to which they agreed or disagreed with that statement. Hence, this more direct approach cued the survey recipient and helped them recall this information.

In addition to valuing garden produce because it was considered more nutritious, the majority of gardeners considered gardening to be a good way to connect with nature, a finding similar to that other researchers such as Garnett (1996b) (supra p.24). Table 5.3 gives a complete list of the attitudes of Winnipeg's gardeners towards gardening.

Table 5.3. Gardener Attitudes towards Gardening

Question	% Strongly Agree	% Agree	% Neutral	% Disagree	% Strongly Disagree
Gardening is a good way to connect with nature.	73%	21%	6%	--	--
Gardening is a healthy activity.	90%	10%	--	--	--
Food from my garden is more nutritious than food from the store.	67%	12%	18%	3%	--
In your family, gardening is a tradition.	60%	30%	2%	7%	1%
It is important to me that my garden looks pleasing.	64%	20%	4%	12%	--
The gardens are important to the identity of the local community.	37%	27%	15%	19%	--
Gardening is a good way to maintain family bonds.	37%	40%	10%	12%	--
Gardening is a good way to improve the local environment.	67%	27%	6%	--	--

A vital component of allotment culture is what Crouch (1997) termed 'the gift relationship': the giving of seeds, produce and plants to others (supra p. 26). One aspect

of this gift relationship was explored in this study, that of gifting plot produce to others. In the Winnipeg sample, only one gardener did not gift any produce. The others mainly gave to friends and neighbours (82.0%) and relatives (58.2%), while 30 percent gave to charities with 18 percent naming Winnipeg Harvest, a local food bank, as the charity to which they gave.

5.3. Land-Use Patterns

Physical aspects of cultivation such as plot location, soil and drainage influence crop choices. In addition, gardeners bring their attitudes, knowledge and traditions to the gardening experience, This was certainly the case in Montreal where ethnic gardens are common and cropping patterns reflect this diversity (supra p. 46). In addition, the majority of gardeners in Winnipeg were experienced: they had been gardening for 12 years on average and usually at the same garden site. Consequently, they would have adapted to local growing conditions to some extent. Some spatial variation in crop selection is therefore expected especially as the larger gardens are located in different areas of a city.

5.3.0. Crops Grown

Gardeners reported growing a total of 46 different types of vegetables and fruits. The most popular ten were: beans, tomatoes, potatoes, carrots, onions, peas, corn, cucumber, beets and zucchini. Vegetables were more prevalent, with tomatoes being the most

popular fruit. Table 5.4 lists vegetables and fruits grown along with the percentage of gardeners growing each.

Table 5.4. Vegetables & Fruits Grown by Gardeners in Order of Frequency

Vegetable/Fruit	% Of Gardeners n=66
Beans	90.9
Tomatoes	84.8
Potatoes	83.3
Carrots	74.2
Onions	74.2
Peas	74.2
Corn	69.7
Cucumber	68.2
Beets	62.1
Zucchini	48.5
Peppers	40.9
Pumpkins	36.4
Lettuce	33.3
Cabbage	30.3
Squash	28.8
Broccoli	28.8
Turnip	18.1
Radishes	18.1
Chard	18.1
Cantaloupe	16.7
Cauliflower	13.6
Watermelons	10.6

Other vegetables/fruits grown by less than 10 percent of the gardeners included: melons, celery, spinach, garlic, parsnips, raspberries, strawberries, rhubarb, eggplant, brussel sprouts, leek, kohlrabi, golenberry, sandberry, grapes, huckleberry, blackberries, bok choy, kale, peanuts, snow peas, scallions, marrow, okra.

It was assumed that the gardeners' cultural backgrounds and different locations of the garden sites would result in a wide variety of vegetables and fruits being grown and that their prevalence would differ spatially. As the data in Table 5.4 shows, few of the crops represent ethnic choices such as are now commonly found in some of the large grocery stores. Instead the most common vegetables in the list consist of vegetables that have historically been grown on the Prairies. Indeed a list of vegetables listed by the

Experimental Farm in Indian Head in 1890 includes beets, beans, carrots, corn, cucumbers and onions with other vegetables grown at this time being peas and potatoes (Western Canadian Society for Horticulture 1956, 73). While many early varieties brought from Europe and the United Kingdom were subject to failure in Winnipeg's harsher climate, improved strains gradually took over and endured (Western Canadian Society for Horticulture 1956, 73). Many of the gardeners in the study sample were Canadians of British or Western European descent with a rural background and had been taught to garden by grandparents and parents. Therefore, it can logically be concluded that they would continue to grow crops with which they are familiar and knew to be hardy. Furthermore, much transmission of knowledge takes place at the garden plots and this would undoubtedly include information on what to grow. Indeed, a gardener from Antigua substantiated this assumption: she found gardening in Winnipeg to be completely different from Antigua. She has had to re-learn how to garden and is taking advice from her fellow gardeners on what to plant.

Also of interest was whether crop choice differed between garden sites. It was assumed that local growing conditions would render some choices more viable than others would. There was not, however, a statistically valid sample from each of the garden sites upon which to base such a comparison. Nevertheless, the percentage of gardeners growing the 10 most prevalent vegetables (including tomatoes) at the three largest garden sites were compared to determine if some variation might exist thus indicating that further research was required (Table 5.5). These garden sites were chosen for two reasons: first, they are located in

different sections of the city and second, they represent more than fifty percent of the total sample.

Table 5.5. Percentage of Gardeners Growing Vegetables & Fruits at Three Largest Garden Sites

Vegetables	% Gardeners Growing: Lindsay	% Gardeners Growing: St. James H.S.	% Gardeners Growing: Riverview
Beans	92.0	90.9	100
Tomatoes	100	100	72.7
Potatoes	66.6	72.7	90.9
Carrots	75.0	81.8	72.7
Onions	75.0	72.7	54.5
Peas	83.3	45.5	100
Corn	58.3	54.5	63.6
Cucumber	66.6	63.6	81.8
Beets	58.3	90.9	63.6
Zucchini	58.3	54.5	63.6

The data show enough differences to suggest that further research that would be beyond the scope of this study is needed. For example, Riverview gardeners grew fewer tomatoes than the other two groups, but substantially more peas than the St. James Horticulture Society gardeners did. While these differences may be by chance because of the small sample sizes, they do suggest spatial variation does exist to some extent.

While crop choices reflect the cultural background of the gardeners and traditional vegetables and fruits that have been grown in the Winnipeg region over the past century, there is little variation in types of crops grown. The reason for this is probably because the majority of gardeners are Canadians of British or Western European descent. There is, however, some discernible differences between the number of gardeners growing these crops at the largest garden sites indicating that plot location has some bearing on crop choices.

5.4. Conclusion

Allotments in Winnipeg are most similar to those found in the United Kingdom in that they consist of number rectangular plots that are rented to gardeners on an annual basis. Furthermore, many are managed by garden societies, which offer a range of services to the membership. This link to allotments in the United Kingdom is historic, as British immigrants probably brought this activity to Canada. Moreover, the horticulture societies, which started some of Winnipeg's allotments during World War II, are also historically linked to Britain.

Generally plots in both Winnipeg and the United Kingdom lack on-site amenities. There is, however, one notable difference, and that is the lack of plot storage sheds in Winnipeg, a feature that is common in the United Kingdom. This lack of on-site amenities such as storage sheds is the result of local conditions; plots are usually smaller in Winnipeg and allotments here do not enjoy the same level of political clout or currency

in the community that they do in Europe and Britain. Therefore, land tenure is less secure and it is more difficult to get municipal authorities to invest in garden site improvements.

Winnipeg gardeners are also motivated by some of the same values and hold some similar attitudes to gardeners elsewhere. They garden mainly as a form of recreation and like to connect with nature. They do, however, diverge from other gardeners in that few of them garden for the organic food and their level of interest in organic gardening methods was generally low.

Even though garden sites in Winnipeg were dispersed throughout the city, their terrain was generally flat and growing conditions similar. There were, however, some small differences that would affect plot-scale-growing conditions. For example, trees sheltered plots at the riverbank garden sites and at one site there was enough of a slope to affect drainage. Furthermore, spring flooding impacted on the length of the growing season and soil fertility at these riverbank plots.

It was expected that local growing conditions and culture would influence the choice of crops by gardeners. This was, indeed, the case, as the majority of gardeners chose traditional crops that have historically been grown in the Winnipeg region, which also reflected their British and Western European heritage. It also illustrates the inter-generational transmission of knowledge, as many of the gardeners in the sample had rural backgrounds and had been taught to garden by family members. When crop choice was

compared at the three largest garden sites, some differences did emerge, which suggested spatial variations exist based on local growing conditions.

Clearly, Winnipeg's allotments play a positive role in the community, by providing green space and opportunities for beneficial outdoor recreation. In addition, they are part of Winnipeg's heritage and are linked to allotment culture elsewhere. The extent of their contribution to sustainable urban development, however, is not evident, and this question will be explored next.

CHAPTER 6

CONTRIBUTIONS OF WINNIPEG'S ALLOTMENTS TO SUSTAINABLE DEVELOPMENT

6.0 Introduction

The previously designed research questions, which were framed by the theme model of sustainable development, are now used to assess the contributions of Winnipeg's allotment gardens to sustainable development. These research questions explore five aspects of sustainable development that were linked to allotment gardening (supra pp 51-55) and, hence, fall within one of the environment, social or economic sub-themes. Consequently, issues critical to sustainable development such as poverty alleviation, access to services, and good environmental practices are examined. When considered together, these issues then provide some indication of the extent that Winnipeg's allotment gardens support sustainable urban development.

6.1. Economic Aspects

The economic sub-theme includes aspects of wealth generation and material prosperity, hence, the contribution of allotments to these issues is considered. While deriving economic benefit is important to sustainable development, the Brundtland Commission had placed a renewed emphasis on decreasing poverty (supra p.35). Both of these economic aspects of sustainable development focus on the opportunities available to individuals to meet their basic needs and garner the productive assets necessary for a secure quality of life.

6.1.0. Poverty Alleviation

The indicator chosen to determine whether Winnipeg's allotments were being used to alleviate poverty was the number of poor households renting plots. The definition of a 'poor' household was derived from two sources: the Acceptable Living Model, and the Statistics Canada "low income cut-offs". Survey data revealed that 25.5 percent of the surveyed gardeners had annual family incomes of less than $31,000.00; the minimum income needed to support a family of three according to the Acceptable Living Model, while the Statistics Canada "low income cut-offs" for 1996 for a four-person household is $32,238.00 per annum. (Gardeners reported on average that there were four people in their households eating garden produce.)

The number of poor households renting plots, however, did not provide enough information to draw any conclusions about poverty alleviation, as the information on what would be considered a significant number of plot renters from poor families and the critical range within which it would fall were not available. To put it another way, it was not known what number of poor plot renters was too few so as to conclude that plots were not used for poverty alleviation. This dilemma was partly solved by comparing the annual family income of gardeners to that of all families living in the three sections of the City where allotments are located (Figure 2). If the proportion of poor families renting plots was similar to the proportion in the greater population then the argument that plots were used as a poverty alleviation strategy would be substantiated in part. Table 6.1 compares gardeners' annual

family income from the sample to Winnipeg residents (data are from the 1996 census) in the three sections of the City.

By comparison with the population at large, these data show there were more gardeners in all income categories except under $10,000.00 and over $50,000.00, with 25.5 percent of the sample falling under the poverty line as compared to 19.6 percent for these specific sections of Winnipeg's population (Table 6.1). Hence, it may be inferred that allotments are providing an element of poverty alleviation;

Table 6.1. Gardeners Annual Family Income Compared to Winnipeg Families in Areas where the Gardens are Located

Income Categories (1996 Canada Census)	% Winnipeg families (NW, SW & SE Sections**) n=81,765	Income Categories (survey)	% Gardener n=63*
Under $10,000	3.4		0
$10,000-19,999	6.0	$10,000-20,00	8.0
$20,000-29,999	10.2	$21,000-30,00	17.5
$30,000-39,999	11.8	$31,000-40,00	19.2
$40,000-49,999	12.9	$41,000-50,00	15.4
Over $50,000	55.5	Over $50,000	26.9
N/A	--		6.0

*four respondents did not answer the question on their income category
**Figure 1 defines these sections of the City

however, other data cast doubt on such an inference. Only 19.4 percent of the gardeners gave "reduce the family food budget" as one of their main reasons for gardening. Moreover, only two respondents with family incomes of less than $30,000.00 per year gave this as a reason for gardening. When employment data

are considered they did not reveal any unemployed gardeners. These data showed 48 percent were retired, another 17.9 percent were either part-time employed or homemakers, and 34.0 percent were fully employed. All of the gardeners had sources of income, which suggests that they were not dependent on garden produce to meet their basic food needs.

The case could also be made that if allotments were being used to alleviate poverty, they would be located in those areas of the City that have the highest percentage of lower-income families, thereby being more accessible to a greater proportion of the poor. This, however, was not the situation in Winnipeg, as all garden sites surveyed were either in or bordering middle-income areas. Furthermore, vacant land for garden sites was available in lower-income areas in 1997 when this research was done. At this time, the City's 'Green Teams' initiative[12] hired students to develop and organise garden sites, and a Winnipeg Community Gardening Network had been formed. There were seven garden sites listed, each with less than 10 plots (they were not included in this study), and all were located in areas with a higher concentration of lower-income families, according to Sarah Koch-Shulte (1997), one of the organisers.

One of the differences between community and allotment garden models is their underlying purpose. Whereas community gardens are frequently started with poverty alleviation being their primary goal, allotments, at least in Europe and Canada, are mainly perceived as a

[12] Community groups could apply for funding to hire high school and university students to undertake projects with improving the environment as a goal.

source of recreation even if their history would suggest otherwise. In Winnipeg, allotments had started during World War II as Victory Gardens (supra p.18), and again in the 1980s during the rise of environmentalism, and were not motivated by poverty alleviation from the outset. Here, allotment gardening appears to be an affordable past-time for lower- to middle-income earners rather than serve as a way to alleviate poverty.

6.1.1. Economic Benefits

As garden produce supplements family food intake, it reduces the amount of money spent at grocery stores on such commodities. In addition, the sustainability of food production on allotments depends on whether it is economically successful, since it is assumed that people would be more likely to continue gardening if benefits exceed costs. To determine these economic benefits, gardeners were asked to estimate how much it cost to grow plot produce, inclusive of rent and any inputs (not including their labour) (Table 6.2), and to "guesstimate" the value of this garden produce that was used at home in the past year (Table 6.3).

Sampled gardeners, who responded to these questions, generally provided only estimates of their costs and revenues, so that the difference between the means for Tables 6.2 and 6.3 indicated that the family food budget was reduced by $148.03 per year, with one respondent not responding to the cost of plot cultivation and a further 17.9 percent not determining the value of the produce used in the home. These individuals were unaware of the amount to which the family food budget was reduced.

Table 6.2. Annual Cost of Gardening

Costs	No. of Gardeners	Costs—all Gardeners ($)
Less than $50.00	19	(25 x 19) 475.00
$50.00 to $100.00	33	(75 x 33) 2475.00
$100.00 to $200.00	14	(150 x 14)2100.00
Over $200.00	none	--
Non-responses	1	
Total	67	5050.00
Mean		(5050/66) 76.52

Table 6.3. Estimated Value of Garden Produce used in the Previous Year

Value of Produce Last Year	No. Gardeners	Total Value ($)
Less than $50.00	4	(25x4) 100.00
$50.00 to $100.00	8	(75x8) 600.00
$100.00 to $250.00	28	(175x28) 4900.00
$250.00 to $500.00	12	(375x12) 4500.00
Over $500.00	3	(750x3) 2250.00
Not Known	12	
Total	67	12350.00
Mean of those Known		(12350/55) 224.55

There were two respondents who had calculated costs and revenues from their plots and only one was willing to provide their figures. She had valued her garden produce at over $1,000.00 per year and costs between $100.00 and $200.00. The second person was the only sampled gardener who sold produce from his plot, and he was not prepared to divulge the revenues from these sales. In general, most gardeners were not concerned with the economic aspects of their activity, since they had neither calculated costs nor

revenues and believed they could not accurately estimate the value of their produce. This lack of interest in economic gain indicates that the benefits of allotment cultivation for most gardeners are probably non-monetary, and this conclusion is supported by responses given to the query on the main reasons for gardening. Here, just over 70 percent gave their main reason as "recreation/outdoor hobby", and as previously stated, only two respondents earning less than $30,000 per year said that they gardened to reduce the family food budget. It is noteworthy that even those with annual family incomes under the poverty line were no more aware of costs and revenues than the higher-income gardeners; therefore, allotment gardening is probably not a poverty alleviation concern.

Financial gains, however, are obviously there for those who are willing to put in the effort. Two researchers who have tracked costs and revenues support this claim. Hough (1995, 224) calculated that the net gain for urban plots in Canada was $10.00 per square metre:[13] with most Winnipeg plots being 112.5 or 225 square metres, this implies a potential gain of $1125.00 – 2250.00. To determine the accuracy of Hough's calculation another source was found: Hynes (1996, xiv), who states that "today a 15 x 15 foot plot, intensively gardened can produce up to $500.00 (USD) worth of food over one growing season". This equals 21 m^2, and when compared to Hough's calculation is more than twice as high: $2500.00 – 5500.00.

[13] Hough's calculation is based on an intensively gardened plot cultivated over a several years in the 1980s.

The gardener in the sample who had calculated the value of her garden produce estimated her annual garden revenues to be over $1000.00. She also seemed to garden more intensively than most. She was very diligent at keeping garden productivity maximised through the use of soil inputs and garden maintenance. Furthermore, she canned or froze most of her produce so that little spoiled.

It would seem on the basis of the above examples that gardeners in the sample are under-estimating the value of their gardening efforts and, in general, do not reap the gains possible from their plots. The economic benefits are there, but not fully realised. This could partially be explained by the fact that a wide variety of fresh vegetables and fruits are readily available in Winnipeg at a reasonable cost, especially in the summer and fall. Hence, there would be little incentive for gardeners to invest more time and money in plot cultivation. This lack of knowledge about how to realise the full productivity potential also lends support to the conclusion that allotment gardening is not a poverty alleviation strategy. If so, then those looking to realise economic benefits would be more likely to determine if they were succeeding.

Lower-income gardeners in the three sections of the City where the allotments are found appear to be taking advantage of their presence, as they are well represented among the sample. Few of these low-income gardeners, though, cultivated plots to reduce the family food budget; most gardened as a form of recreation. Furthermore, plots were not located in areas of the City with high concentrations of low-income earners, which suggests that allotments were not perceived as a poverty alleviation strategy. In addition,

gardeners were not realising the full economic benefits of their plots. Hence, the view that allotments are mainly an affordable past-time for lower- to middle-income earners is supported. As such, they contribute to the quality of life of the gardener participants, but are not a poverty alleviation strategy.

6.2. Environmental Aspects: Organic Cultivation Techniques

Another necessary condition for sustainable development is that ecosystems, which provide life-support systems, be viable and healthy. To maintain ecosystem integrity, resources can neither be removed faster than they can be replenished nor wastes returned to them faster than can be assimilated. Indicators linking allotment gardening to this aspect of sustainable development include the use of organic fertilisers such as: compost, manure and dug-in vegetative debris, which are by-products of gardening and farming cycles that are being reused, and the use of non-polluting methods for pest and weed control. On-site composting is considered optimal as it does not have to be trucked to the garden sites, thus reducing carbon emissions (supra p. 53). Thus, gardeners can contribute to ecosystem health by practising non-polluting and conserving cultivation methods, thereby reducing the total impact of their activities on the environment.

The use of organic methods to enrich the soil, which are not mutually exclusive, such as composting (used by 25.4 percent), manure (used by 20.9 percent) and dug-in debris (used by 30.8 percent) was quite low among the sample, and an additional 14.0 percent of gardeners did not think it necessary to use any method at all. Of these, many were

cultivating plots along the river (St. Charles Grove, Riverview and St. Amant) where spring flooding often occurred, thus leaving behind fresh alluvial which enriched the soil to the extent that soil additives were not necessary.

Plot owners and managers responsible for looking after the majority of plots did not encourage organic gardening. In some cases they had established policy that worked against their implementation. For example, some gardeners reported that the City of Winnipeg would not allow them to install compost bins because the City had received a complaint from a nearby homeowner that such bins were unsightly (personal communication, Charleswood Horticulture Society). Only Riverview Gardens had compost bins and these did not appear to be used. By comparison, in Montreal composting is encouraged; the city distributes composted leaves each year to the gardens and encourages the use of on-site composters where volunteers are available to manage them (Reid 1997a, 2).

Dug-in debris, whereby some crops and crop residue is tilled into the soil at the end of the growing season, was also utilised by over 30 percent of those sampled. Gardeners on City of Winnipeg and Lindsay Street Garden Club plots reported, however, that they were required to remove all vegetative debris from their garden plot at the end of the season so that plots could be tilled, which consequently precluded the use of dug-in debris. Most respondents who used dug-in debris belonged to garden societies, with only 4 gardeners (6.0 percent) from Winnipeg City Plots using this method of soil enrichment. Such evidence indicates that the City policy of requiring the removal of all vegetation at the end of the growing season was effective at discouraging use of this method.

Only nine percent of respondents applied chemical herbicides; most controlled weeds through non-polluting methods such as hoeing and handpicking. Pest management, however, was approached differently. Here, 63 percent used chemical pesticides, with the remainder controlling insect pests through natural methods such as integrated pest management and environmentally safe insecticides. The potato beetle was the most prevalent and invasive pest reported by gardeners. Three of the interviewees were trying biotech potatoes that had been genetically altered to be pest resistant. Though potato beetles had not invaded them, one gardener, who had already harvested some of these potatoes at the time of the survey, stated she did not like the taste or texture and doubted if she would grow them again. Some gardeners decided not to grow plants subject to insect infestation such as corn, cauliflower and potatoes, and one inventive gardener used whole-wheat flour to dust his potatoes, which he found to be effective in reducing potato-beetle infestation.

Generally, there was a lack of interest and knowledge about organic methods. Indeed, there were only five gardeners who said that they were "organic gardeners" and few gardeners said that they gardened to obtain the organic produce (supra p. 83). One possible reason for this lack of interest and knowledge may be that much of the gardening knowledge is passed on between gardeners and through the garden societies. As the majority of gardeners are over the age of fifty-five, they may not be aware of how to garden organically. Howe (1999) noted that organic methods were mainly used by younger and newer gardeners (supra p. 27). Another possible reason is that there is little

motivation to garden organically, as the City does not have any regulations in place to encourage it, such as in Montreal, and gardeners do not consider it important to institute such practices themselves. As few gardeners practice organic methods, it can be inferred that any benefits of doing so are not apparent to them or that the risks and costs of organic gardening are more than they are willing to bear.

6.3. Social Aspects

Allotment gardening is associated with many social benefits such as increased individual well-being and health, socialisation opportunities and the positive feelings that come from mastering skills. These benefits, though, need to be accessible to everyone, and this notion of equity is central to sustainable development (supra p. 34). Equitable access to allotment plots provides opportunities for those wanting to access land for growing food as well as enhancing one's quality of life. Moreover, individual well-being is a necessary condition for vibrant, healthy communities (supra p.40).

6.3.0 Equitable Access to Plots

Indicators for equitable access used in this study include the distance of available plots from homes, how gardeners mainly travel to their plots, and the socio-economic and ethnic diversity of gardeners. The choice of these indicators is based on the assumption that the location of the plots influences, to some extent, both the range of representation from different socio-economic groups and the number of gardeners who cultivate them.

Of those surveyed in Winnipeg, 22.7 percent reported that they lived within 0.5 km of their rented plot, and an additional 15.1 percent lived within 1km (1km equals approximately 7 city blocks)[14]. That the majority of gardeners need to travel more than 1 km to their allotments reflects the fact that most garden sites are not located in residential neighbourhoods. Hence, many gardeners must drive, cycle or take a bus to get to and from their plots.

Some people, such as the elderly, disabled and those under the age of 16, cannot drive personal vehicles to garden plots and, consequently, depend on other sources of transportation like public busses or other drivers. Thus plots are less accessible for them. To determine whether plots were located so they could be reached by walking or cycling, thereby making them more accessible, gardeners were queried as to how they principally travelled to and from their plots. The majority—65.7 percent—reported using their personal vehicles, 22.4 percent walked, 9 percent cycled and 3 percent mainly used public transit. In total, 31.4 percent of gardeners surveyed walked/cycled to their garden plot; this number being slightly less than the 37.8 percent who reported living within 1 km of their plot. Some gardeners, of those who said that they mainly walked, did report driving their vehicles to transport tools, since facilities for tool storage were not available at the plots. Some also

[14] The researcher drove the length of several city blocks to arrive at a mean of 7 blocks equalling 1 km.

hauled water to their plots in vehicles because only two garden sites, namely St. Amant and Legion Park Gardens, had standpipes.

From among those in the sample, one gardener took the bus, and this was an elderly lady who had gardened at the same Manitoba Hydro site for 27 years. As her plot was near a row of houses, she had become friendly with a few of the nearby homeowners who also gardened and could call upon them for water and tool storage, if necessary.

Another indicator of equitable access to garden resources is the diversity of the participants. If plot access were equitable, then gardeners would reflect the different demographic, ethnic and socio-economic backgrounds represented by the larger population in their neighbourhoods. Consequently, data were analysed for diversity of age, income and ethnicity.

Gardeners in the sample ranged in age from 30 to 76, and were relatively evenly dispersed among the age cohorts. The smallest number was found in the age 30 to 39 category with 16.4 percent, while the largest number, 23.9 percent, were between ages 60 to 69. The mean age for all gardeners was 55.6 years. There were substantially more gardeners between ages 50—69 as compared to the general population (Table 6.4). Two garden societies did run special programs for children (supra pp 78-79). There were no young adults ages 15—29 in the sample.

Table 6.4. Ages of Gardeners Compared to NW,SW, SE Sections of Winnipeg

Ages	% NW,SW,SE Winnipeg individuals (1996 Census) n=269960	% Gardeners n=67
15-29	22.1	--
30-49	34.3	34.3
50-69	18.5	44.8
70+	9.4	20.9

This lack of participation by young adults was also noted in Montreal. In that city, about 50 percent of the gardeners were 55 years of age and older, with few between the ages of 18 to 25; though according to Reid (1997b, 6), there was a slight increase in participation from this age group in Montreal's centre-town gardens. There are several possible reasons for this lack of participation by this age group. Gardens may not be located near rental accommodations where young people are more apt to live or they may not perceive gardening as a desirable activity. The former reason seems more likely, however, as a community garden established in 1996 and 1997 in the Osborne Village area, which has mainly rental accommodation and a large population of young adults, had a high proportion of gardeners from this age group (Koche-Schlute 1997,8). Other reasons could include having other priorities such as obtaining an education, establishing a career or many could still be living at home.

A higher proportion of gardeners over the age of 50 than that in the general population indicates that allotment gardening is an activity favoured by those in this age group. There could be several reasons for this: many respondents reported that gardening was a family tradition, and this was supported by the data; all but four gardeners over 50 years of age responded favourably (agreed or strongly agreed) to the statement that "gardening was a family tradition". Furthermore, approximately 80 percent from this group reported they had been taught to garden by parents and many maintained that they learned to garden while living on the farm and had continued this activity when they moved to the city. Another possible reason for the prevalence of gardeners in this age group is that they may have more time, as families and careers require less time. Indeed, 48 percent of the sample were retired and another 17.9 percent were either part-time employed or homemakers, leaving 34.0 percent fully employed.

Annual family incomes of gardeners were compared to those of families living in the NW, SW and SE sections of Winnipeg in Table 6.1 (supra p. 95). As indicated, there are slightly more gardeners in all categories except those earning less than $10,000.00 and more than $50,000 per year. The questionnaire did not provide "less than $10,000.00" (first category in the questionnaire was less than $20,000.00) as a response category, which explains the absence of any gardeners being listed there. At the other end of the income scale, fewer gardeners as compared to the general population reported earning over $50,000. This finding suggests that allotment gardening is not a recreational choice of higher-income earners rather than an access issue. This assumption was not tested, though, and is based on the notion that higher-income earners would be able to afford

transportation and make other affordable lifestyle choices such as owning a summer cottage or travelling. The fact that gardeners were represented in all income categories infers that access is equitable.

Alternatively, there is little ethnic diversity among gardeners in Winnipeg. Just under ten percent of the respondents were not born in Canada: countries of birth were Antigua, England, Germany, Greece and Italy. Only the Greek and German gardeners considered themselves to be members of an ethnic group, while the Antiquan belongs to a visible minority. This level of participation by visible minorities does not reflect the ethnic diversity in the city as a whole where just over 11 percent of the total population belongs to a visible minority (Canada Statistics 1996). Furthermore, according to 1996 Census data, 8.3 percent of those living in the three sections of the City where the gardens are located belong to a visible minority. By comparison, in Montreal, members of one or more ethnic communities belong to each garden site and eight garden sites are classified as multicultural because more than 50 percent of their members come from different ethnic backgrounds (Reid 1997a, 6).

As an added note, in the Montreal example special plots had been developed for the physically disabled and those with AIDS (Reid, 1997a, 6). The researcher, however, did not observe any special plots to accommodate those with special needs in Winnipeg or saw any gardeners with visible physical disabilities at the garden sites.

Gardeners were asked for their opinion about the accessibility of allotment plots. As Table 4.5 indicates, over 50 percent did not think there were enough plots available within walking distance of their home, while more than 60 percent held that plots were available and accessible to anyone who wanted one. These data suggest that plot location was not perceived as a barrier to most respondents, even though the majority concluded that there were not enough plots within walking distance of their home. This was most likely because the majority used personal vehicles to travel to and from their plots; hence, travel distance was not an issue.

Table 6.5. Gardeners' Opinions about Plot Accessibility

Statement	% Strongly Agree	% Agree	% Neutral	% Disagree	% Strongly Disagree
Enough plots available within walking distance of home	23.9	14.9	4.5	35.8	20.9
Plots are available & accessible to anyone who would like one	34.3	32.8	4.5	23.8	4.5

Based on the information provided and field observations, allotments do not appear to be equitably accessible. The majority of gardeners could neither walk nor cycle to their plots, thus they were required to use either a personal vehicle or public transportation, and furthermore, public transportation to some of the plots was limited. Consequently, garden site location was a physical barrier to those without personal vehicles. Further physical barriers existed at the garden sites, as no plots were designed specifically to cater to the needs of the physically and mentally challenged. The lack of participation by visible minorities, as well as the physically and mentally challenged, also suggests social

barriers are present. This lack of participation by ethnic minorities suggests that allotments gardening in Winnipeg remains an activity embedded in its historic roots and links to the United Kingdom and Western Europe, which has not yet embraced newer immigrants from other regions of the world.

That those under the age of 30 years were not represented in the sample suggests this age group did not rent plots owing to such factors as plot location and/or other priorities in their lives. Incomes were fairly diverse, with the most notable difference being among those earning over $50.000.00 per year; there were substantially fewer gardeners in this category as compared to the general population. This indicated that allotment gardening was not a preferred activity of higher-income earners rather than an access barrier.

6.3.1. Health, Socialisation and Education Benefits

There is little doubt that gardeners understand and appreciate the health benefits of gardening, as three out of the five most cited reasons for gardening given by respondents relate to health. They are as follows:

1) outside recreation/hobby: 70.2 percent
2) mental relaxation: 17.9 percent
3) nutritious food: 16.4 percent

In addition, 'physical activity' placed sixth on this list with 13.4 percent of respondents giving this reason. Other data from the survey support these reasons; all respondents agreed with the statement that "gardening was a healthy activity", and 79 percent agreed that garden produce was more nutritious than produce at the grocery store.

Perhaps the most dangerous health risk was the indiscriminate use of chemical pesticides and herbicides. One gardener, who worked for Agriculture Canada in a testing laboratory, remarked that renters on neighbouring plots frequently misused these chemicals by applying too much or the wrong chemical.

Allotment gardening is also an activity where people meet and socialise. In the sample, most gardeners knew others cultivating plots near them (96 percent) and, of these, 84 percent had met their plot neighbours at the garden site. Most of the socialising, however, took place at the garden plots, as only 47 percent knew about social events organised for gardeners such as harvest potluck dinners and, of these, 61 percent attended. The sharing of gardening knowledge was more common with 84 percent of those surveyed doing so, while 59 percent stated that they had taught others to garden.

Even though gardeners socialised at their plots, only 6 percent gave this activity as a main reason for gardening. Socialisation, then, appears to be a less important benefit of the gardening experience; a conclusion supported by the fact that relatively few gardeners attend social events organised away from their plots.

Access to expert knowledge and training (this information differs from that which is regularly and informally exchanged between gardeners at this plots) is important to the success of the gardening experience. It alleviates some of the frustration when horticultural problems arise by providing rationale and solutions, and shows gardeners how to be more

productive. It also contributes to feelings of satisfaction that come from mastering new skills. In the Montreal example, trained horticulturists employed by that city visited garden sites on a rotating basis to give advice and otherwise work with gardeners (supra p.46). In Winnipeg, by comparison, any training and access to expertise is offered solely through the garden societies, which organised workshops and garden competitions or, as was the case of Lindsay Gardens, two senior gardeners were available for giving advice. Although, the City of Winnipeg owned and rented the majority of plots, it did not offer any training services to gardeners. Sixty-two percent of gardeners sampled in Winnipeg belonged to gardening societies and through them had access to training.

Furthermore, this access to training appeared to have an impact on gardening techniques, as there were differences between garden society members and non-members. More garden society members used various methods to increase/maintain their plot productivity, including the application of chemical fertilisers, thus utilising their plots more effectively. Conversely, a greater percentage of non-member gardeners (those renting directly from plot owners) used chemical insecticides and herbicides.

The gardening experience provides health benefits and socialisation opportunities, which reinforce positive aspects of this activity. Even so, little is being done to enhance this experience through formal education and training. The City of Winnipeg does the least, as it leaves the organisation of this recreation to others. In addition, this researcher observed that there seemed to be less of a sense of community among those renting plots directly from the City in that they appeared more isolated from garden site issues and

concerns. Alternatively, those on garden-society plots were more likely to know about plans for the garden sites, and frequently discussed issues relevant to the membership. For example, garden society members were more likely to describe possible solutions to problems of theft or vandalism, which they had tried, while those experiencing the same problem at City-operated sites considered such losses a cost of gardening and did not anticipate any resolution to the problem.

6.4. Conclusion

The contribution of Winnipeg's allotments to sustainable development was assessed using the theme model. Five issues important to sustainable development and linked to allotment gardening were consequently defined and examined under the three sub-themes of economic, environmental and social aspects.

Gardeners saw some economic benefits from their activity in that allotment gardening provided them with an affordable form of recreation and, consequently, contributed to their quality of life. In addition, there was a small economic gain, as their "guesstimated" gardening revenues exceeded costs. The allotments, however, were not being used to alleviate poverty. Even though those with annual family incomes under the poverty line were represented among the gardeners, few reported that they gardened to reduce the family food budget. Thus, the benefits of allotment gardening appear to be non-monetary.

Access to plots was not equitable. They were not located in areas of the city with high concentrations of low-income populations, which lends support to the conclusion that allotments were not being used as a poverty alleviation strategy. Furthermore, plots were generally difficult to reach without a personal vehicle. Consequently, those who could not drive were discouraged from renting plots and people with lower-incomes would likely be among those without vehicles. Other social barriers were also evident as none of the gardeners had visible physical or mental disabilities. Moreover only one gardener was from a visible minority and few were immigrants, suggesting that allotment gardening remains a traditional activity that has not been able to attract newcomers from other cultures.

Location of the plots could also partially explain the lack of gardeners under the age of 30, as they were not located in areas with a high concentration of rental accommodation where young adults are more likely to live. Alternatively, all income categories were represented except those earning less than $10,000.00 per year, and there were fewer gardeners earning more than $50,000.00 than in the general population. This lack was probably not because of the presence of access barriers, but motivated by lifestyle choices.

Only five gardeners used organic cultivation techniques regularly. Otherwise, awareness of these techniques seemed to be low. Garden societies offered the only educational programs and these were dominated by older gardeners who were probably unaware of organic methods or who preferred to use their traditional techniques. Younger gardeners

that would be more motivated to use organic methods were among the minority of gardeners.

Gardening provided both health benefits and an opportunity to socialise. Socialisation, however, seemed to be a less important benefit, as few gardeners attended social events organised away from their plot and it was rated low on the list of reasons for gardening.

There is no doubt that allotment gardens have some positive social and environmental aspects and that they enrich communities just by their presence. They provide much needed green space and protect niches of biodiversity, as well as enhancing the quality of life of the gardeners. Winnipeg's allotments do, however, have some deficiencies, at least in the extent that they contribute to sustainable development, as they only minimally support poverty alleviation and ecosystem integrity. These deficiencies and some of their possible causes form the basis for the concluding chapter.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.0. Introduction

This study explored the notion that gardening on urban plots can contribute to sustainable development by providing a means of alleviating poverty and promoting self-reliance, while conserving and protecting natural resources. To this end, allotments in Winnipeg were described and then their contributions to sustainable development assessed. Before moving into the study conclusions, a brief overview of the study is given so that salient points from the historical overview, concept of sustainable development and the research method are captured. The conclusions are then presented for each of the five research questions and the study as a whole, and the chapter ends with a list of suggestions for further research.

7.1 Study Overview

The historical overview of allotments revealed that they had started in Britain in the 1800s as a poverty alleviation strategy and source of recreation for landless industrial labourers. This practice spread throughout Europe and came to Canada with the waves of immigrants arriving at the beginning of the 20th Century, and has continued since then. After a general decline from approximately 1950 to 1970, allotment gardening experienced a resurgence in interest and participation along with increased environmental awareness in the 1970s and again in the 1990s in many European and North American cities.

Sustainable development is historically linked to allotment gardening; these linked aspects include poverty alleviation and more recently, environmentalism. Furthermore, at the urban scale, allotments can potentially increase urban green space and provide a means of recycling urban organic waste, while at the individual scale they can benefit gardeners and their families both economically and socially by providing a source of nutritious food, outdoor recreation and opportunities to socialise. Even so, little is known about how to integrate allotment cultivation into both community development and planning efforts guided by the concept of sustainable development. Consequently, the contribution of Winnipeg's allotments to sustainable development was assessed by using the theme conceptual model, which considers economic, social and environmental aspects of sustainable development, to develop the conceptual framework for this study and the ensuing research questions.

Before embarking on this assessment, it was necessary to gain a better understanding of the allotment gardening system in Winnipeg generally. Hence, the physical and cultural space of these allotments was explored. It was found the Winnipeg's allotments reflected their British heritage in the way the garden sites were each spatially organised and in gardeners' motivations and crop choices. These crop choices, though, did vary spatially when compared for the three largest allotments implying that growing conditions varied according to garden site location.

7.2. Conclusions

This study has been exploratory in nature, and has produced much data and numerous avenues of inquiry. Sustainable development, a still evolving concept and sometimes-vague practice, has provided a context for the investigation. At the outset, the links between sustainable development, a concept which inherently considers the relationship between ecosystem health and human well-being, and allotment gardening seem obvious and intuitive. After all, this urban activity was initially started as a poverty-alleviation strategy, a goal that is shared by sustainable development, and further expansion of allotments in 1970s and 1980s was largely driven by the rise in awareness about environmental conservation, another sustainable development goal. Yet this research has shown that the reality of allotment gardening, at least in Winnipeg, is that it neither corresponds necessarily with the expectations and goals of sustainable development nor reflects the historic roots of allotment gardening in poverty alleviation or environmental values relevant to the establishment of allotments elsewhere.

The first research question investigated poverty alleviation. While approximately 25 percent of the gardeners in the study sample had annual family incomes under the poverty line, only two in this category stated that their main reason for gardening was to "reduce the family food budget". Furthermore, none of the allotments was located in areas of the City where there were higher concentrations of lower-income households, suggesting that they had not been established with poverty alleviation as a goal. Other data aided this

analysis. When respondents' annual family income was compared to that of the general population living in sections of the city where plots are located, there is a higher proportion of lower-income earners represented in the sample. While these data support the inference that lower-income earners are using plot cultivation as a coping strategy, the conclusion is otherwise. When all the data are considered, more gardeners were represented in all income categories, including middle-income ones, except the "over $50,000.00" category. Furthermore, over 70 percent of respondents gave "outdoor recreation/hobby" as their main reason for gardening. Consequently, allotment gardening appears to be an affordable pastime for lower- to middle-income earners rather than a poverty-alleviation strategy.

The community garden approach furnishes an interesting contrast. Here, gardens are started with poverty alleviation as their main goal; in this model tools, garden inputs, and even plots are shared along with the produce. In addition, they tend to be located in lower-income neighbourhoods so that the participants can walk to their plots. Based on the information provided, however, the future of community gardens seemed nebulous. These gardens are usually dependent on external and often less reliable funding sources and land-tenure arrangements because they are located on inner-city vacant lots, which can readily be used for other forms of development.

There is potential for future research here. Both models—allotments and community gardens—have aspects that adhere to the principles of sustainable development. A study

comparing these models could possibly inform civic planners and community activists much about developing successful plot programs in communities.

The next question examined economic benefits. Most gardeners had neither calculated the costs of cultivating their plot nor had they valued their produce: instead, they provided rough estimates of both. The estimated dollar value of gardening was $148.03 (mean); a low figure suggesting that gardeners were not cultivating plots for economic gain. Further evidence, however, indicated that gardeners were not realising the value of their activity; estimates given by one gardener who had calculated product value, and work done by a Canadian researcher, showed the actual value of plot produce to be potentially between $1,000—2,250.00 per year on intensively gardened plots. This apparent lack of interest by the majority of respondents in realising economic benefits suggests that benefits were non-monetary. This conclusion raises questions, though, about what aspects of plot cultivation gardeners find beneficial and how they value these benefits.

When location and ease of access to the plots are considered, further clarification emerges as to who uses them and why. Generally, plots were not located so that they were accessible to those without personal vehicles. Furthermore, garden sites did not have storage sheds and only two had water sources, thus, even those gardeners living near their plot had to drive, at least on some occasions, to transport tools and water. Three identifiable groups of people were not represented among the sample: those under the age of 30; those belonging to visible minorities; and people with physical and mental

disabilities. The lack of participation by young adults could be for such reasons as little interest in this activity or many may still be living in the family home. Plots, however, were not located in high rental areas where there is a higher concentration of young adults, suggesting that this may be a primary reason. Furthermore, during 1997 a community garden that had been established in an area of the city with a high concentration of young adults had mostly young adults as gardeners, according to one of the organisers. Apparently interest and demand is there if plots are appropriately located and organised. Little or no participation by visible minorities and the physically and mentally disabled at any of the garden sites hinted at the presence of social barriers as well as lack of access due to plot location. These social barriers were not identified in this study, but warrant further investigation. One possible reason for lack of participation by visible minorities may be that allotment gardening remains a traditional activity, which has not evolved so that it is open to new immigrants.

Awareness of environmental impacts and aspects of gardening was low among the sample, and there was little support for the use of organic gardening techniques among gardeners, garden societies and the City of Winnipeg. Only five gardeners employed organic techniques; otherwise, use of organic soil enhancements such as compost, manure and dug-in debris was low, while 63 percent used chemical pesticides rather than more environmentally friendly options. Furthermore, few gardeners used techniques such as mulching, inter-planting or crop rotation.

The reasons for this low awareness and response to environmental concerns were partly due to lack of regulation and policies that thwarted certain activities. For example, the City of Winnipeg would not allow gardeners to have compost bins at the garden sites, and required that all vegetative debris be removed at the end of the growing season so that plots could be tilled. These requirements substantially reduced the use of both these methods. Alternatively, chemical pesticide use was allowed at all garden sites.

Generally, gardeners lacked knowledge about organic gardening techniques and associated environmental benefits. Those belonging to garden societies, however, had the opportunity to participate in expert training sessions and workshops put on by the gardening society, thus increasing their gardening knowledge. Moreover, this training had an impact on cultivation methods used by these gardeners. When gardening techniques were compared between those belonging to garden societies and non-member gardeners, the comparison showed that more garden society members used various methods to increase/maintain plot productivity (including chemical fertilisers), while more gardeners not belonging to garden societies used chemical insecticides and herbicides. These training sessions, however, seemed to be based on traditional cultivation methods and did not have an organic emphasis. In addition, most gardeners said they gardened for recreation rather than as an environmentally motivated lifestyle choice, implying that they would be less motivated to garden organically and acquire the necessary knowledge to do so.

There is an important role here for the City of Winnipeg, as training and education programs using the existing structure of allotments, provide a way to transmit the goal and practices of sustainable development, while improving the gardening experience. Furthermore, there is much potential to advance neighbourhood-level community development strategies based on sustainable practices.

There does, however, appear to be little motivation for the City to take this course of action. Presently, the establishment and management of allotments are mainly in the hands of citizens and garden societies. The City, at least at the time of this study, was not intending to open any new garden sites, though community groups could establish new gardens on vacant land with the owners' permission and community committee approval. Even so, few new gardens have been established, which could indicate that demand for plots is being met. This does not, however, parallel the situation in other Canadian cities such as Montreal and Vancouver, which have seen an increase in demand for garden plots. In particular, Montreal has pursued an environmentally sustainable development strategy, which successfully integrates allotment gardening. Furthermore, the number of allotments in Montreal has grown substantially over the past six years. Based on this experience, it can be concluded that Winnipeg is missing out on an opportunity to pursue a more sustainable path of development by not promoting and supporting environmentally sustainable allotment gardening. This lack of promotion by the City, then, appears to be one of the reasons why Winnipeg's allotments are not contributing to sustainable development to a greater extent.

It could be argued, though, that the impetus for allotment garden creation should come from the citizens, which raises the question as to why people are not asking for new allotment sites in Winnipeg. A look at plot rentals at the time of this study shows that Riverview Gardens and St. James Horticultural Society both had a waiting list and the plots at Lindsay Street Gardens were fully rented, while St. Amant and the City of Winnipeg allotments in the survey were almost fully rented. Alternatively, Manitoba Hydro and the Ft. Garry Horticulture Society had many empty plots (Manitoba Hydro had approximately 400 and Ft. Garry Horticulture Society, approximately 70). Poor location and lack of organisation partly explain these two low rental situations. A Manitoba Hydro spokesperson reported that their plot program was a public-relations exercise and few Hydro resources were allocated to plot advertising and maintenance. In addition, those renting Manitoba Hydro plots claimed that Hydro was slow to cut the grass surrounding the plots and there were drainage problems resulting in mosquito infestations. Ft. Garry Horticulture Society had recently moved their plots to a new location with poor drainage, which resulted in fewer gardeners. While the numbers on waiting lists and empty plots do not necessarily demonstrate unmet demand for plots, they do, nevertheless, suggest that factors other than location are relevant to determining why no new plot sites have been recently developed.

This demand for plots appears to be related to plot promotion and organisation as well as location. Evidence for this conclusion comes from the experience of those starting community gardens during the time this study was done. These gardens needed resources to start-up, such as additives to increase soil health, tools to clear debris from garden sites

and know-how to organise both the gardeners and the gardens. Even though these new community gardens were located in low-income areas and attracted gardeners, many failed within the first few years. These failures support the argument that a well-established institutional structure is necessary in the creation and on-going vitality of gardens. This argument is further advanced by the fact that allotments managed by horticulture societies, which promote and manage plot programs at established garden sites, are often over-subscribed. It seems, however, that citizen-led efforts are not sufficient and City involvement, beyond what it is now doing, is essential to ensure the tenure and on-going health of the gardens.

While the rhetoric of sustainable development links allotment gardening to urban sustainable development, the reality has not yet been realised in Winnipeg. Here allotment gardening has not caught-up with these sustainable development aspirations, and this lack of progress towards sustainable development in the face of so much rhetoric is intriguing. At the individual level, gardeners mainly cultivate plots for recreation and the enjoyment of fresh vegetables; many use chemical fertilisers and pesticides being oblivious to their environmental impacts. Even at the institutional level, the garden societies and city, there is little support for using organic methods.

The conclusion that allotments are not used as a poverty-alleviation strategy is also interesting, given the high level of poverty in Winnipeg. Elsewhere, and historically, increasing urban poverty had led to the establishment of plot programs. Once again, a lack of support at the institutional level is probably one of the main reasons. Another may

be that community self-help groups do not promote allotments as a poverty-alleviation strategy, and, instead, support other social programs. For example, Winnipeg has an established food bank, which has seen a dramatic increase in use since 1987 (Silver 2000, 42).

At the institutional level, the organisational structure and level of motivation appears to be weak for both community groups and the City of Winnipeg when compared to those in Europe. Here, the horticulture societies operate independently, while other community groups must fight hard to locate funding to establish gardens. The City of Winnipeg also seems unmotivated even though their planning policy would suggest otherwise. There are several possible reasons for this such as: lack of prodding by community groups; little political will; or a regulatory and zoning structure that inhibits change and needs dismantling or revision.

While the reasons for the low level of involvement by the City of Winnipeg still needs to be clarified, it is evident that the proper institutional arrangements are necessary to ensure that allotments are advantageously located so as to meet the needs of the community and contribute to sustainable development. Ideally, they should be located within neighbourhoods rather than relegated to the periphery of the City. While it could be argued that needed space is not available within neighbourhoods, there is little evidence to support this claim. Even new neighbourhoods in Winnipeg have ample green space that can be used for gardens, while vacant lots in more densely populated areas can serve the same purpose.

This study demonstrated that while allotments have the potential to be an effective sustainable development strategy, much of this potential is not realised in Winnipeg to the degree that it is elsewhere. In addition, this research begins to define how allotments need to be organised so that they can meet this goal. There are several considerations. One is location of garden sites, which should be distributed throughout the urban landscape and available to those from different socio-economic backgrounds so that they can meet the varied needs of potential participants. Moreover, these garden sites need to be protected from other forms of urban development so that they can flourish and became part of the community. Education and training should be provided to enhance the gardening experience by showing gardeners how to increase plot productivity and integrate more sustainable techniques into their practises. Civic policy that supports the development of viable allotments, and concurrently can contribute to sustainable urban planning instead of working against it, is also necessary. Finally, allotment gardens need to be managed by motivated people within an organisational structure that enables decision-making by gardeners, their representatives and civic officials to ensure the vitality of their gardens.

7.3. Recommendations for Further Research

This study represents only one portion of the knowledge needed to design sustainable communities and contributes to our understanding of the role that allotment gardening can play in them. Even though much has been learned about allotments in Winnipeg and the

links between sustainable development and allotment gardening, this analysis has revealed several areas that require further research.

There is a need to build a set of sustainable development indicators for urban agriculture generally and allotment gardening specifically, so that allotment programs and policies can be evaluated. This would aid in urban agriculture development generally. In Winnipeg, a good understanding of the civic policies affecting the creation and management of allotments and identification of land tenure and funding issues for allotments is lacking. The design and implementation of successful plot programs would benefit from research into the similarities and differences between allotments and community gardens. Allotment garden programs would gain from knowing more about gardener motivations and which aspects of plot cultivation that they find beneficial. In addition, information on ways to increase plot productivity using organic methods and thus realise greater economic gains to gardeners would be useful. Also, it would be advantageous to identify social barriers, which prevent the participation of young adults, visible minorities, and the physically and mentally challenged, and ways to effectively integrate organic techniques into allotment cultivation.

Sustainable community development represents a huge challenge for the future and it is becoming increasingly urgent as urban populations grow. At the same time, population growth and increasing environmental degradation compel planners and policy makers to find ways to expand food production while protecting the environment. Urban agriculture and allotment gardening, specifically, offer one possible solution. Their contribution to sustainable community development has been partially clarified in this

study, but much work still needs to be done so that policy makers and planners can more fully integrate allotment gardens into urban development strategies.

APPENDIX 1

QUESTIONNAIRE

Location of Garden _____ Sample #_____ Date: _____

Wpg.[] Hydro [] Lindsay []

I. Gardener Profile

1. Do you do most of the work on this plot?
No.....0 Yes.....1

1a. Besides yourself who else works the plot?
Spouse/partner []
Children []
Friend []
Neighbou []
Hired help []

2. What are your reasons for working a garden plot?
Outside recreation/Hobby []
Meeting other people []
Creative activity []
Physical activity []
Organic produce []
Nutritous food []
Reduce family food budget []
Family tradition/custom []
Sell product []
Mental relaxation []
Family activity []
Other (specify):_____

3. How many years have you maintained a garden plot? □□

3a.If more than two years, have you done so continuously?

No.....0 Yes.....1

If no, then:

3b.Over the last 10 years, how manyyears did you work a plot? □□

3c. Why didn't you work a plot some years?
Lack of time to maintain it []
Unable to get a plot []
Unable to get plot wanted []
Ill health []
Lost interest []
Not worthwhile []
Personal []
Away for summer []
Other (specify):_____

4. This summer are you cultivating more than one plot?

No.....0 Yes.....1

4a. If yes, then how many plots are you cultivating?

5. Do you always rent the same plot(s)?

No.....0 Yes.....1 Sometimes.....2

6. How much time, on average, would you say you work on your plot(s) each week?
During the busy season ☐☐
During the quiet season ☐☐

7. Do you belong to a community gardening association or horticultural society?
No.....0 Yes.....1

7a. If yes, which one?_____

8. How did you first get interested in working a garden plot(s)?
Family member []
Friend(s) []
Co-worker []
Volunteer org []
Media []
Other:_____

II - Plot Characteristics & Land-Use - see Table 1.

III - Economic Benefits

9. Roughly what proportion of your total yearly intake of fruits & vegetables comes from your garden plot(s)?
☐☐%

10. How much do you think it costs per year to grow your own vegetables & fruits including rent and any hired help?
under $50.00 1
$50.00-100.00 2
$100.00-200.00 3
over $200.00 4

11. What is mainly done with the produce you obtain from your garden plot?
Domestic use 1
Give it away 2
Domestic use & sale 3
Sell all 4

12. How many people in your household would eat produce from the garden plot(s)?
☐☐

13. What would you consider to be the approximate value of the produce from your plot(s) which you used at home last year? (NB. if applicable)
under $50.00 1
$50.00-100.00 2
$100.00-250.00 3
$250.00-500.00 4
over $500.00 5
N.A 6

14.If you give some of it away,then to whom is it given?

Relations	[]
Friends & neighbours	[]
Co-workers	[]
Poor & needy	[]
Charitable organization	[]
Church	[]

Other:_____

15.If you sold it,to whom do you principally sell it?

Farmer's market	1
Grocery stores	2
Friends & neighbours	3

Other (specify):_____

16. If applicable,then approimately what do you think was the value of the crops you sold last year?

under $50.00	1
$50.00-100.00	2
$100.00-250.00	3
$250.00-500.00	4
over $500.00	5

IV - Social Benefits

17. How did you learn to garden?

Parents	[]
Friends	[]
School	[]
Reading	[]
Television	[]

Other:_____

18. Have you taught anyone else how to garden?

No.....0 Yes.....1

19. Do you share your gardening knowledge/information with other gardeners?

No.....0 Yes.. 1

20. Do you know any of the other peoplecultivating plots near yours?

No.....0 Yes.....1

20a. If yes, did you meet them here at the garden plots?

No.....0 Yes.....1

21. Do you think gardening has increased your knowledge about

Eating better	[]
Environmental issues	[]
Gardening organically	[]

Others (specify)_____

Would you please tell me if you Strongly Agree = 1 Agree=2 Neutral=3 Disagree=4 Strongly Disagree=5 with these statements.

22. Gardening is a good way to connect with nature.

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree	5

23. Gardening is a healthy activity.

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree.	5

24. Food from my garden is more nutritious than food purchased from the grocery store.

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree	5

25. Are there any social events organized by the gardeners from this allotment?

No.....0 Yes.....1

25a. If so, do you attend them?

No.....0 Yes.....1

26. Can you tell me about any family and/or community events that have taken place at the garden plot(s)?

V - Cultural Benefits

27. Do you integrate decorative plants and/or decorative elements into your garden?

No.....0 Yes.....1

If so, for what purpose?_____

28. Is your garden a source of materials for creative work?

No.....0 Yes.....1

29. Would you consider your garden to be a source of inspiration for creative work?

No.....0 Yes.....1 N.A.....2

Please indicate if you Strongly Agree = 1 Agree=2 Neutral=3 Disagree=4 Strongly Disagree=5 with these statements.

30. In your family, gardening is a tradition.

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree	5

31. It is important to me that my garden looks pleasing.

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree	5

32. Gardening is a creative activity.

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree	5

33. The allotment gardens where I participate are important to the identity of the local community where they are located?

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree.	5

34. Gardening is a good way to maintain bonds between family members.

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree.	5

VI - Environmental Benefits; Gardening Methods & Techniques

35. Gardening is a good way to improve the local environment.

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree	5

36. How do you mainly travel to and from your home to your plot(s)?

Walk	1
Public transit	2
Bicycle	3
Personal vehicle	4
Other specify)_____	

37. Do you routinely use mulch?

No.....0 Yes.....1

38. How do you increase/maintain productivity of your plot?

Manure	[]
Chemical fertilizer	[]
Compost	[]
Crop rotation	[]
Interplanting	[]

Other aspects:_____

39. Are there compost bins available for your use at the garden plot(s)

No.....0 Yes.....1

40. By what means do you control insect pests?

Chemical insecticides	[]
Using natural enemies	[]
Env.safe insecticides	[]
Integrated pest mgm't	[]
Attract beneficial insects	[]

Other: _____

41. How do you control weeds?

Regular hoeing/weeding	[]
Mulching	[]
Chemical herbicides	[]

Other (specify):_____

42. How do you water your garden?

Hose from nearby stand-pipe	1
Haul water from home	2
Rain-fed only	3

Other(specify: _____

43. What tools and equipment do you regularly use to cultivate your garden?

Roto-tiller	[]
Spade	[]
Fork	[]
Hoe	[]
Sprinkers	[]
Fertilzer spreader	[]
Pruning/cutting clippers	[]

Other:_____

VII-Biodiversity Benefits

44. This summer have you planted any new varieties of plants?

No.....0 Yes.....1

44a. If yes, which ones?_____

44b. And why? _____

45. Do you save seeds from year-to-year?

No.....0 Yes.....1

45a. If yes, then for what reasons?

_____

46. Do you plant native and local plant varieties?

No 0 Yes 1

47. Have you ever developed any varieties of plants that would be considered well-suited to the local environment?

No.....0 Yes.....1

47a. If yes, is it registered?

No.....0 Yes.....1

48. Are you familiar with 'heritage seeds'?

No.....0 Yes.....1

48a. If yes, do you save them?

No.....0 Yes.....1

49. What kinds of urban wildlife have you noticed in the gardens?

_____

49a. Do you consider any of them to be a problem?

No.....0 Yes.....1 Sometimes.....2

VIII - Barriers

50. What problems, if any, have you encountered in renting a garden plot(s)?

Availability of plot	[]
Location of plot(s)	[]
Rental Cost	[]
Bureaucracy/paper work	[]
Other (specify):_____	

51. What problems, if any, have you encountered in cultivating your garden?

Lack of cooperation with fellow gardeners	[]
Disease and pests	[]
Poor drainage	[]
Vandalism	[]
Theft	[]
Other (specify):_____	

Please indicate if you Strongly Agree = 1 Agree=2 Neutral=3 Disagree=4 Strongly Disagree=5 with these statements.

52. I didn't encounter any problems getting a garden plot(s).

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree.	5

53. There are enough garden plots available within walking distance of my home

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree	5

54. Garden plots are available and accessible to anyone who would like one.

S. Agree	1
Agree	2
Neutral	3
Disagree	4
S. Disagree	5

55. How do you think the City of Winnipeg/Manitoba Hydro/plot owner might better assist people with allotment gardens?

_____

_____

IX. Personal Characteristics

56. Gender: Male.....0 Female.....1

57. What age are you? ☐☐

58. Were you born in Canada?

No.....0 Yes.....1

58a. If no, what is your country of birth?_____

58b. Do you consider yourself to be a member of an ethnic community?

No.....0 Yes.....1

58c. If yes, which one?_____

59. Into which of the following categories does your annual family income fall?

$10,000-20,000	1
$21,000-30,000	2
$31,000-40,000	3
$41,000-50,000	4
over $50,000	5

60. What is your highest level of formal education? _____

61. Are you presently:

Fully employed	1
Part-time employed	2
Retired	3
Homekeeper	4
Other:_____	

Personal Observations:

1 2 3 4 5

Cooperative.....Uncooperative

1 2 3 4 5

Enthusiastic.....Unenthusiastic

1 2 3 4 5

Knowledgeable.....Novice

1 2 3 4 5

Physically fit.....Poor health

1 2 3 4 5

Garden well tended.....Garden neglected

Other:_____

Plot Characteristics and Land use

Plot #	Size (l x w in ft)	Distance	Vegetables Grown	Fruits & flowers	Herbs
		from home	(varieties)	(varieties)	under cultivation
1					
2					

	Vegetables: corn=c, peas=p, tomatoes=t, green beans=gb, yellow beans=yb, pole beans=pb, carrots=cr, lettuce=l, radishes=r, cauliflower-cf, cucumbers=cc, onions=o, garlic=g. squash=s, pumpkin=pk Fruits: strawberries = st, raspberries=rb, melons=m, rhubarb=rb cabbage=cb, broccoli=b,

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