

**Envisioning sustainable forestry communities
in Northern Ontario:**

the role of architecture and design

by
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presented to the University of Waterloo
in fulfilment of the
thesis requirement for the degree of
Master of Architecture

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

ABSTRACT

This thesis envisions sustainable forestry communities in Northern Ontario. Forestry communities struggle to maintain a quality of life against obstacles such as external (often global) economic pressures on the community's forestry operation, youth out-migration and lack of local control over their natural resources. Principle aims in this thesis are to understand the built environment of small, remote forestry communities; to propose a vision for community self-sufficiency and long-term sustainability; and lastly, to identify the role of architecture in envisioning a built environment that might evolve alongside principles for long-term sustainability.

The design exploration is focused on enhancing the quality of place in the north through effective integration with the boreal forest and its renewable resources. Scandinavian models emerging in towns with similar ecological conditions to Canada suggest that rethinking the use of local ecological resources might lead to appropriate architectural response in the region – one which offers stronger identity for these forestry communities.

Such design processes are centered on two main questions: what overall framework will allow communities themselves to self-organize local resources, culture and knowledge towards long-term sustainability and regional identity?; and how can architecture and design specifically contribute to these objectives as well as sustain forestry communities?

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For my family

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Fig. 0.1 View of saw mill adjacent to Dubreuilville.

INTRODUCTION

“Anyone who has paid attention to Ontario’s forest industry over the past few years knows that it is in trouble. Numerous mills have closed, thousands of working people have lost well-paying jobs, and many communities in the northwestern and northeastern regions have been devastated by job losses, population declines, and eroding tax bases.”¹

A very small percentage of individuals outside forestry communities either understand or appreciate the magnitude of their current crises. Forestry communities are towns that have ‘grown-up’ around and still remain reliant on the forestry industry as a core source of employment. Currently, the forestry industry in Northern Ontario is struggling to maintain profit in a global marketplace. Consequently, the communities are left struggling to maintain their quality of life.

The trend among larger corporate forestry operators is the centralization and consolidation of operations from different communities into one location. Resource allocations from the closed operations are redirected to another processing location. This trend, coupled with smaller, private local operations that simply can not compete, leads to periodic and permanent closings of forestry operations. The effect on forestry communities is instability and ongoing unease. In the case of mill closures, the sustained existence of smaller communities is at risk:

“Each job in the forest industry supports about 1.5 indirect jobs. When well-paid forest workers lose their jobs, the community’s income drops and the revenues from other sectors, such as retail, the housing market and the service industry, will decline if no new activity replaces the lost jobs.

The community as a whole is left with an eroded tax base, an outflow of job-seekers and, in some cases, few prospects for economic growth. The full effects of mill closures may take years to surface. By then, especially in remote communities with few alternatives to forestry, the effects may be irreversible.”²

As a result, communities face out-migration of inhabitants (especially of youth) searching for livelihoods in larger cities with more favourable and stable opportunities. Economic and social strains are increased, as well, there is erosion and disappearance of regional culture and heritage. In addition, limitations on **local quality of place** increasingly make it difficult to attract and retain skilled labour, as well as residents.³

The most problematic aspect of the loss of community coherence is the looming disappearance of the wider network of forestry communities across Northern Ontario. Who then, will be looking after the forests? The undervalued role of these communities as ‘caretakers’ of the boreal shield forest remains vital to the future integrity of the vast ecozone. The continued existence of forestry communities is essential to effective management of the northern boreal forest and its invaluable resources – as well as the upholding of the heritage, culture and expertise of the region. The precarious state of forestry communities is a case for developing a strategy for their ongoing sustainability.

In their history of the ‘Provincial Norths’, Coates and Morrison outline a key characteristic of communities comprising the expansive northern provincial regions across the country:

“As one of the world’s greatest northern nations (at least in size), Canada has a remarkable record of failure and inactivity in the areas of northern-based architecture, urban planning or environmental awareness.”⁴

Their comment suggests that any strategy for sustaining remote forestry communities must address the quality and appropriateness of the built environment. Thus, the relationships between buildings residents inhabit, urban planning (the community systems organizing the built environment) and local ecological resources are fundamental to new approaches.

THESIS APPROACH

In response to the lack of architecture and design research focused on remote forestry communities, as well as the regional need for a long-term vision of daily life, this thesis is centered on the question: **what is the role of architecture and design in envisioning sustainable forestry communities?** Specifically, it is focused on rethinking the role of design, from towns, to buildings, to products, in relation to the human ecology (the way in which urban form, community systems and residents function with respect to their ecological resource base). The principle aim is to propose a vision for self-sufficient, sustainable communities by identifying broader design processes. In doing so, arrive at more detailed design responses.

Sustainability, in this context, can be defined as the continued existence of a community through a self-sufficient, confident and desirable quality of life. The quality of life is set within the *quality of place*, which is an 'aggregate measure of the external environment.'⁵ This measure includes, but is not limited to, the following facets: human ecology, housing and community services, public spaces and amenities, working and dwelling environments, population levels, creative and evolving built fabrics, self-sufficiency in terms of local resources, as well as attractiveness. Because the quality of place is grounded in a tangible built environment, the contribution of architecture and design interventions can be gauged. Accordingly, this thesis focuses on the *quality of place* as a generator for a self-sufficient, confident and desirable quality of life. Given the small population and size of forestry communities, the quality of place is largely influenced by economic flows from the local forestry operation (See Chapter I.2).

To broaden the consultative base for developing new roles for design towards envisioning a sustainable *quality of place*, I visited with the Northeast Superior Forestry Community (NSFC) several times during spring and summer of 2007, as well as winter 2008. The NSFC is comprised of the following six towns that are dealing with recession: Chapleau, Dubreuilville, Hornepayne, Manitouwadge, Wawa and White River. (It should be noted here that Manitouwadge will not be

Fig. 0.2 The geographical location of the townships included in the Northeast Superior Forestry Community (NSFC).

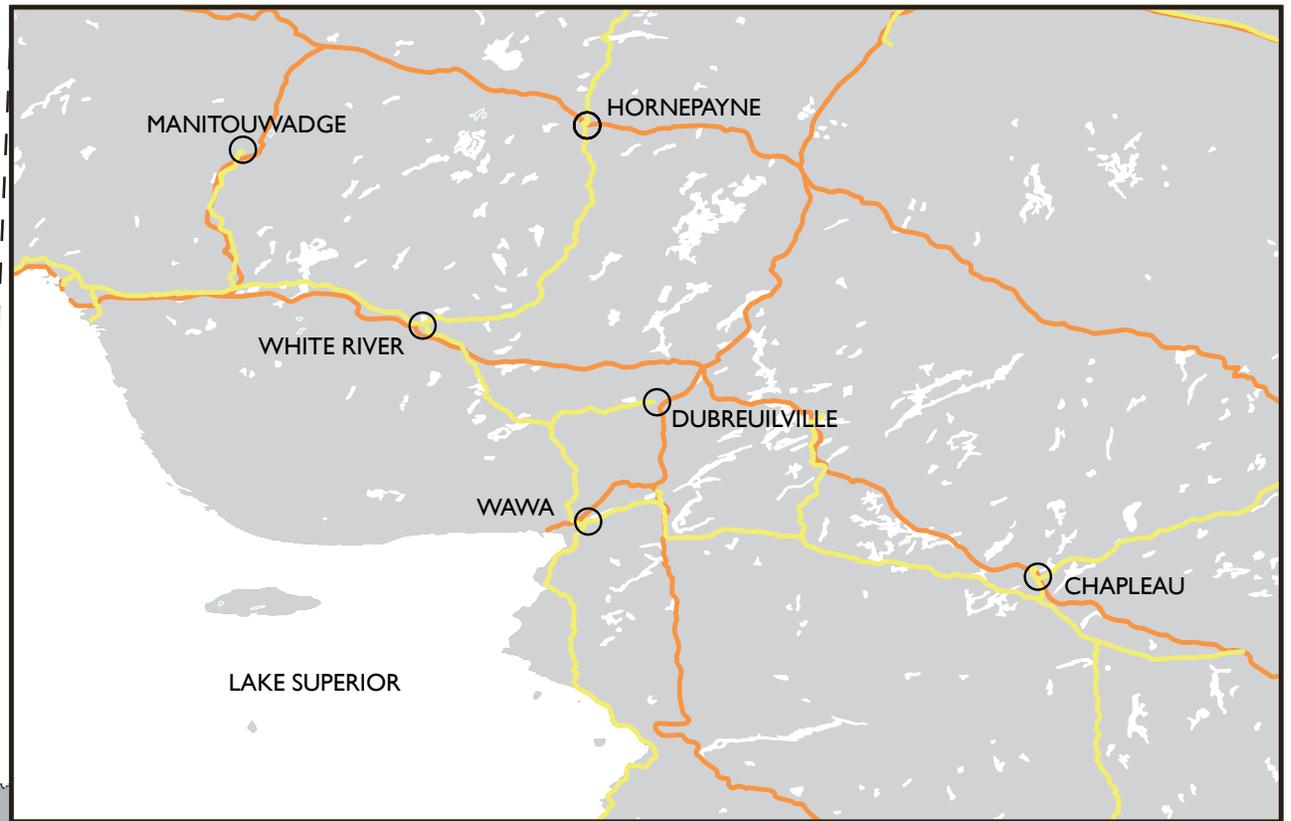
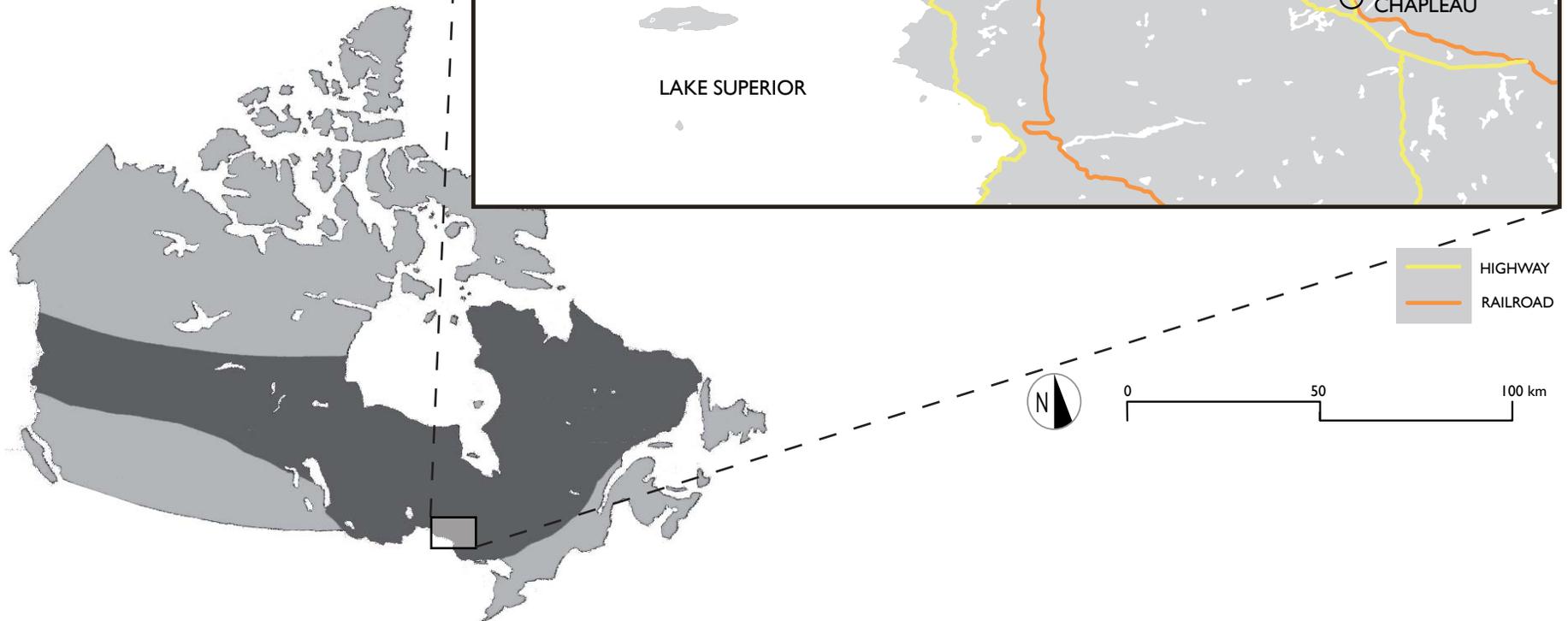


Fig. 0.3 Key map of Canada with the Provincial Norths outlined in dark grey, as identified by Coates and Morrison. This region was also referred to as Mid-Canada in a concept developed by Richard Rohmer.



specifically examined in this thesis because I was unable to visit with the town. As well, Manitouwadge is not traditionally reliant on forestry.) Field research included discussions with key informants representing political, economic and cultural aspects of the communities, participation in regional and local strategic planning sessions, interactions with residents, tours of community buildings and forestry operations, as well as general community and landscape experiences.

The resiliency of the forestry communities indicates the desire of residents to not only endure, but to continuously seek a better life for their community. It is inspiring. Based on regional issues identified by the field research, it is evident that local and recruited expertise in the communities is focused on short-term employment replacement through new forest resource uses and value-added initiatives. While townships actively search for opportunities and strategies to immediately address the unemployment dilemmas, strategies for a longer-term vision of sustainable models both at a community and natural resource level are not generally pursued.

Forestry communities have traditionally been at the mercy of external influences – evolving more as reactive places with little sense of local control of their destinies. Accordingly, this thesis responds to the need for collective, proactive envisioning of sustainable forestry communities. As Sim Van der Ryn, a renowned theorist and practitioner of sustainability and ecology reminds us:

“Sustainability implies that the use of energy and materials in an urban area be in balance with what the region can supply continuously through natural processes such as photosynthesis, biological decomposition, and the biochemical processes that support life.”⁶

Forestry communities in Canada offer great potential for sustainability. The boreal forest supplies a renewable source for energy and materials, as well as being a core economic generator. However, its broader potential often goes unfulfilled. A need for research focused on restructuring the shared fundamental circumstances of the human ecology of northern communities towards a more effective relationship with the surrounding natural systems is evident. This thesis research addresses this niche with an emphasis to the role

of architecture and design in not only ecological community restructuring, but long-term envisioning of a sustainable quality of place as well.

Design is used, in the thesis, as a tool to visualize a framework for community self-sufficiency. It includes the optimization of local resources, as well as diversifying and strengthening the local and regional economy through innovative uses of the forest. Moreover, design investigates reinterpreting traditional urban and building forms to provide new unique and responsive environments towards a new ecological mindset.

Architecture is often a critical interface between traditional and envisioned community; it connects inhabitants, daily life, and community identity through a built environment. The challenge in northern forestry communities is to envision a *quality of place* that reflects ecological consciousness, resiliency and a desirable living environment for such remote communities. A built environment – crafted through local resources – serves to enhance the quality of life and a sense of place, while shaping regional identity. David E. Miller lends guidance on such regionalism and environmental architecture:

“Architects need to work towards a rational and timeless architecture that sustains the qualities of place. The imperative question then becomes, how does a designer determine the overall conception and realization of architectural form that captures the spirit and quality of place and at the same time addresses the compelling issue of our day – the world’s ecological dysfunction?”⁷

The NSFC communities are unique in comparison to the larger cities of Canada; they offer a quality of life that has evolved in close relation to surrounding ecological resources. Accordingly, addressing the long-term sustainability for forestry communities should be responsive to the strengths and identity of these specific communities.

This thesis contends that envisioning and developing attractive living environments will strengthen remote communities such as those in the NSFC. Remote communities need to evolve in a creative way, not only from the

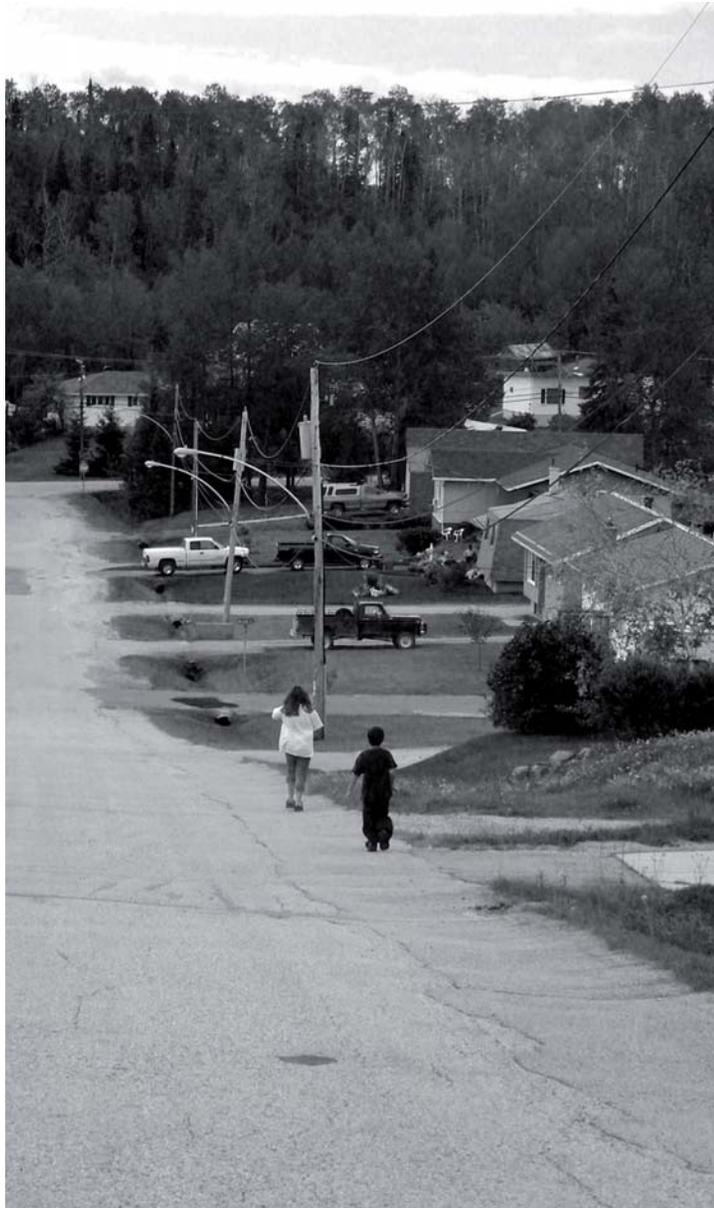


Fig. 0.4 A residential street in Hornepayne.

perspective of attracting people to a unique, highly ecologically self-sufficient way of life, but enhancing the *quality of place* for inhabitants as well.

CONTEXT – THINKING AHEAD

There is a growing divergence between large cities and their supporting networks of small rural and remote communities in Ontario. Slack, Bourne and Gertler (2003) state, “most of the province outside of the major metropolitan regions, and their adjacent hinterlands, is declining. **The sharpest contrast is between communities in the north and south of the province; and this north-south divide is growing.**”⁸ In addition, rural and remote communities in Ontario are often undervalued by larger cities, perceived as dwindling and of secondary importance. The outlook is uninviting for remote Northern Ontario communities: the potential for future growth is poor; key characteristics make it difficult for communities to sustain themselves and populations are declining.⁹ This divide indicates a need for new approaches to enhancing the *quality of place*. It raises the question:

If rural and remote communities are in decline now, struggling to maintain a quality of place – what will the living environment be like 50 years from now in the boreal region of Northern Ontario?

The current circumstances influencing the decline of remote communities evolved from processes accompanying the industrial era of development. The 21st century, however, brings an era of development increasingly centered around the notion of sustainability, and thus, affords the opportunity to be more creative in re-thinking the structure of fundamental systems supporting our daily life. Here the proposal to develop new living environments based on long-term sustainability, requires an imaginative vision of what could be:

What if we began to envision creative living environments responsive to the various and unique landscapes of the country? Instead of abandoning regions, what if we focused on the identity of place? What if

Such prospects are challenging, but inspiration lies in the possibility. The issues

may be complex – but without new, shared long-term visions of sustainable communities, we can not shed the out-of-date systems and mindsets restraining us. Admittedly, the thesis takes an idealized approach, but it is necessary to **encourage the imagination of forestry communities years ahead**. With this example in mind, we can collectively begin to envision how the rural and remote communities of our nation might live in the future.

LIMITATIONS

Forestry is a large and complex subject matter. Research undertakings address the phenomena of single-industry communities, community forests, forestry tenure, socioeconomic impacts of remote areas, culture and community identity, quality of place, architecture and design, as well as sustainable development. The author does not presume to be an expert in these specific fields, but rather, uses this thesis to synthesize a range of specialized fields not normally explored together as a whole. To achieve this, a methodology is needed to pull together the different fields in order to explore the sustainability of forestry communities in Northern Ontario.

In addition, a lack of current analysis on the built environment in these remote forestry communities – with respect to self-sufficiency, integration with local resources, quality and desirability, community participation, as well as identity and culture – required the author to voice specific observations. Here it was necessary to gauge the opportunity for long-term sustainability of forestry communities in light of the current issues and crises they face. This meant interpreting research, innovation and ideas done elsewhere, while carefully considering the unique conditions and culture of Northern Ontario as seen through the eyes of an ‘outsider’: myself. In response to the very real question – Given the current course, will the *quality of place* in forestry communities endure the next 10 to 50 years? – the thesis seeks out a methodology that addresses the role of architecture in achieving a sustainable quality of place.

Before discussing this methodology however, the author would like to acknowledge two topics not specifically addressed in this thesis, due to its scope. The first is non-renewable resource extraction, such as mining. Although the start-up of small operations in the NSFC region currently relieves some employment-loss, these operations do not resolve long-term instability. The second is the First Nations within the NSFC region, which include Michipicoten, Chapleau Cree, Chapleau Ojibway, Pic Mobert, Ojibway of the Pic River, Missinaibe Cree and Brunswick House. These First Nations are involved in the NSFC regional strategic planning and share a vested interest in new projects, as well as long-term vitality of the region. However, the built environments in these First Nations are not specifically examined.

METHODOLOGY, STRUCTURE & SUPPORT

The research scope and methodology of this thesis is focused on the various elements comprising the *quality of place* in a community that could be reinterpreted through architecture and design to make the whole function in a more sustainable manner. In turn, this is directed at envisioning the long-term sustainability of forestry communities.

The thesis methodology is structured into six chapters to achieve this vision of sustainable forestry communities. Together, the chapters examine, rethink and explore forestry communities and long-term sustainability through architectural and design interventions. Various sources of information were influential during the process of this thesis.

Chapter one situates forestry communities for the reader by providing a contextual understanding of the past and present. Research focuses on the evolution of resource-reliant communities, as well as the common issues they share. *Canadian Resource Towns in Historical Perspective* highlights resource management as the fundamental issue plaguing resource-reliant communities. Accordingly, architectural and design response in this thesis argues for more effective resource integration between community, industry and ecosystems

as a means for sustaining forestry communities. *Small, Rural, and Remote Communities: The Anatomy of Risk* clearly identifies the common issues associated with remote resource communities, while offering a critical assessment of the declining regions in Ontario. In addition, *Public Forests, Public Returns* sheds light on the severity of the current crises surrounding forestry communities. These last two works provide an understanding of very real criteria that must also be addressed.

After discussing the broad conditions shaping forestry communities and identifying the need for new approaches to sustainability, chapter two examines the *quality of place*. A photographic ‘cross-section’ through the townships of Chapleau, Dubreuilville, Hornepayne, Wawa and White River provides a better understanding of the built environment in remote forestry communities. This documentation by the author and digital aerials provided by the *Northern Information Technology Geomatics Cooperative* (NITGC), support later design explorations addressing the quality of place in terms of culture and local identity, responsive living and working environments, as well as more effective resource integration. The *Northeast Superior Forest Community Strategic Plan 2007-2011* outlines a plan from the six townships as well as the seven First Nations in the region, to maintain the regional forestry economy. Based on the momentum of such organized communities, it is apparent that there is potential for broader long-term visions of what community sustainability might look like, including the built environment.

Beginning with a valuation of current attributes and future potential, chapter three assesses the need for sustainable forestry communities. After discussing who is doing what to sustain forestry communities, this chapter recognizes the need to establish more imaginative long-term visions of sustainability. These visions mirror the work of Ben Parfitt, who is a policy analyst, advocating bold initiatives be taken with respect to the unstable future of forestry communities. Here, the chapter turns to the role of architecture and design, suggesting how it can contribute to sustaining forestry communities. In light of this, the work of Brian Edwards in *Rough Guide to Sustainability* highlights the changing role of

design practices in the 21st Century. It considers sustainable design in the built environment as a generator for sustainable development at the community level.

Chapter four proposes the development of a vision for sustainable forestry communities. A framework for self-sufficiency embraces re-thinking the traditional relationship between community, forestry industry and ecological resource base. The chapter looks at a broad range of approaches and sources that substantiate the potential for achieving such a vision. Specifically, the work of Sarah James and Torjborn Lahti in the *Natural Step for Communities*, as well as Oswald and Baccani in the *Netzstadt: Designing the Urban*, are considered in suggesting how specific objectives ought to reconfigure society and the built environment towards sustainability. The analysis and diagrams of resource flows in living environments by Baccini and Oswald is applied to illustrate the more effective resource integration sought by the framework in this chapter. In addition, the focus of James and Lahti on Scandinavian models offers an understanding of the community involvement process towards sustainability, as well as ecological resource flow and integration with the built environment. This particular work inspired the author to visit Sweden to gain a greater understanding of how rural and remote forestry communities operate in similar climatic and geographic conditions to those in Northern Ontario. Through the development of a vision for sustainability in forestry communities, other areas necessitating design attention also emerged. Regional response, construction ecology and the ecology of place also arise as integral to the architectural exploration to follow.

Chapter five seeks to envision a built environment that will emerge if a sustainable framework and principles are adopted. The architectural response is intended to imagine daily life under new far-sighted approaches to sustainability. In this light, the role of architecture and design is discussed in terms of how it can influence decision-making as well as generating places that encourage resident involvement. Specifically, the architectural response is focused on bringing together the ideas of local resource integration, self-

sufficiency and community identity. Influencing these intentions, John McMinn and Marco Polo in *41 to 66°: Regional Responses to Sustainable Architecture in Canada* suggest that sustainability implies more than measured performance – that sustainability is rooted in regional conditions such as climate, geographical context, available resources and cultural values. The emergence of a regional responsive architecture that contributes to community identity is desirable. In addition to this, the idea of ‘vernacular’ should involve the community in the building process. This does not necessarily imply that everyone is involved in the physical construction, but that rather community residents are involved in the building process – from knowledge of local resources flows and integration, to living environments and a daily life that reflects sustainable practices. In support of this, Paul Oliver in *Dwellings, The Vernacular House World Wide* indicates that in many cultures residents are closely related to the building process, expected to have the ability to construct or at least contribute to the process. Aligned with this thinking, architectural response is directed at a built environment that envisions sustainable forestry communities, as well as developing community identity through participation in the process of sustainable design.

The final chapter (chapter six) zooms out in scale, looking at the broad condition of northern provincial communities with respect to future sustainability. This chapter seeks to imagine a re-inhabited boreal north attained with the help of self-sufficiency and appropriate architectural response. As well, it envisions a region where the built environment and daily life are responsive to unique characteristics of place. The need for responsive living environments and approaches to community self-sufficiency in remote resource communities is essential to sustaining such regions in Canada.



Fig. 0.5 Historically, the railway was the primary means of transportation for remote northern communities. What lies ahead for the communities of Northern Ontario? Is there an alternate route?

01

PART I:

01 SITUATING FORESTRY COMMUNITIES

“Long-ignored, politically weak, economically unstable, home to substantial aboriginal populations, these areas have played a significant, if relatively unknown, role in Canada’s history.”

- Morrison and Coates, *The Forgotten North, A History of Canada’s Provincial Norths*

A range of conditions in Northern Ontario previously shaped and continues to shape, the *quality of place* in forestry communities. Although various qualities, issues and crises shared by forestry communities may allow for collective research and analysis, it is critical to keep in mind that each town is unique.

The focus of this chapter is to situate forestry communities. It is intended to provide a succinct summary and contextual understanding of forestry communities for the reader, prepare the reader to openly rethink traditional ways of doing things, and lastly, lay foundation for the responsive design to follow in later chapters. Emphasis is directed at understanding the conditions influencing current living environments, as well as identifying what can be reinterpreted through architecture and design towards more effective integration with ecological systems. This chapter makes a case for the need for sustainable forestry communities by raising three questions: **What are the shared characteristics of built environments in forestry communities? What are the issues? What is the crisis?**

1.1 THE SHARED URBAN CONDITIONS OF FORESTRY COMMUNITIES

The shared ‘urban conditions’ offer insight on how the human ecology of small town forestry communities evolved in Northern Ontario. These fundamental conditions provide a basis for understanding a community’s strengths, the *quality of place*, and what is hindering its prospects for sustainability. Aforementioned in the introduction, forestry communities are associated at a regional and national level through the notion of the “Provincial Norths” or “Mid-Canada”. Coates and Morrison, writing a history of Canada’s Provincial Norths characterize past settlement and development outside of the southern regions:

“Most of the non-natives who came to live in the Provincial Norths cared little for the resulting pattern of underdevelopment and regional exploitation, as they were only sojourners in the sub-Arctic, seeking short-term jobs in the forests, mines, and construction projects, and seldom staying long in the area. The aboriginal people were another matter, for, as wards of the Canadian State, they lacked even the most basic of political rights, and had, try as they might, little ability to influence the course of events. As consequence, the Provincial Norths have developed with little system or view to the future.”¹

Evolution of a forestry town

In Northern Ontario, forestry operations and hence their adjacent company towns, settled along the Canadian Pacific Railroad and later the Canada National railroad lines as westward construction moved across the northern region beginning in the late 19th century.² Mills were located along waterways intersecting the railroad line, both for harnessed power and to run logs in the watercourses. In many cases, non-forestry employment existed solely to support the functioning of the community, and thus traditionally, most towns lived and died by the resource industry.

Over the past century, however, the range of factors such as increased mechanization and production quantities, stumpage fees and regulations by the Ministry of Natural Resources (MNR), free trade agreements, as well as



Fig. 1.1 Logs run down Wakami River in the 1930’s, near Chapleau. Up until the late 1970’s, there were several mills in small towns along the railroad line near Chapleau.

globalization, has meant the consistent disappearance of small forestry-based towns from the rail lines. Most surviving towns often share alternative roles, such as service centers for either the railroad, a major highway, or other smaller, surrounding communities – or some combination of the three. Although many communities have evolved in complexity from the old company-town relationship, the impact of the forestry operation(s) is still significant. The way of life is still inherently tied to forests that surround them.

The built environment

Several characteristics of the built environment in forestry towns suggest potential for design interventions: urban form, ecological resource flow between mill and community, temporality, housing prices, and sense of place.

In their commentary on aspects of the Canadian city-building process, Stelter and Artibise describe the **urban form** of single-industry resource towns (forestry, energy, mining) as transplanted, because the planning processes and land division reflected urban conditions of distant cities.³ (Chapleau is an example of this type of transplanted development – see Fig. 1.2) Even with such “physical and cultural separation” from the greater population, unique approaches and responses to the remote living environment in Northern Ontario lacked in terms of architecture and identity. Instead, the built environment – its style, materials and technology – as well as its residents (the workforce) were imported from great distances. Thus, the origin of urban form in forestry communities is peculiar; despite a close proximity and dependency on the surrounding resources, the towns adopted a faraway urban system and infrastructure, without the advantages of its greater scale. The underpinnings of urban form and the built environment tend to exist to support industry, rather than supporting unique responsive living environments or local identity.

The **ecological resource flow** from the boreal forests to the community is controlled by the current forestry system. In Canada, 93% of forested land is publicly owned Crown land.⁴ The provincial governments, on behalf of the people, set legislation and regulations⁵ for this forested land and in doing so, establish a

Chapleau TOWNSHIP

AERIAL 1:10000

Fig. 1.2 Aerial showing key urban form characteristics:

Town located by river, proximity of forestry operations to community, transplanted 'urban grids' structuring community layout, as well as relation the boreal forest.

LEGEND

RAILROAD LINE (Canadian Pacific Railway)



RAIL STATION



CONNECTION TO REGIONAL HIGHWAY



FORESTRY OPERATION (Sawmill)



PHOTO DOCUMENTATION (See Fig. 2.4)



TRADITIONAL URBAN GRID
- urban form originally implemented



SUBURBAN LAYOUT

- from 1970's to current day, new housing in Chapleau has adopted this type of urban form



0 100 500 m





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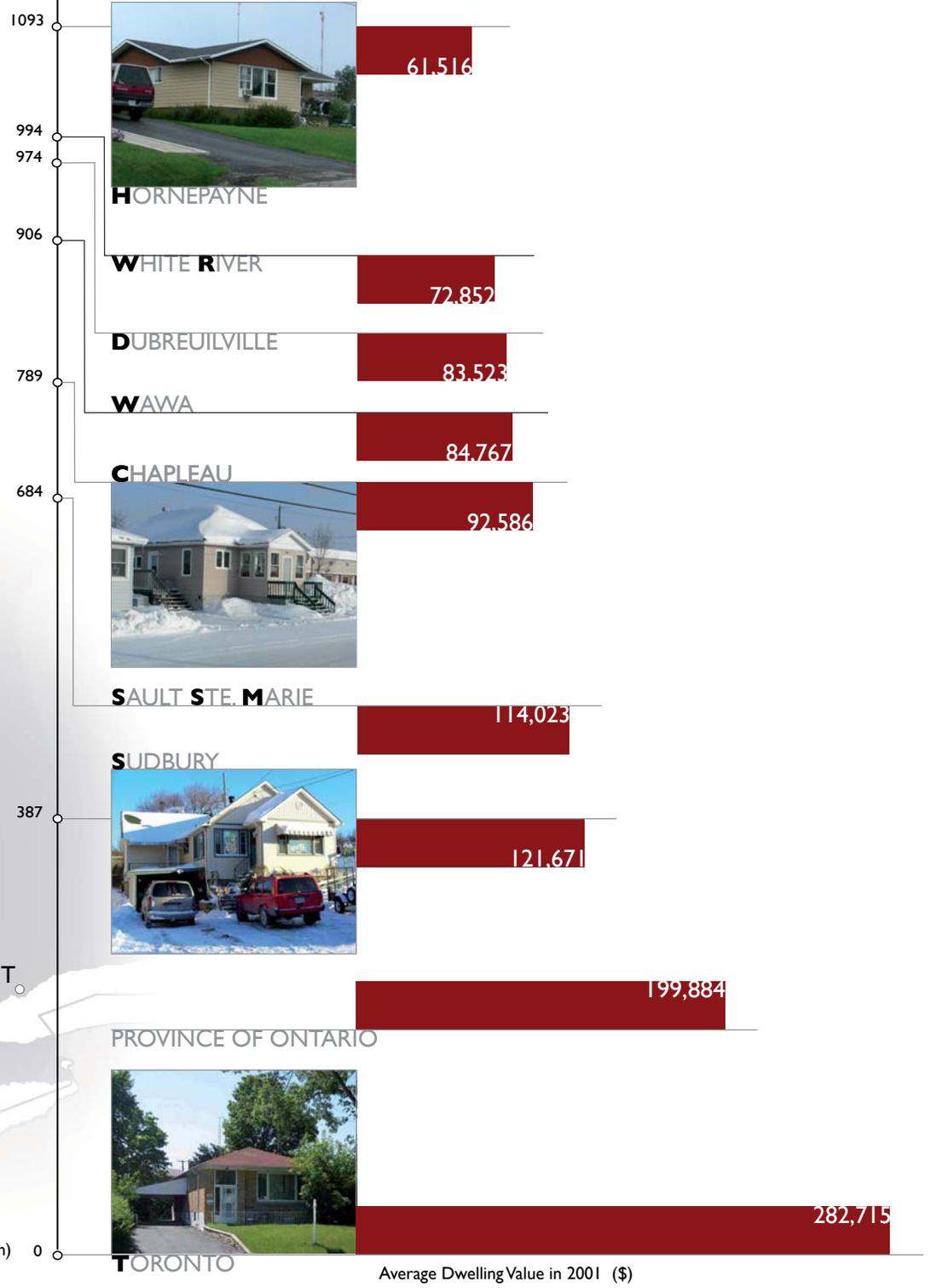
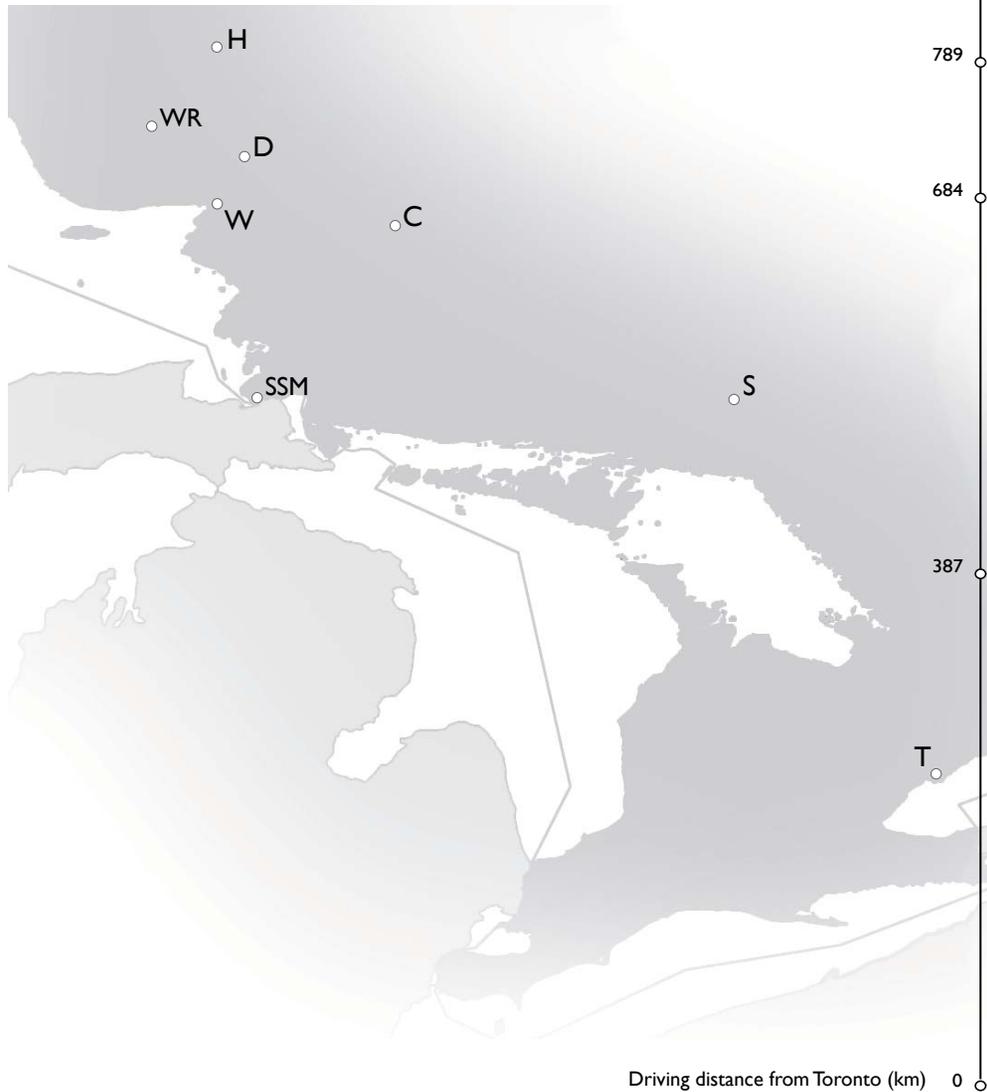
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forestry system. The forestry system allocates land (and its forest resources) to forestry operations to harvest. Here, the resource flow begins with the conversion of ecological capital to economic capital.⁶ Some of this capital flows to the personal income of labourers and in turn, forms the municipal tax-base, which provides public services. The quality of place is shaped by this process, and ultimately, is dependent on the profits of natural resource extraction process – something a community is rarely in control of. Consequently, the quality of housing and community developments are dependent on it as well. Opportunities for more effective, community integrated resource flow through economic and energy infrastructures often go unrealized because daily life is bound to the current resource extraction system. This reliance of a town to its resource industry is outlined by Stelter and Artibise:

*“[R]egardless of the sophistication of recent planning concepts, some of the basic problems facing resource towns remain unresolved. Many have a limited lifetime and prospects for activity and growth ... in some cases the resources simply run out, market conditions change, or an international corporation moves its operations for its own reasons. The results are mine or plants closures and the eventual death of a town. Hundreds, perhaps thousands, of Canadian communities have disappeared this way – and the process continues ... **without a more comprehensive approach to planning in the area of resource management, resource towns will continue to be the most unstable and precarious of Canadian communities.**”⁷*

The volatile state of natural resource industries challenge community permanence and thus, evoke the notion of a **temporal** environment. External economic factors can force the forestry operation to close temporarily or reduce the number of shifts. A lack of control by residents over their own destinies often compels families to relocate for employment in a more stable environment. This uncertainty offers little incentive to invest long-term or re-invest short-term and ultimately affects the quality of place. Under such a temporal mindset, the quality of built environment declines. Compared to areas in Southern Ontario, the **housing prices** in forestry towns are relatively low (See Fig 1.3). The average dwelling value in the NSFC in 2001 was around \$80,000 – considerably lower the Ontario average of 199,884.⁸ Slack,

Fig. 1.3 Indicates the housing values of NSFC townships in relation to the provincial and the metropolis of Toronto. This is just one facet of the “growing north-south divide”. Statistics Canada will not be releasing similar data from the 2006 Census until May, 2008.

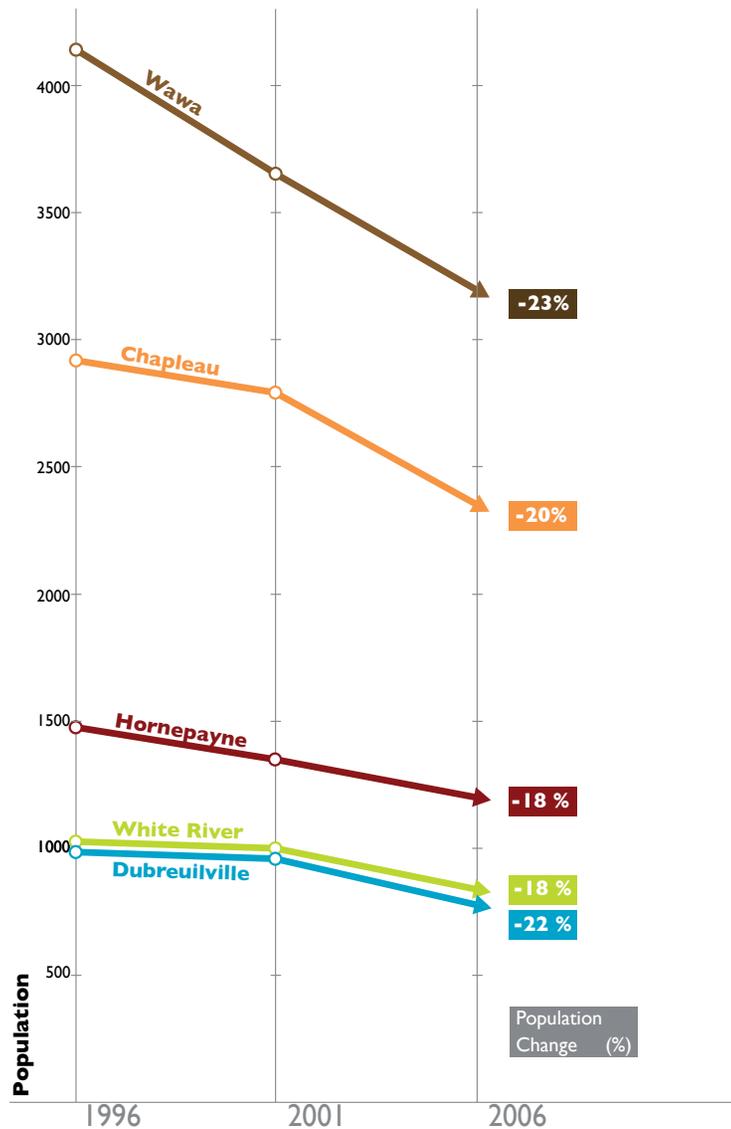


Bourne and Gertler (2003) note construction costs in some communities are even higher than the market value of a newly completed house, pointing out that this “reflects the unwillingness or inability of individuals to pay the price that covers the cost in these communities”.⁹ Furthermore, as the houses in many northern communities continue to age, the rising costs of labour and construction make it difficult to improve the built environment.

Despite various issues hindering sustainability, forestry communities do however naturally afford a sense of place. The scale of the living environment, the nestled community set against vast wilderness, as well as the opportunity for community interaction (a disappearing quality in suburban developments) give the remote communities a strong **sense of place** and connection to the natural environment.

In short, there is opportunity for proactive approaches and design to explore living/working environments and urban form that effectively utilize resource flow, instill a sense of place and permanence, improve investment outlook and desirability of housing in the community.

Fig. 1.4 Populations of the NFSC townships. Note the 20.7% decline in the general population from 1996 to 2006.



1.2 THE ISSUES

In addition to the characteristics of the built environment, there are other specific issues shaping the unique notion of place in Northern Ontario communities. Increasingly, many issues continue to weaken the region, bringing about decline in the *quality of place*; in some communities, continued existence is even at risk. Remote resource-reliant communities present a complex range of issues and strengths unique to the place. To gain perspective, it is important to acknowledge the common issues that have previously been identified.

The outstanding issue that will be addressed in this thesis with respect to northern forestry communities is the **local quality of place**. It is fundamental because the local quality of place is largely tied to built environment, which in some form is the accumulation of architecture and design. As population declines, the care of the quality of place inevitably declines as well. The issue at hand is raised by several sources. It emerges from the peoples voice in the document entitled *Forging the Future*, initiated by group representing Northwestern Ontario. Facing similar issues as the NSFC, they indicate that economic growth relies on in-migration and repopulation, specifically, the “continued arrival of skilled and professional newcomers and foreign investment.” As well, the communities state that “Incentives are needed to ensure the influx of new business opportunities and the stabilization and eventual expansion of the population.”¹⁰ In other words, what new quality of place and lifestyle will convince people to in-migrate into regions where the population is in decline?

An analysis on remote and rural communities by Enid Slack, Larry Bourne and Meric Gertler (2003) – experts in municipal finance, urban planning and housing markets, as well as economic development policy and planning, respectively – reaffirms the need to address the issue of quality of place stating “relative scarcity of amenities and consequent limitations on **local quality of place** make the attraction and retention of talented labour all the more difficult.” As a result in the communities, “the locally generated labour supply often lacks diversity and depth, due to selective out-migration of many of the most highly

educated and skilled workers.”¹¹ The role of the quality of place as a potential contributor to the continued out-migration of the NSFC regional population marks a primary objective of the thesis work: to enhance the built environment in a manner that encourages self-sufficiency, confidence and desirability towards long-term community sustainability.

Slack, Bourne and Gertler also offer several industry-related points as to why smaller, economically specialized communities, geographically isolated from larger metropolitan areas or large cities are at risk. These points need to be overcome for greater local economic diversity:

- *Overly dependent on one or a few sectors*
- *Limited investment capital*
- *Production and investment decisions tend to be controlled by non-residents.*
- *Absence of a critical mass of firms in the same or related sectors means that specialized local services and infrastructure to support employers are usually in short supply, adding to the cost and difficulty of local production.*
- *A decline in the demand for, or prices of, their limited range of projects, or depletion of the resource stock on which they are dependent, can have immediate and devastating effects.*¹²

The key point with respect to local economic diversification is rethinking the notion of ‘controlled by non-residents’. Sustainability is rooted in autonomy or self-sufficiency. The ability to choose the process that best sustains the community (by the community) is essential to fundamental community self-sufficiency. As well, the way in which the local ecological resource base is utilized is integral to community function. These same ideas of local control and local self-sufficiency can be connected to other issues – commercial, political and social – that continue to challenge remote communities. Increased community self-sufficiency not only begins to equalize these issues, but also can diversify employment opportunities. These same sentiments are echoed in additional research analysis by Slack, Bourne and Gertler as follows:

- *Remoteness implies many things, but by definition it means an increase in the costs and difficulties in transportation, construction and the provision of services.*
- *A premium for almost all goods in remote communities due to higher transportation costs and/or limited local competition in the retail sector.*
- *Isolation of potential employers from suppliers and markets.*
- *A relative lack of access to opportunities, especially jobs, and to social and consumer services, especially specialized services.*
- *Residents can not substitute employment by commuting to another nearby community because it is too far away, or transportation connections are poor or too expensive [resulting in out-migration from the communities].*
- *Social challenges include effects of economic restructuring [mill slow-downs or closure] on employment and income opportunities, population decline and aging demographic.*
- *On the revenue side, small rural and remote areas do not generally have sufficient capacity to finance local expenditures.*
- *The characteristics of the population and the tax base in remote areas restrict the use of many of these revenue sources.¹³*

In addition, regions of Northern Ontario lack the political and societal attention of the rest of province due to relative population discrepancy, geographical isolation and media separation, as well as disproportionate political representation with respect to geographical area. Plans for economic development, as well as community and regional improvements, are often fragmented by the various levels of government, a lack of genuine buy-in and participation from all the necessary interest groups and lastly, inadequate resources (funding, expertise, labour) needed to realize ambitious projects.

Acknowledging and understanding the issues remote resource-reliant communities face is critical; equally, if not more critical, is the need to begin thinking about how innovative changes to traditional community systems might enhance sustainability and the quality of place.

I.3 THE CRISIS

“Communities are literally losing their economic foundation, which is putting basic infrastructure (roads, schools, etc.) at risk. As mills close and infrastructure declines, smaller communities are less able to attract new residents and businesses, real estates values drop, more businesses close, and there are upswings in family troubles and crime.”¹⁴

In Ontario since January 2003, the impact was a total of 61 mill closures (44 permanent, 17 temporary) with 7,937 layoffs.¹⁵ The growing numbers prompted an article in the Globe and Mail on November 29, 2007 to state with respect to closures that “[forestry operations] will continue to do so for months to come ... There is no end in sight.”¹⁶ **The obsolescence of the decentralized network of forestry operations is a crisis.** With it, looms the disappearance of regional identity across Northern Ontario and a declining quality of place. This crisis has been fuelled by the rising Canadian dollar, the dwindling quality of available boreal forest resources, the growth of other competing suppliers such as China and South America boosted by shorter growing cycles than northern climates, a lack of research and development, aging infrastructure, and finally, rising energy costs.¹⁷ Dependency on an outdated forestry system has **forestry communities in desperate need of a more stabilized environment.** It is a pivotal time in Northern Ontario for many individuals and communities; their way of life is at a crossroads. Forestry employees and their families desire to stay in their communities. But should they wait for the industry to recover? Do they move elsewhere looking to resume their livelihood in a more stable environment? In many single-industry towns, the closing of the forestry operation raises uncertainty about the future survival of the town. There is much at stake. What do we do when these communities are gone?

If the “production of wealth in Canada as a whole has been and remains dependent on resource extraction”¹⁸, and the communities ‘care-taking’ one of the country’s two renewable natural resources (forestry and agriculture) can no longer survive, then surely the systems ensuring a long-term, sustainable economy need to be revisited.

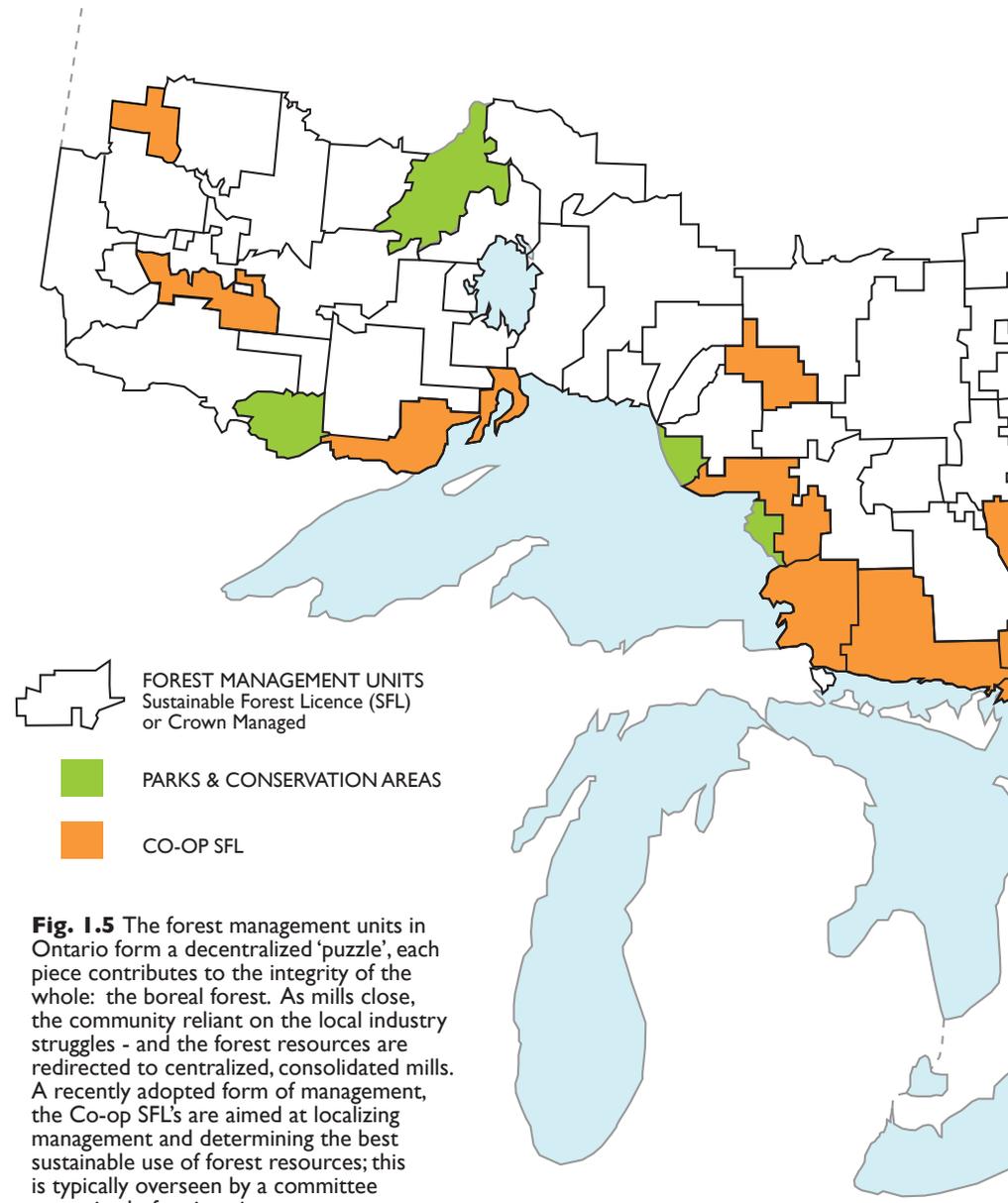
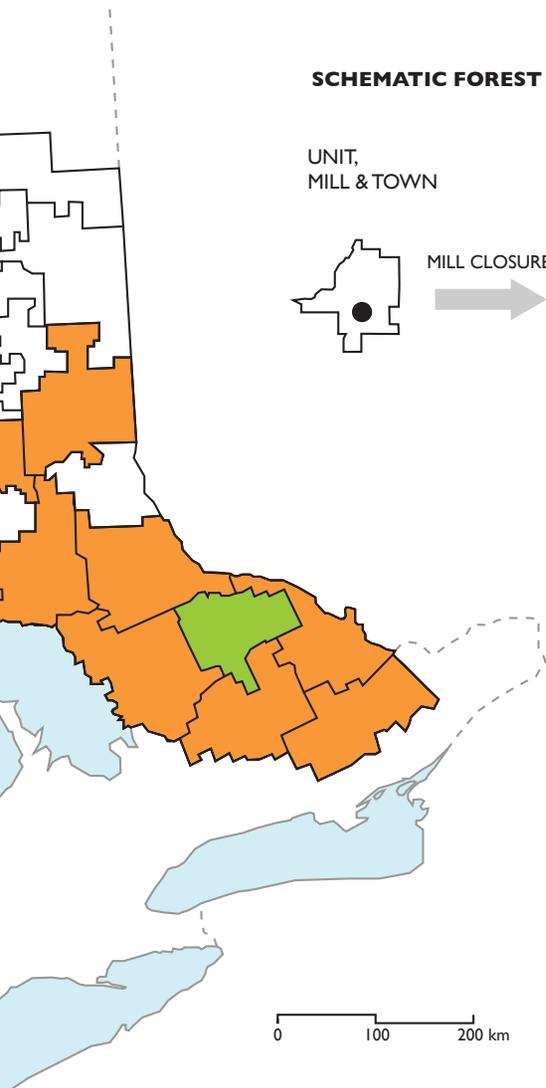


Fig. 1.5 The forest management units in Ontario form a decentralized ‘puzzle’, each piece contributes to the integrity of the whole: the boreal forest. As mills close, the community reliant on the local industry struggles - and the forest resources are redirected to centralized, consolidated mills. A recently adopted form of management, the Co-op SFL’s are aimed at localizing management and determining the best sustainable use of forest resources; this is typically overseen by a committee comprised of various interest groups.



SCHEMATIC FOREST RESOURCE FLOW



What does the country want long-term for its forestry community system?

Option A - Allow communities to continue to depopulate and decline under the traditional system, where the prospects for profit (and thus the *quality of place*) are dwindling.

Option B - Develop a system that encourages a diversified sustainable economy, community self-sufficiency, as well as a desirable quality of place and lifestyle unique to regionally responsive, low ecological impact living environments of Northern Ontario.

One would assume, that most would answer the question with Option B. How to immediately get to this stage, however, is not apparent. It is a transition that requires a long-term vision valuing cultural, ecological, social and political aspects as well as the economic base. The key is to collectively look past the current crisis and envision long-term. For example, what do we want a forestry community system to look like in 50 years? Here, design can help those involved visualize a desired outcome, then trace the process back and better understand the steps it would take to achieve that vision. These steps would offer short-term goals and a path forward to achieve Option B.

With respect to forestry communities in Northern Ontario, envisioning what the built environment might look like in the future is not commonplace. This is largely due to a lack of design-based attention on or in the region. The majority of architects, planners and designers tend to be located in metropolitan areas in the southern parts of the province, with most of the visionary thinking currently focused on ecologically sensible approaches to densification and appropriate growth in that region. Albeit the populations of the forestry communities are relatively small, the crisis at hand still necessitates thinking 'outside of the box' and envisioning unique forms of community living that are sustainable in the context of a new forest economy. The more design-based disciplines become involved, the more likely creative solutions will emerge.

02

02 NORTHEAST SUPERIOR FORESTRY COMMUNITY: A CASE STUDY

This section is intended to provide further analysis on the urban conditions in forestry communities discussed in Chapter 1. In addition to a more comprehensive discussion of the NSFC, a cross-section of photographs from the townships of Chapleau, Dubreuilville, Hornepayne, Wawa and White River provide illustrated examples of built environments in the region's forestry communities. The objective of the documentation is to allow the reader to gauge the quality and sense of place, local and/or architectural identity, cultural aspirations, the potential for new design responses, as well as the daily life in a given community. The aerial images of the towns provide a view of the urban form.

2.1 SURVEYING THE PAST

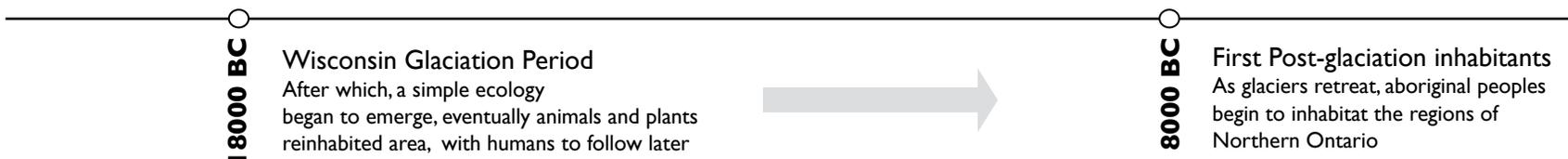
In Canada, the search for and extraction of natural resources has dictated past settlement patterns across the vast landscape. The demand for particular resources in conjunction with improving transportation technology, has changed the morphology (structure or form) of many regions across Canada. This morphological evolution is critical to understanding the development of resource towns; it is identifiable in the evolution of the Northeast Superior region, illustrated below in the series of six diagrams. The sequence is intended to encourage future speculation: with the forestry systems of industrial era failing in this region, what will regional settlements look like in 2050? Are the possible outcomes desirable? Might new approaches to natural resource extraction lead to a different result?

Fig. 2.1 A schematic illustrating the morphological evolution of resource extraction the NSFC region. Key literature sources in comprising this section were *At the End of the Shift*, *The Forgotten North*, as well as *Land of the Big Goose*, *A History of Wawa and the Michipicoten Area*.

HUNTER-GATHERERS

Cree/Ojibwa groups native to Shield region

Prior to the arrival of the Europeans, the key characteristic of native groups in the region was their 'adaptability.' Northern ecosystems demanded quick response to changing climatic conditions and available resource capacity for a given population. The groups were able to do this because 'relative absence of material possessions, sophisticated means of transportation, ability to live off the land, and ease of constructing new shelters'.¹



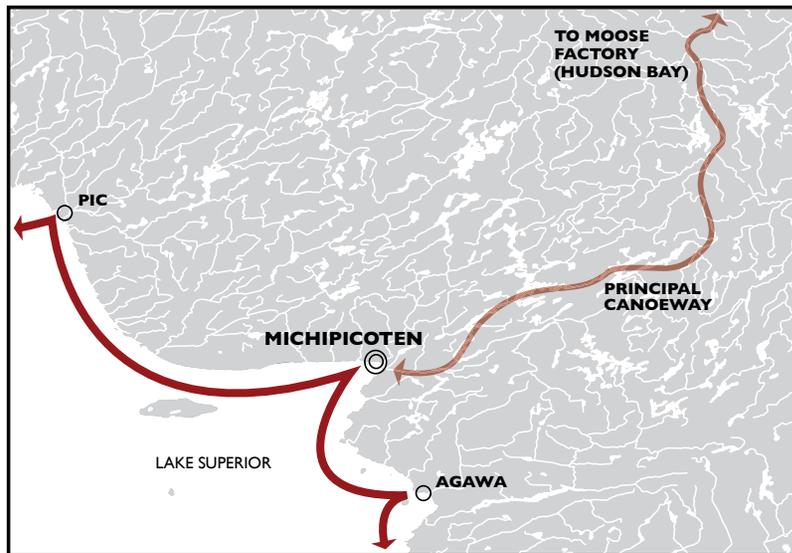
FUR TRADE

Michipicoten

Michipicoten served as the 'hub' between east, west and north, part of the cross-canada canoe route and a connection to Hudson Bay. The **waterways** were key to trade and survival.



CANOE



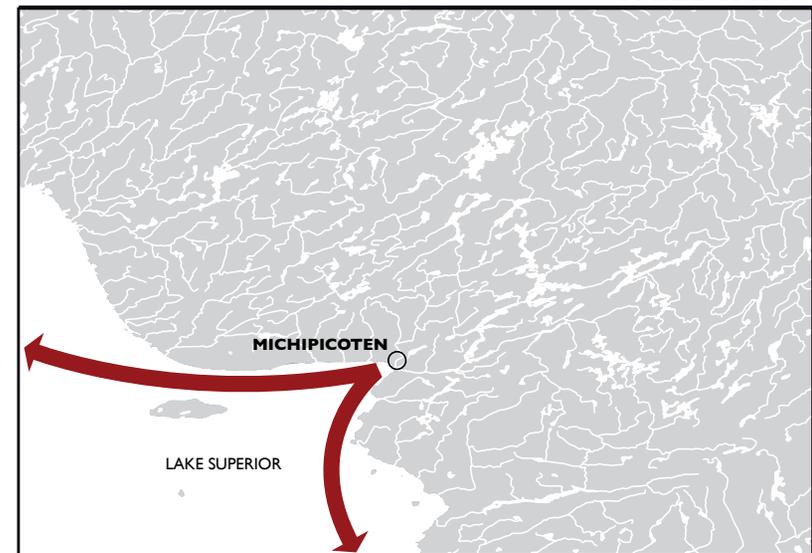
IRON ORE MINING

Michipicoten

The introduction of the larger watercraft made it feasible to later ship ore down to Sault Ste. Marie, increase trade volumes and passenger transport across Lake Superior.



STEAMSHIPS & SAILBOATS



1723 French establish post in Michipicoten based on its ideal geographical location - 'supplies were shipped out and furs picked up'

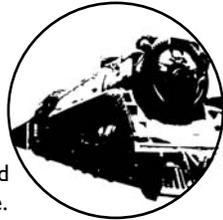
1823 Hudson Bay Company established a trading post at Michipicoten until 1887. Increasing use of larger boats during this period.

1887 Gold, iron, zinc, lead, nickel, silver, copper are some of the minerals in the NSFC area. Emerging technology allowed mining extraction, adjacent towns and transportation to and from be located in even more remote locations.

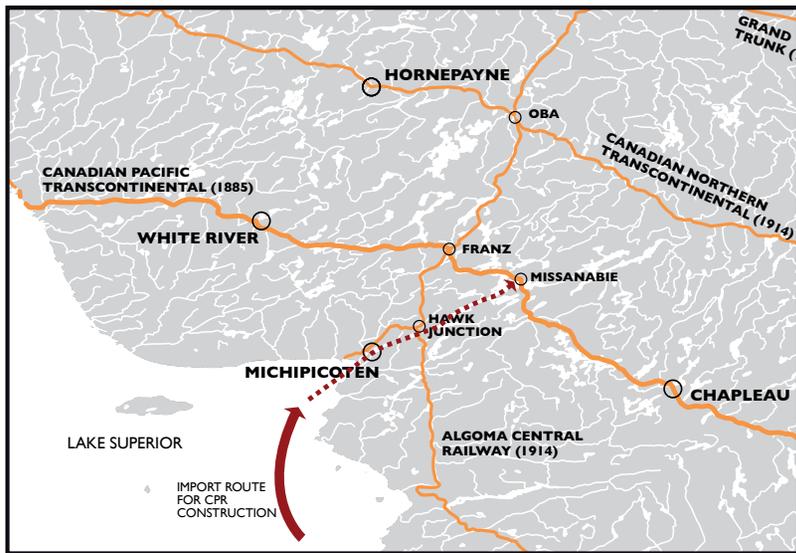
Fig. 2.1 Continued.

THE RAILROADS

3 railroads cross through the NSFC
 '85% of all communities in Northern Ontario were founded between 1880-1920, practically all of them on a railway line. The railways not only traversed the area, they created their own communities within it and made others possible.'²



TRAIN



1882

Canadian Pacific Railway
 The construction of the CPR brought imported supplies through the port of Michipicoten. The railways and future roadways also brought on the eventual disappearance of the port. Chapleau and White River were established as division points along the CPR, and settlement followed.

1900

Helen Iron Mine
 Near Michipicoten 1898-1918 Demanded enlargement of port.

1914

Two other railways, the CNR and ACR were completed by 1914 through the NSFC. Hornepayne division point.

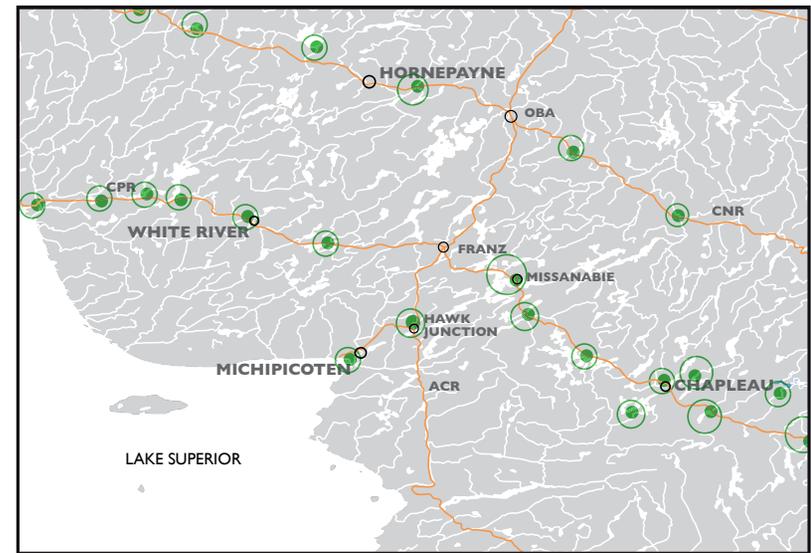
EARLY FORESTRY

River run logging

The earlier forms of forestry used the rivers to transport the logs. The sawmills were located nearby through a spur or on the railway where it bisected a waterway.



RIVER/TRACTOR

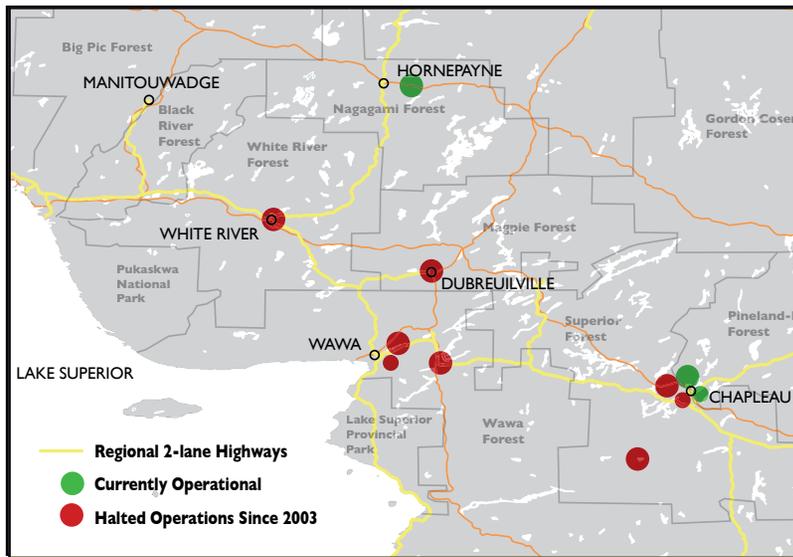


Early forestry
 was limited to easily accessible stands of trees. The older growth, taller stands accessible through this initial system of forestry would be exhausted. The slow growth cycle of a tree in the boreal forest peaks at 70 to 100 years.

CURRENT FORESTRY

Trucks and logging roads

allowed operations to reach less accessible timber stands. Rising fuel prices & other factors threaten the profitability of this structure. Outlined on map are Sustainable Forestry Licensed (SFL) areas, which are tenured out to forestry operations. **TRUCK**

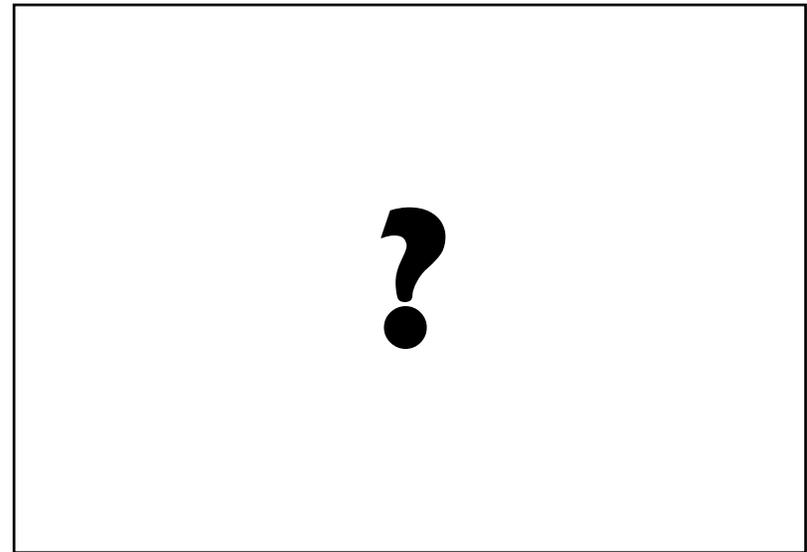


THE FUTURE ?



The era of sustainable approaches

What new organizational patterns will emerge in this region with respect to future resource extraction? What will be the state of NSFC communities in the 2050?



1951 Dubreuilville
Four brothers establish forestry operation. Township is incorporated in 1961.

1951

1955

1955 Manitouwadge
Construction begins on new mining community to support extraction of copper/zinc from nearby ore.³

1960

1960 Trans-Canada highway
Named the 'Lakeshore highway', the last segment on the first road connecting Sault Ste. Marie to Thunder Bay is completed.

2008

2008 Forestry
The consolidation of mills/towns and the current crisis are both noticeable. Halted operations represent a loss of ecological/economic flow that has impacted at least 25% of the people region.⁴

2050

2.2 SURVEYING THE PRESENT

There are aspects of a community that are difficult to photograph but remain important in constructing an understanding of place. Understandably, the characteristics of community residents have evolved with the built environment, employment type, climate and geographic location, as well as culture. While each community is unique, these communities do share common characteristics. This section focuses on characteristics that are relevant to architecture, design and envisioning new models of community sustainability. The key points discussed are: living environments, enhancing an aging built environment, developing entrepreneurial potential and innovation, culture and identity, as well as a new daily life and working towards self-sufficiency.

Living environments

A living environment is synonymous with quality of place; it describes the different environments in which we dwell. For many residents of remote forestry communities, the boreal forests provide an extended living environment. Not only are forests the backbone of local economies, but forests also provide grounds for recreational activities taken up by many residents such as fishing, snowmobiling and hunting. In addition, many residents have summer cottages or 'camps', often under 30 or 40 miles away – a scenario uncommon in Southern Ontario. Some residents choose a hybrid living environment, residing just outside of town. The way of life in forestry communities is very much tied to their surrounding natural environment.

Within township boundaries, the low housing density reflects the perception of available space. The private lots in most municipal layouts contain primarily single-detached homes. This indicates that residents want their own home. The housing styles often illustrate that residents of remote communities don't want to be viewed as 'different' from the rest of Ontario, as materials and forms appear to be transplanted from southern Ontario. Today, many of the houses in forestry communities are aging. The quality of built environment has entered a pivotal era.



Fig. 2.2 An addition to a small house, during construction. Illustrates desire of residents to improve living environment.

Enhancing an aging built environment

Aforementioned in Chapter 1, a sense of temporality is brought on by the instability of the forestry industry. A temporary or permanent closure of a mill typically lowers housing market values in that particular community. It also inevitably leads to out-migration of some families or individuals in search of a more stable living environment. The result is vacancy in single-detached homes. However, this does not last. The lower values allow residents living in apartments or other housing types to purchase a small, single-detached 'starter' home.⁵ Those in the 'starter' homes might look to purchase larger homes. In addition to this process of upgrading house type, the residents often desire to upgrade the quality of the house.⁶ All the while, residents do so accepting the risk that the market value of their new home may fall well below what they paid for it. Finally, there are also residents who are unsatisfied with the aging homes available, and they desire an entirely new home.

This desire for newer, quality living environments is a characteristic likely to be ever-present in society, regardless whether the prospective buyer lives in either Chapleau or Mississauga. It is worrisome however, that in forestry communities, so close to the origins of wood construction (a fundamental building resource in the Canadian climate) must bear disproportionate costs for construction. This worsens the outlook for an aging built environment, while it also makes it more difficult to attract new individuals or families to the region. Part of the problem is the cost of transporting the materials, but the cost of quality labour is the critical issue.⁷ With respect to forestry communities, high cost construction costs call for new approaches to the construction of public and private living environments.

In response to the need for quality homes that offer a sense of private place, as well as new local construction strategies that are more cost effective, **new living environments more responsive to the place should be sought.** If new living environments in terms of density are to be proposed in forestry towns, they need to be high quality and superior to those in larger cities. Any increases to density (for infrastructural/energy purposes) must offer

a convincing argument to the residents such as considerably lower heating costs, new forms of living spaces, as well as more comfort. In addition, a new push for local materials and aesthetic must also be embraced by residents. The specifics of energy-based and material-based transitions will be more closely examined in Section 4.3 Integration, Inventory and Resource Flow.

Developing entrepreneurial potential and innovation

History indicates that residents of forestry communities are generally not entrepreneurs by nature; they are traditional labourers that enjoy their time off.⁸ This could be the result of non-local control of resources limiting the development of entrepreneurial initiatives and/or the selected out-migration of the skilled and highly educated individuals.⁹

How might this change? Identified in the NSFC strategic plan for 2007-2011, a keystone to building sustainable economic models is educating citizens on opportunities, entrepreneurial potential, as well as capacity building with respect to innovative uses of local forest resources.¹⁰ At both regional and community levels, Economic Development Corporations offer support for entrepreneurial initiatives; as well, through the provincial and federal governments, they offer financial incentives for these new initiatives. In terms of long-term economic sustainability, the region seeks to develop more knowledge-based initiatives as well as form networks to connect innovative development at regional and global levels.¹¹

The NSFC also believes that innovation and change, as well as entrepreneurial skills, must begin at an earlier age. A sensible goal: provide the youth with new learning opportunities and the capacity for innovation¹², while also empowering them with the long-term future of the region. At the moment, this is difficult because the most highly educated youth are leaving these communities for broader opportunities in urban centers. **To capture the interest of the youth, there must be challenging and creative environments to build capacity for design and innovation with respect to local forest resources.**





Culture and identity

The scale of the smaller communities equates to events that involve participation from most of the community in one form or another. Thus, these events are a source of community identity as well as regional identity, as they often bring nearby communities together. Cultural events such as fishing derby's, art exhibitions and festivals are common. Like most initiatives, these events often hinge on the dedication and volunteering of a few individuals year after year. The occurrence of cultural events or lack thereof, may in fact be a gauge of community moral. In addition, backgrounds of the First Nations, French and English historically provide three streams of culture woven together in the region.

A new daily life – working towards a sustainable future

A new lifestyle is not appealing to everyone. Many small communities have families now settled for several generations and they have grown accustomed to a way of life. The lifestyle in these smaller remote communities however, is not appealing to everyone. The long-term prospects associated with this lifestyle are not attractive to many young adults, as shown buy the out-migration of youth (ages 0-29) which has declined by 32 %, from 1996 to 2004.¹³ These individuals, who would be armed with a more locally directed education, creativity and a newfound capacity for local resource innovation as proposed by the NSFC, **could be the leaders of new approaches to community living.** The push for a new daily life, based on a more sustainable long-term outlook, will rely largely on the younger generation. The opportunity for this shift, however, depends on the willingness of the older generations to participate and buy into a long-term outlook.



Fig. 2.3 The Nature Festival in Chapleau. Although this summer event has not been held the past couple of years, the community did host 'Taste of the North: Chapleau Winter Carnival' in 2008. Facing page, bottom left, Quatrain Arts initiative; several murals painted by local artists and professionals are permanently on display around community. Both events generate local identity.



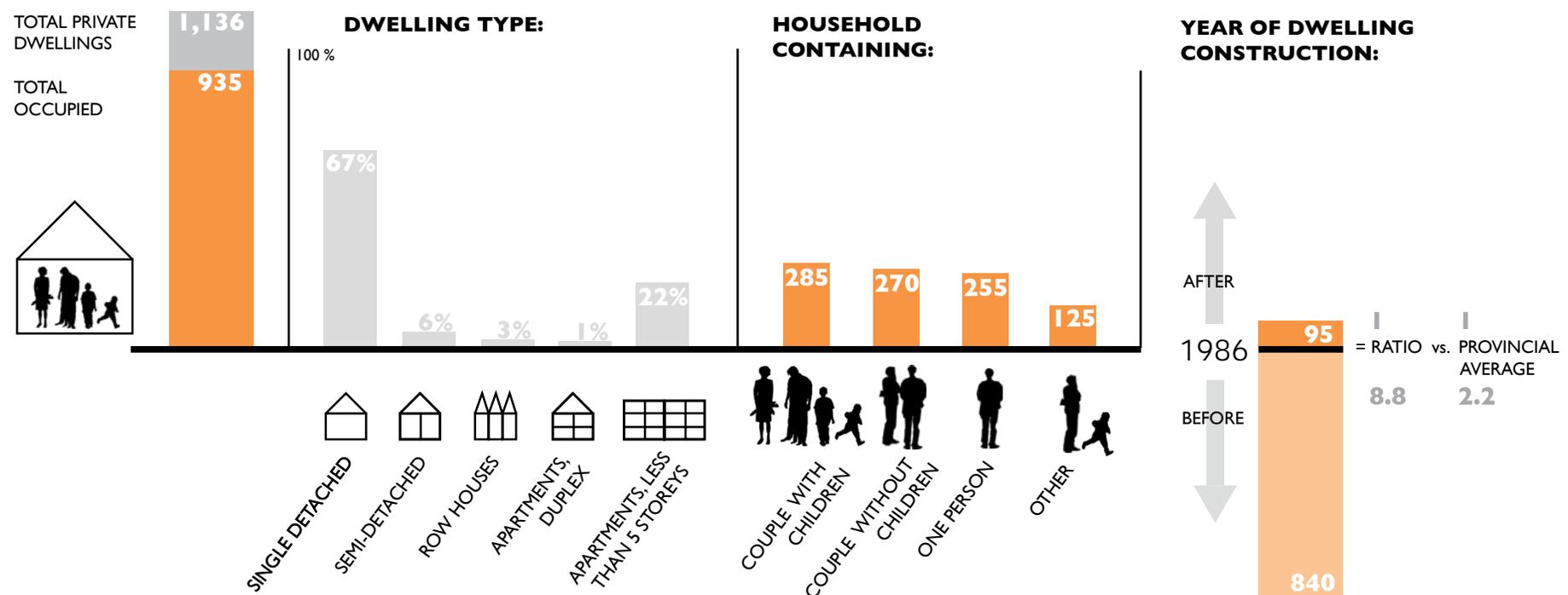
3

View from pedestrian bridge with curve into the main commercial street in the right side of the photo.

Fig. 2.4 Photo documentation and housing statistics, Chapleau. Views located on aerial (Fig. 1.2).

Chapleau

DWELLING the numbers 2006





4

View of french/catholic high school. Illustrates proximity of townships to



5

Main commercial street. Population decline adversely affects small businesses.

The Legion is in the foreground; it is also the last 'bar' in Chapleau. Along with the church in the background, this image gives a sense of the traditional brick masonry architecture that largely comprises the identity of the built environment.

6



Women gathered at a park overlooking the river.

7



Dubreuilville TOWNSHIP

AERIAL 1:10000

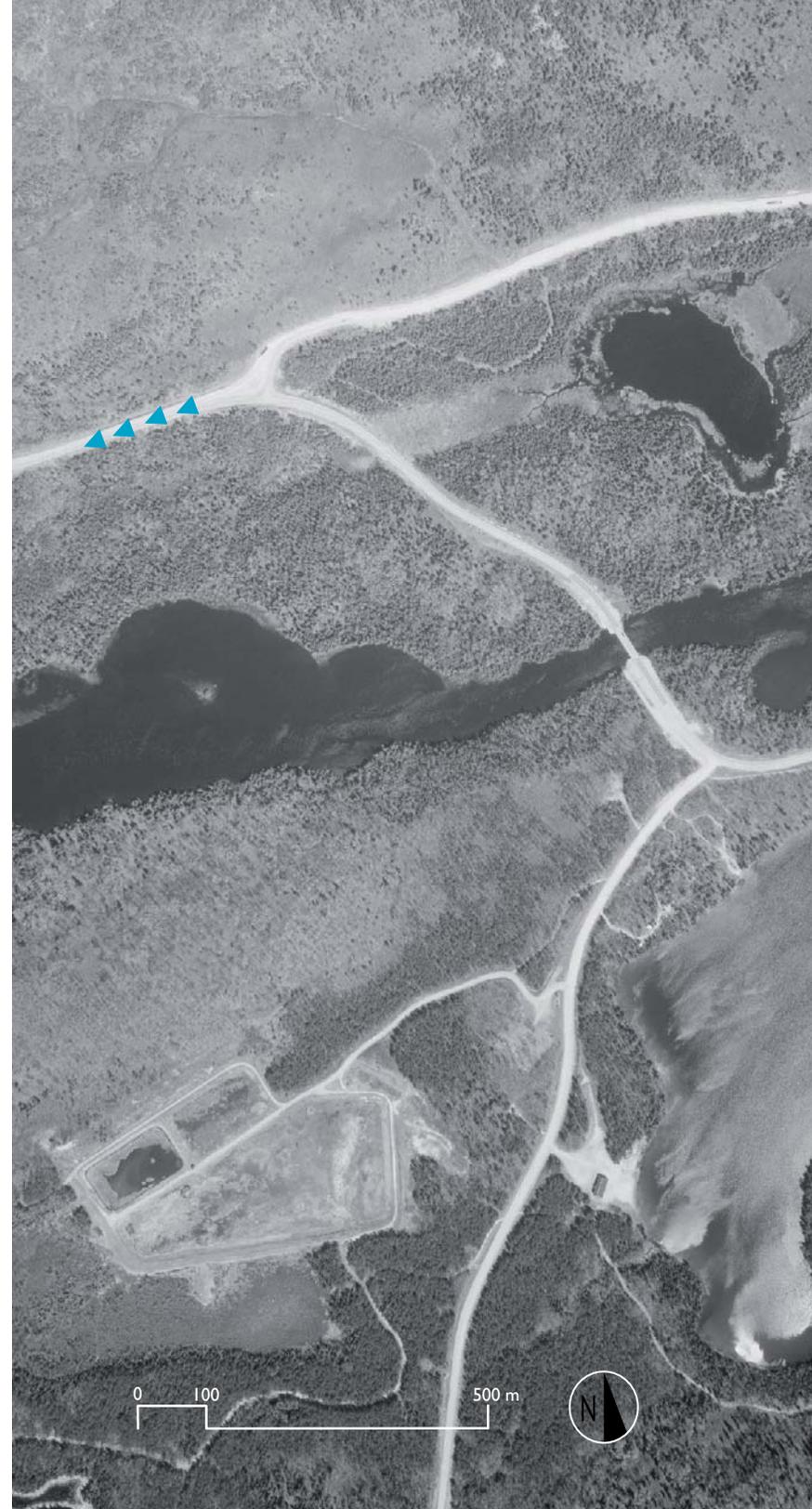
Fig. 2.5

LEGEND

- RAILROAD LINE** (Algoma Central Railway) 
- REGIONAL ROAD TO TRANS-CANADA HIGHWAY** (30 km drive west to reach highway) 
- FORESTRY OPERATION:** Sawmill & composite board
STATUS: Operations halted 
- PHOTO DOCUMENTATION** (See Fig. 2.6) 

To the left, the municipal offices and other community services. To the right, a restaurant on the bottom floor with apartments above.

1





1

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3

2

4



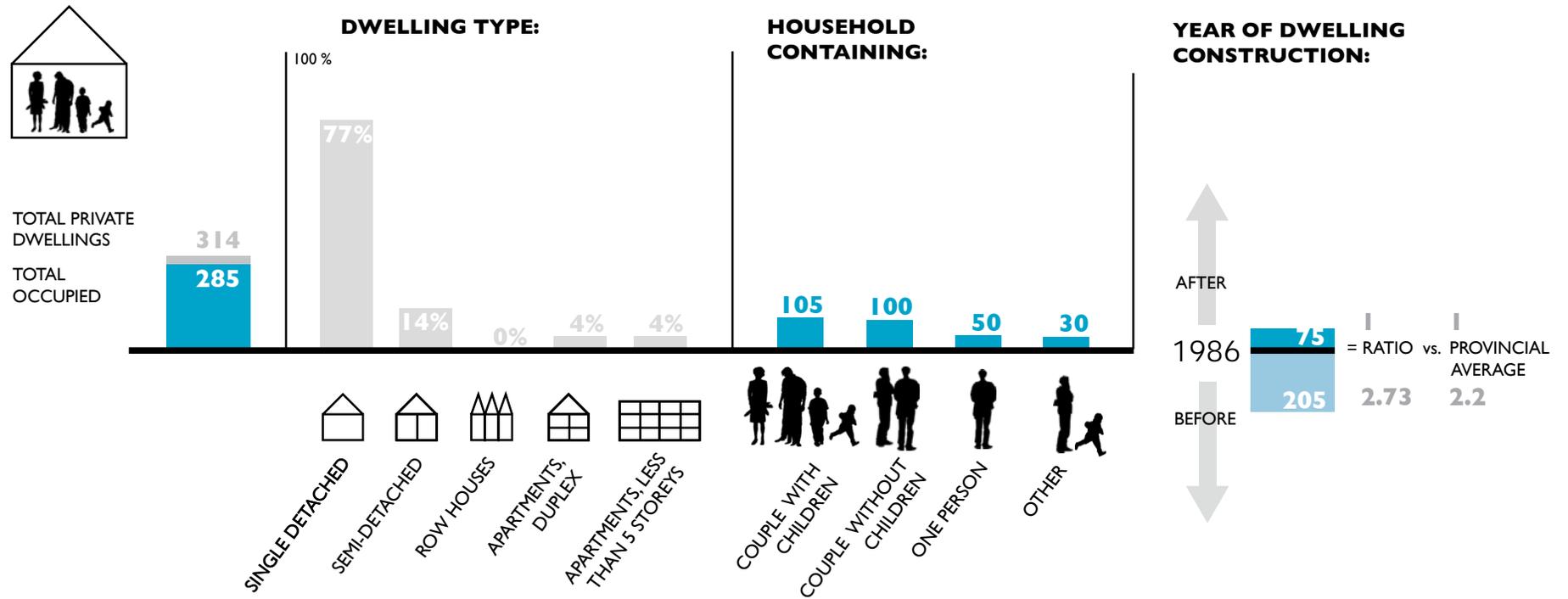
Fig. 2.6 Photo documentation and housing statistics, Dubreuilville. Views located on aerial (Fig. 2.5).

2

View of the recreation centre to the left, a small park in the middle, and the elementary school to the far right. These are key institutions for youth.

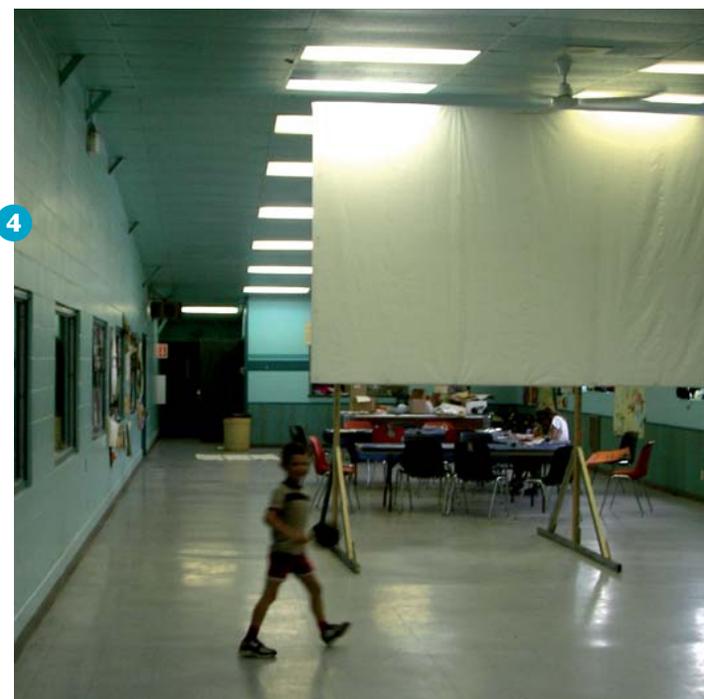
Dubreuilville

DWELLING the numbers 2006





3 A typical residential streetscape. Size of bungalows reflects resident's values: functionality of housing, as well as focus on lifestyles activities (outdoor sporting such as ATVs, snowmobiling and nearby camps).



4 Interior view of recreation centre. Make-shift white screen for community movie viewings; initiated by a youth.

A view of residential fabric from afar showing primarily single-detached bungalow typology; construction of high school in foreground.



5

Hornepayne TOWNSHIP

AERIAL 1:10000

Fig. 2.7

LEGEND

| | |
|--|---------|
| RAILROAD LINE (Hornepayne is a division point for Canadian National Railway) | ■ ■ ■ ■ |
| RAIL YARD & STATION, CP OPERATIONS | ⊙ |
| REGIONAL ROAD TO TRANS-CANADA HIGHWAY (99 km drive south to the highway) | ◀◀◀◀ |
| FORESTRY OPERATION: Sawmill (located outside of town) STATUS: Operational | |
| PHOTO DOCUMENTATION (See Fig. 2.8) | ② ③ ④ ⑤ |



1 View towards Hallmark Hornepayne Centre designed as 'a town under one roof' and at the time, a model for Northern Ontario. The large 160,000 sq. ft. building, completed in 1980, contains a restaurant and sports bar, post office, commercial stores, bank, LCBO, an inn, the public library, OPP office, dental and health offices, CN lodging, town swimming pool, high school and gymnasium, youth centre, senior citizens's apartment as well as apartments.



3

5

1

4

2

0 100 500 m



45



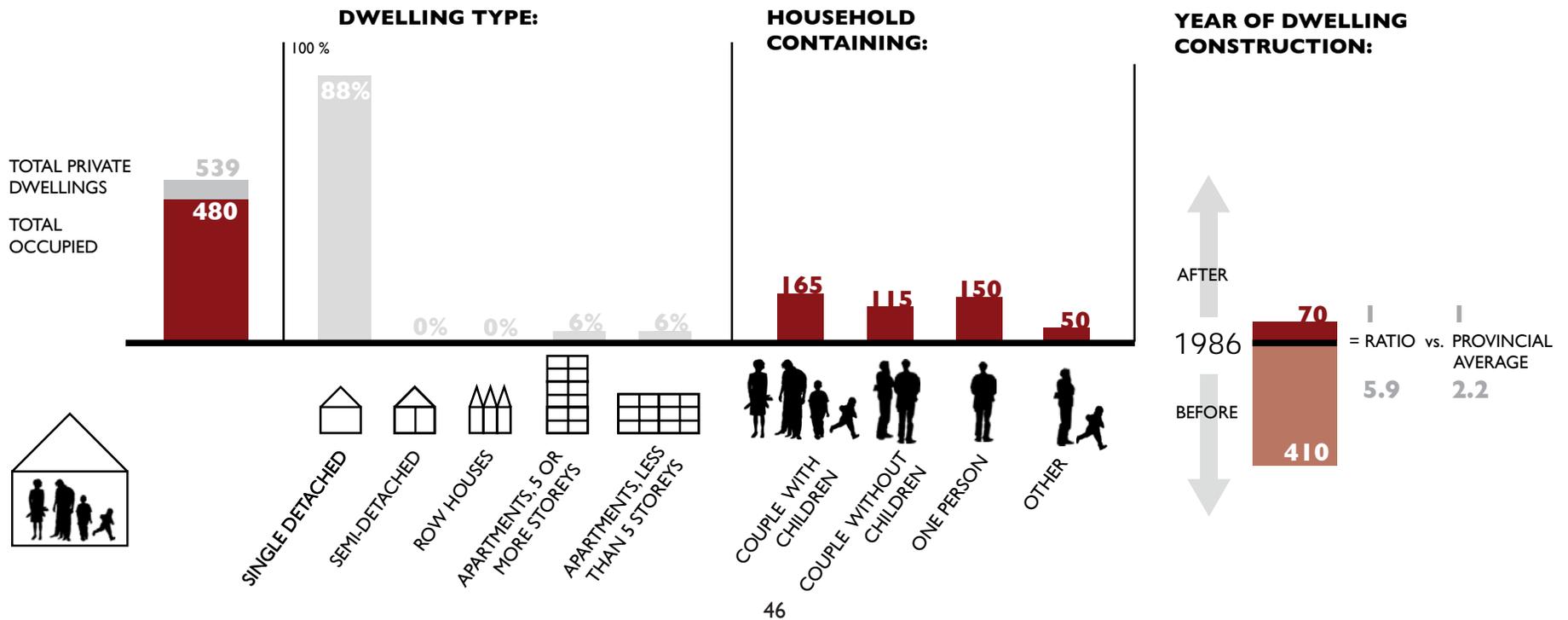
Fig. 2.8 Photo documentation and housing statistics, Hornepayne. Views located on aerial (Fig. 2.7).

2

Right, a view of Hallmark Hornepayne Centre, specifically the entrance to high school. The CN tracks running through town reflect its major role as an employer; Hornepayne serves as a division point on the railroad. To the left, a baseball field and community park.

Hornepayne

DWELLING the numbers 2006





3 Summer daycare outside the elementary school.



4 View of senior citizen apartments with the inn/hotel in the background.



View of the residential fabric. **5**

Wawa TOWNSHIP

AERIAL 1:10000

Fig. 2.9

LEGEND

RAILROAD LINE (Algoma Central Railway)- 15km east

RAIL STATION (Nearest Station Hawk Junction - 15 km northeast)

CONNECTION TO TRANS-CANADA HIGHWAY (1 km) ◀◀◀

TRANS-CANADA HIGHWAY ■■■■■

FORESTRY OPERATIONS

STATUS: (3 operations have halted operations in the Wawa area since 2003)

PHOTO DOCUMENTATION (See Fig. 2.10) ② ③ ④ ⑤



I View down Wawa Lake. The unique natural setting Wawa and other NSFC communities contributes to unique living environments.

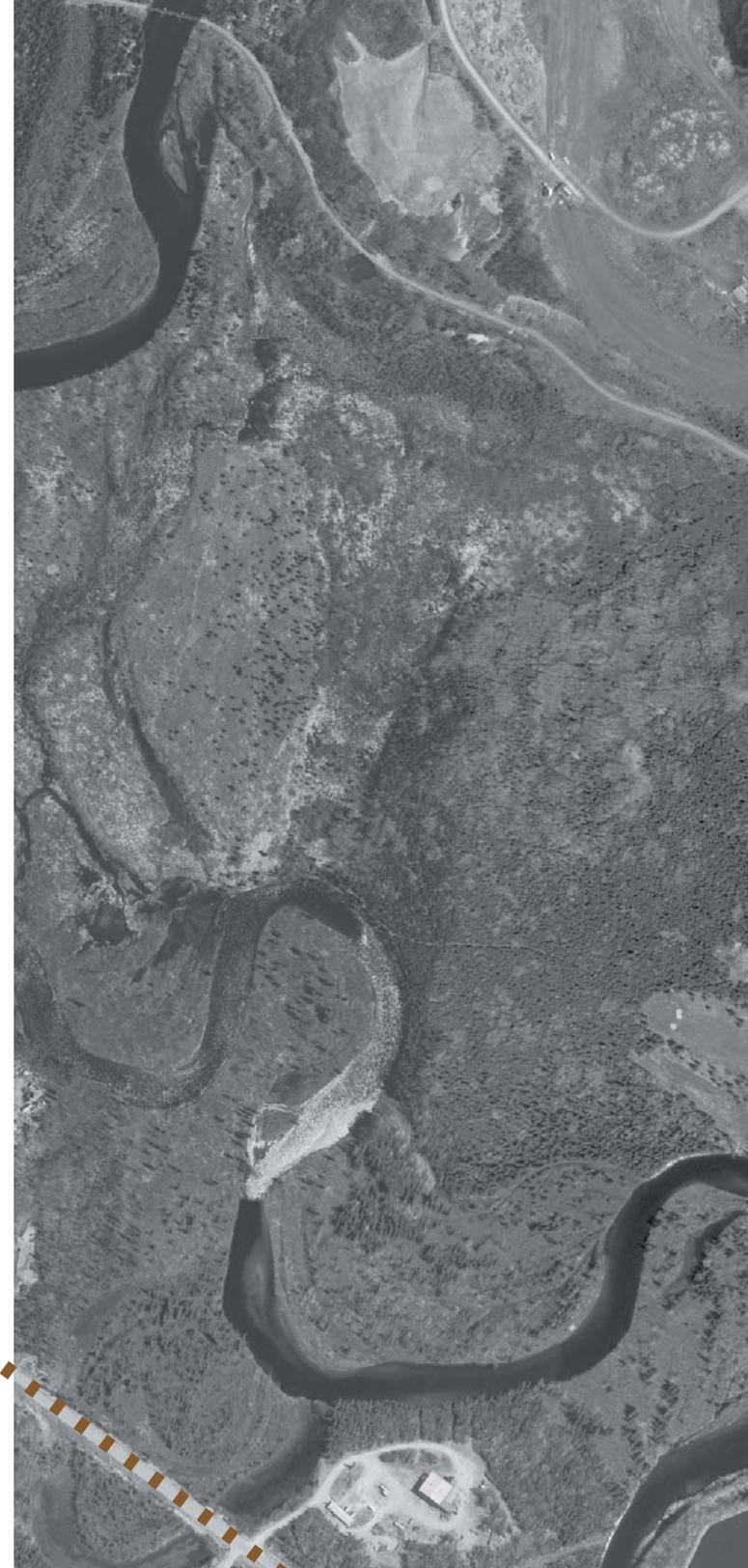






Fig. 2.10 Photo documentation and housing statistics, Wawa. Views located on aerial (Fig. 2.9).

Wawa

DWELLING the numbers 2006

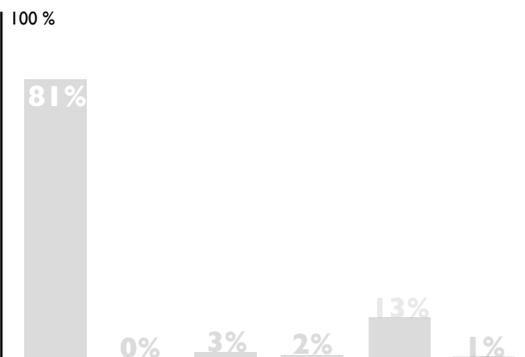
TOTAL PRIVATE DWELLINGS

1,453

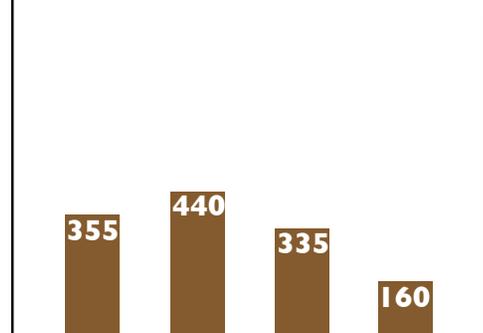
TOTAL OCCUPIED

1,295

DWELLING TYPE:



HOUSEHOLD CONTAINING:



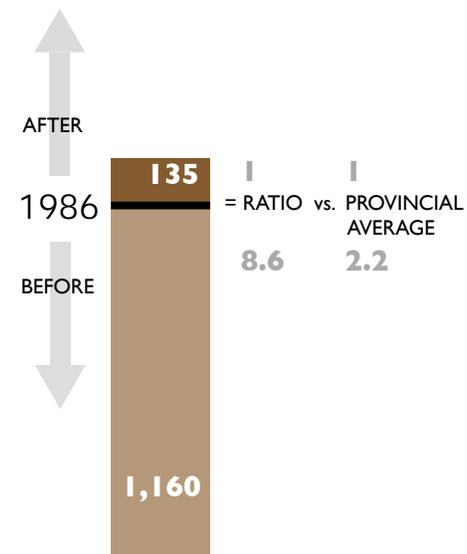
-  SINGLE DETACHED
-  SEMI-DETACHED
-  ROW HOUSES
-  APARTMENTS, DUPLEX
-  APARTMENTS, LESS THAN 5 STOREYS
-  OTHER (re MOBILE)

-  COUPLE WITH CHILDREN
-  COUPLE WITHOUT CHILDREN
-  ONE PERSON
-  OTHER

2

Main commercial street. It serves as the regional commercial center for Dubreuilville and White River.

YEAR OF DWELLING CONSTRUCTION:





3 A view of a residential street. Size of bungalows indicates homes are reasonably sized, and reflect traditional functionality towards harsh climate and basic needs.

Courts outside elementary school.

4



Beach front in August.

5



White River TOWNSHIP

AERIAL 1:10000

Fig. 2.11

LEGEND

RAILROAD LINE (White River is a division point for the Canadian Pacific Railway)



RAIL YARD & STATION



TRANS-CANADA HIGHWAY



FORESTRY OPERATION: Sawmill
STATUS: Operations halted



PHOTO DOCUMENTATION (See Fig. 2.12)

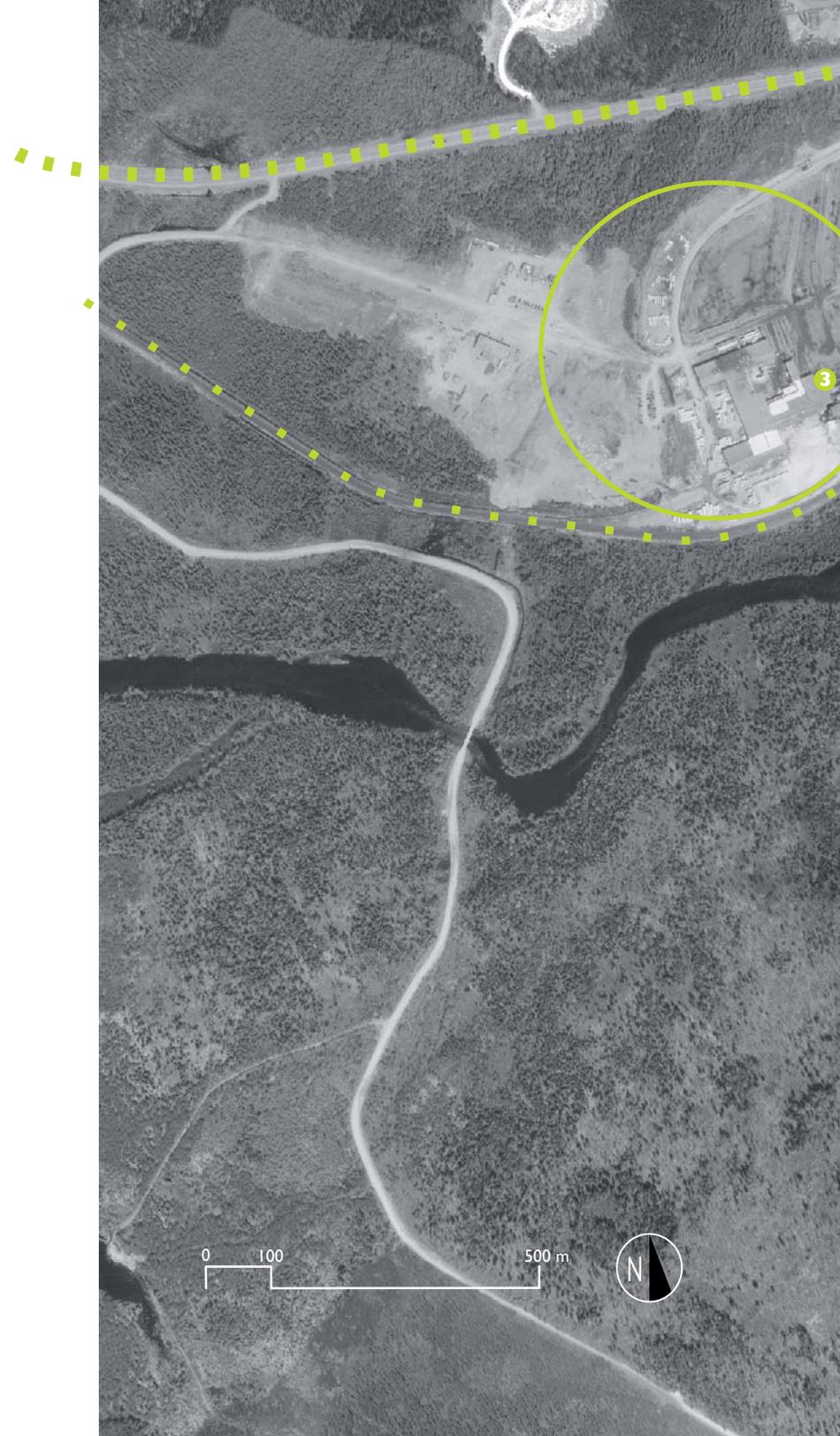






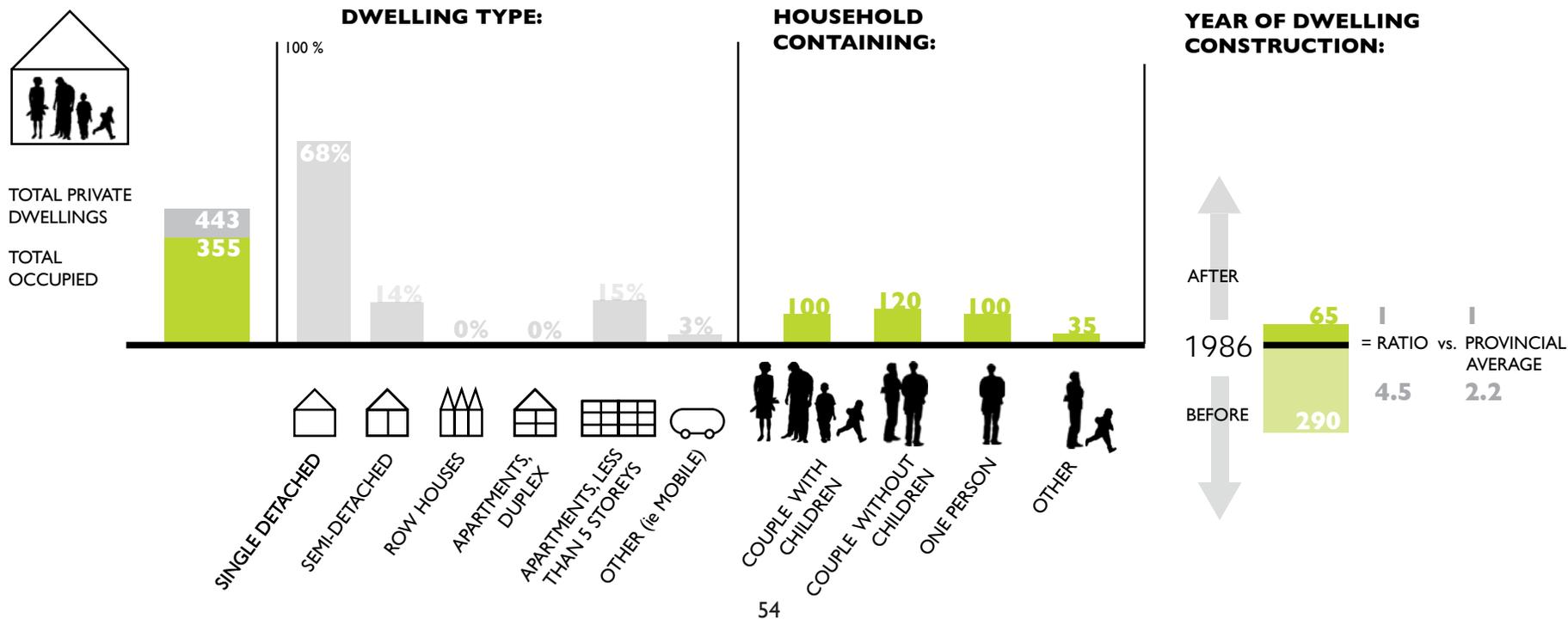
Fig. 2.12 Photo documentation and housing statistics, White River. Views located on aerial (Fig. 2.11).



Grocery co-operative. The building also contains small LCBO and bank; the coupling of services is typical in smaller communities.

White River

DWELLING the numbers 2006





2 Winnie-the-pooh visitor display located on the Trans-Canada highway. The story of the bear is intrinsic source of community identity for White River.

3 A conveyor belt carries wood waste out of the saw mill.



4 View down the traditional main street. On the right, a now closed bar. On the left in the distance is the train station. White River is a division point for the CP railroad.

SUMMARY DISCUSSION:

What do these communities have in common in terms of the built environment? And how do they differ?

These communities share a similar urban form, comprised primarily of single-detached house lots arranged in some form of a street grid. The key community-oriented institutions in small communities are often more identifiable than larger cities because there is just one: one recreation centre/arena, one hospital, one high school, one post office, one library, etc. – all within walking distance. Some forestry communities, however, may not even have certain institutions and must travel to have access to a high school or hospital. For example, residents from White River and Dubreuilville travel to Wawa by bus for high school, although a high school is under construction in Dubreuilville (a primary concern is winter driving safety). This marks one difference between communities: some serve as a center for others. In remote areas, distant from urban centers such as Sudbury, Sault Ste. Marie or Timmins, the population and size of a community is important in attracting amenities and sustaining basic functions. As population declines in a community, businesses may have financial difficulty staying open, leaving vacant and closed-up buildings.

What is the architectural response?

Aforementioned in chapter one, the style and form of the housing largely appears as transplanted and lacks response to the regional environment. The single-detached typology reflects the desires of the residents. However, the typology, in which the building orientation is dictated by the street and not passive solar strategies for example, is not necessarily the most effective in terms of local energy consumption. In light of similar regional conditions, chapter four will compare the architectural response of the NSFC and its existing built fabric, with that of Scandinavian communities.

Key institutions and the remainder of the built environment is primarily functional and for the most part, does not use local materials or generate innovative places that reflect community identity as well as engage residents. In particular, wood is seldom used creatively as primary structure or cladding.

How does this relate to the focus of thesis?

The need for regional response in the built environment and the greater community systems becomes a key focus in this thesis. Specifically, exploring the role of architecture and design towards enhancing the quality of place, through more effective integration between local forest resources, the built environment and community identity.

2.3 REGIONAL REPRESENTATION & COLLABORATION

The formation of Northeast Superior Forestry Community (NSFC) partnership by six communities indicates the isolation towns feel in facing the difficult issues eroding their unique quality of life. The collaboration serves to enhance the quality of life in each town, as well as strengthening the collective spirit, by pulling together the limited resources and talent in the area. At a political level, the Northeast Superior Mayor's Group (NESMG) represents the individual communities. The mayor's of Chapleau, Dubreuilville, Hornepayne, Manitouwadge, Wawa and White River meet monthly, focusing on collective strategies for across-the-board improvements. This regional representation is directed at capacity building to help the **“communities navigate the transformations of the coming decades.”**¹⁴ Particularly important, is the desire of the NSFC to **“participate effectively in forest management.”** They are focused on exploring new and innovative approaches, rather than dwelling on the failing traditional forestry system. Such ambitions build the right kind of momentum: forward thinking and the continual search for higher quality living environments. Coupled with further support and vision from the government and other stakeholders, these communities could increasingly carve out a stronger identity for themselves. This support is important because communities often have limited resources, in terms of both finance and expertise.

As shown by the NSFC, communities are ready for more control of local resources; as well they are looking for more support to develop new initiatives. For the most part, these initiatives are focused on developing new forest-based industries responsive to changing market demands. The NSFC has set the goal to become **“a world leader in economic development based on utilizing forest products more effectively and creating new sustainable employment.”**¹⁵ At this pivotal juncture for forestry communities in Northern Ontario, there is also a promising potential to pursue other fundamental initiatives. These initiatives call for rethinking the

fundamental community systems that affect the built environment, quality of place and long-term sustainability.

Accordingly, it is critical that this potential is explored. The design explorations in the later chapters encourage greater community empowerment by illustrating the potential of forestry communities. Here the potential is not only explored, but also boldly envisioned. This potential reveals the **true value of boreal forest communities and suggests that their undervalued role will be increasingly appreciated in the coming decades of the 21st century.**

03

03 TOWARDS SUSTAINABLE FORESTRY COMMUNITIES

“Having witnessed generations of ruthless resource exploitation, the ‘century of the environment’, which is the predicted focus for the 21st Century will inevitably change design practices.”

- Brian Edwards, *Rough Guide to Sustainability*

3.1 VALUING FORESTRY COMMUNITIES

In Canada forestry communities are traditionally valued for the production of commodities. In addition, communities possess other values that often go unrealized. The long-term survival of declining forestry communities might hinge on their true valuation. Forestry communities deserve to be recognized as a key component to the health of this nation for their role in maintaining the **integrity of the boreal forest**, facilitating future **carbon trading and ecological capital stocks** and most importantly, providing a **unique living environment** that adds a stabilizing diversity across the Canadian landscape.

The integrity of the boreal forest

Although traditionally perceived as harvesters, these communities (as portals for nearby forestry, re-forestation and Ministry of Natural Resources [MNR] operations) are also figurative **caretakers of the forest**. Furthermore, the role of communities as caretakers will be increasingly important if new community forestry models propose to give communities more control of their local resources go ahead. Although any such models are in preliminary planning stages in Ontario, the changing **perception in who should manage and ‘prosper’ from the forest resources opens a speculative and imaginative conversation**. Thus, it is important to value the ‘community’ in forestry communities and envision their potential. New community-oriented models offer the opportunity for more effective localized control and management of forestry land allotments; as well, new models ought to encourage more selective approaches by forest-based industries to maximize the value of extracted resources and ensure continued integrity of the forest stock. In addition, communities as they exist now comprise a decentralized network of boreal forest ‘caretakers’. This network of local skill and knowledge base needs to be maintained. The communities manage the initial stages of the boreal resource flow into broader society – from the energy captured in the forests, to house construction in Southern Ontario. A decrease in the network of capable forestry communities equates to a destabilized resource region

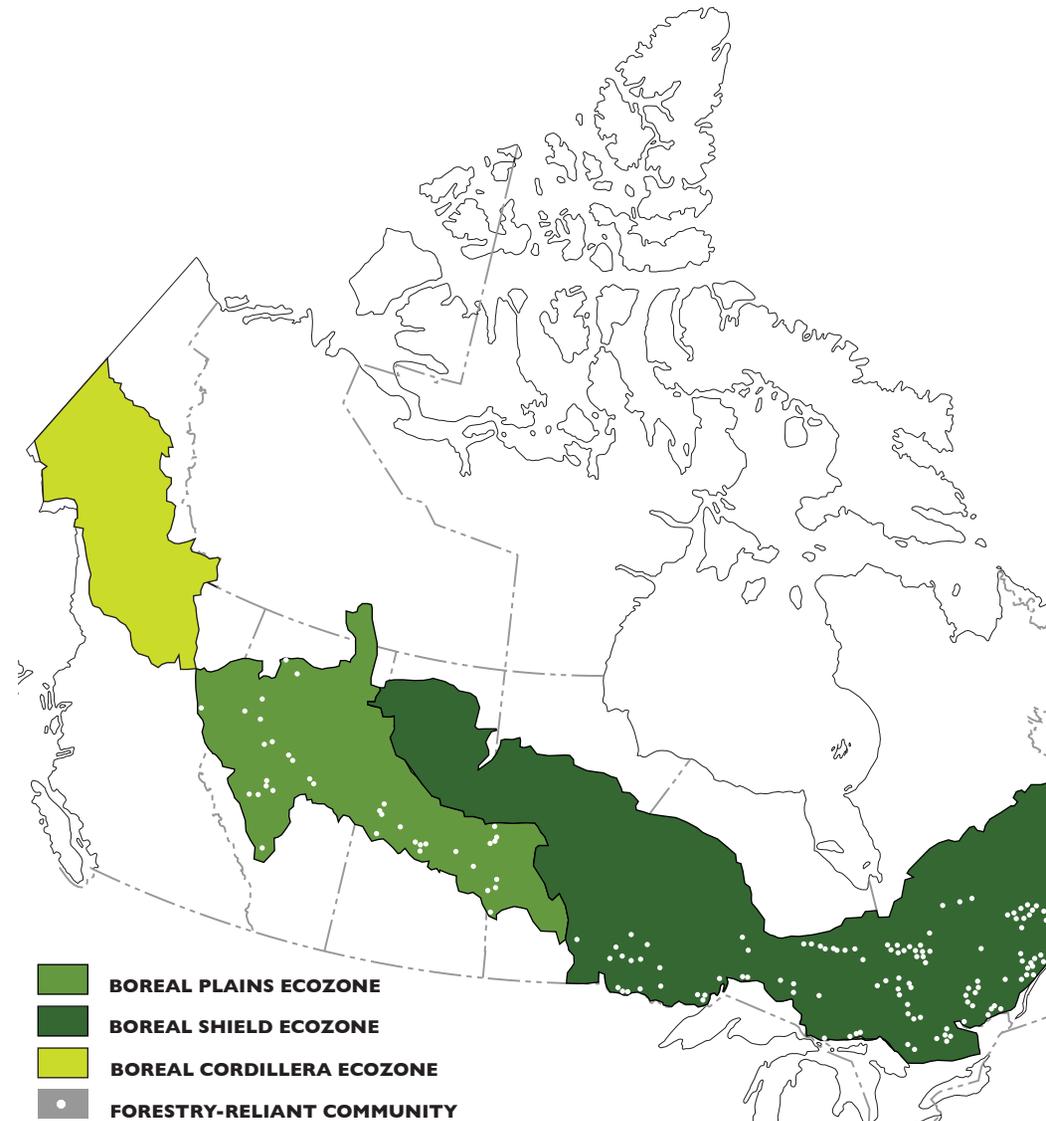


Fig. 3.1 Map of Canada, showing forestry-reliant communities in 2001; one-third of these communities' economy were at least 80% or more reliant on forestry. These figures have likely changed since then because of many industry shutdowns.

“Carbon will be the world’s biggest commodity market, and it could become the world’s biggest market over all.”

- Louis Redshaw, head of environmental markets at Barclays Capital. Quoted in New York Times: July 5th, 2007



supplying the ever-expanding population demands of urban cities in places such as Southern Ontario.

Carbon trading & ecological capital

As new methods of inventorying become part of the global economic marketplace, it is in Canada’s best interest to properly develop an infrastructure that will maximize the value of its ecological capital.

“Underpinning this is the notion of ‘natural capital’ – a kind of global accounting system for all ecological resources. Ecology will be traded: as ecological richness becomes scarce its value will increase, thereby ensuring its survival.”¹

Ecological economics are based on the fact that economic growth cannot continue indefinitely.² The natural resources fundamental to long-term national sustainability are those which can continually renew themselves on solar income: forests and agriculture (over-fishing threatens fishing). Accordingly, it would seem that **the sustainability of rural and remote communities supporting the extraction of these renewable resources would be critical.** Unfortunately, these communities are struggling the most to maintain a quality of life in comparison to larger cities.

This idea of ecological inventorying is beginning to take hold; its earliest recognizable form is through carbon trading, where companies or individuals can pay to offset their carbon emissions. On the other end of the carbon spectrum is the forests: carbon is sequestered in trees. In fully realized global systems of ecological accounting in the future, money would flow from carbon emitters to carbon sequesters. The potential for full cost accounting of ecological capital under new forestry models could serve to strengthen the flow of income back into forestry communities:

“There is potential for reforestation and appropriate harvesting regimes to sequester additional carbon in forests. This could create an additional revenue stream for forestry companies and forest dwellers, thereby providing an incentive to encourage careful management of the forest resource and hence outweighing other incentives which encourage neglect or short-term, destructive exploitation.”³

Or more appropriately, flow suitable retribution to the ‘caretakers’ of the valuable resource. However, this financial resource remains untapped waiting for such a new system of commerce that assigns greater value to ecological resources and the communities responsible for their extraction.

An unique living environment

Forestry communities provide a unique quality of place often undervalued. Its uniqueness is embodied in the form of the community: a small, relatively remote living environment that provides a sense of place of a tightly-knit community, having a close affiliation with its natural surroundings and “if for no other reason than their size, people living in villages and small towns are capable of fostering a sense of intimacy and stewardship for a place.”⁴ Communities such as these provide a valuable alternative to the way of life in southern Ontario where continued growth has led to increasingly similar and impersonal suburban developments. In particular, the looming fuel crisis poses difficulty in maintaining the current suburban lifestyle – a lifestyle structured to be highly dependent on the use of personal vehicles to meet daily functions. Forestry communities offer the value of a tranquil, non-vehicle dependent daily life that is an ideal environment for raising small children. Most importantly, forestry communities serve to diversify the living environments across the vast Canadian landscape. It is through this diversity, that we find both stability to support increasingly populations and identity to bind distant city centers.

Given more control of local resources, forestry communities have the potential to enhance their quality of place. This includes the **potential to demonstrate more holistic ecological integration**. With holistic design, stronger relationships between the natural environment and more diversified economic development is realized, as well as an ecologically sensible built environment rooted in fundamental community self-sufficiency (energy and materials). A stronger relationship between community and natural environment can be approached through restructuring human ecology and organization of urban form and community systems. It serves the community two-fold: a higher quality living environment for residents, as well as an attractive environment





enticing others to in-migrate to the community. Lastly, these communities will increasingly serve as a gateway to ecological experiences (ecotourism, or traditional camping, etc.) as people will travel further and further to find true quality.

There is debate of whether the government should continue to support remote communities if they can not support themselves financially (in terms of tax revenues).⁵ At this pivotal time, developing a more sustainable system is critical for prosperous and ecologically robust communities that will withstand the upcoming challenges of the 21st century. **The question is not whether they should exist at all, but rather, is the country willing to take on this new era of sustainable development with forward and creative thinking?** Is society willing to take short-term risks to realize longer-term visions? These visions are necessary for long-term survival of communities outside of large urban cities. How are we going to intelligently develop unique community environments and protect (in light of future scarcities) the natural resources belonging to us all?

Fig. 3.2 Aerial view of Wawa and Wawa Lake looking southwest toward Lake Superior (seen top right corner). Visible is the natural setting the town is nestled in.

3.2 WHO IS DOING SOMETHING ABOUT IT?

Different stakeholders are launching initiatives that address the issues and crisis surrounding the forestry industry in Northern Ontario. Initiatives are underway by policy analysts, academia, non-government organizations, forestry towns themselves, as well as the provincial and federal governments. Stated below, selected examples of launched initiatives from different groups indicate this changing momentum towards more sustainable practices.

Aforementioned in this thesis, the Northeast Superior Forestry Community (NSFC), a group of six communities, have formed an alliance to gain more political attention, share collective resources and increase their capacity to execute initiatives towards enhancing their respective communities. One success stemming from this collaboration of the NSFC is the funding from the federal government received for their proposal outlining a **transitional strategy** for the communities. Their vision is to “build sustainable forest communities by increasing capacity for maximizing resource potential in order to ensure economic prosperity and stability based on the sustainable use of the broad spectrum of forest values and resources.”⁶ It includes new initiatives such as non-timber forest products (a new and growing market for non-traditional forest resources) as well as educational strategies aimed at developing design skills and a value-added forest economy. Similar movements in the Northwestern part of Ontario have occurred as well. In response to a lack of support from the provincial and federal governments, the group is developing its own solutions.⁷ If the communities are rethinking strategies, the timing seems right for rethinking the ‘big picture’.

Resource Policy Analyst Ben Parfitt directs his writing at the forestry situation in Northern Ontario. He offers some specific advice on improving the current struggles by promoting value-added approaches, greater energy efficiency, as well as more creative wood uses that involve design such as factory-built housing systems, wall units, engineered wood products and trusses. But most importantly, he challenges the provincial government (who are ultimately in



Fig. 3.3 The Superior East Regional Strategic Planning Session in Chapleau, May 22nd-23rd, 2007. The event included representatives from each of townships in the NSFC, First Nations, regional economic development, as well as forestry and environmental planners.

control) to take a more involved role in working with the struggling forestry industry and affected communities. In short, he charges that they are not doing enough:

“... there is very little to suggest that government reforms are designed with the needs and interests of northern resource-dependent communities in mind” and,

*“The province, which benefits enormously from Ontario’s forestry industry, **lacks a vision of what its long-term role** is in helping the industry transition to a new and hopefully more secure future”* and,

*“The Ontario government could go a long way toward putting the industry and resource-dependent communities on a stronger, more stable, more socially and environmentally responsible footing for decades to come... **The time for bold initiatives, not Band-aid solutions, is at hand”**⁸*

This raises an interesting question – what is a bold initiative? And, at such a pivotal time for forestry communities, why are bold initiatives not being proposed? Perhaps too many organizations with too many objectives are hindering the chances for a necessary and bold collective vision. Why not state the following bold proposal:

There will be in-migration to forestry communities in Northern Ontario by 2020. This widespread initiative will focus on creating a highly desirable quality of place, rooted in community self-sufficiency, diverse and stable employment, as well as a unique living environment with low ecological impact.

Given the accomplishments of Canadian society, there really are no limitations on what can be achieved. The primary obstacles preventing ‘bold’ initiatives are a lack of vision and the political will or means to carry out the vision. Accordingly, it is critical that a long-term vision guides and coordinates short-term initiatives so there is meaningful impact and synergy as they are implemented.

3.3 ENVISIONING SUSTAINABILITY: THE ROLE OF ARCHITECTURE AND DESIGN

A range of issues make it difficult for forestry communities in Northern Ontario to sustain their quality of life. Thus, sustainability is the core problem facing forestry communities today. In response to the need for sustainable approaches, this thesis adds to a broader scope of work on forestry by offering an aspect not often touched on – envisioning sustainable forestry communities. Specifically, emphasis is directed at the quality of place in communities and how a community ought to fit into a more holistic vision of sustainable forestry.

Most of the current work on sustaining forestry communities is written, not visual. Thus, the aim of the thesis is to enable others to address the same problem with a different approach – visualization.

The role of either the architect or designer becomes important. Equipped with the vision-making ability, architects must involve themselves in long-term strategizing – a process of reinterpreting daily life with aims for greater community sustainability. Built community environments will change over the coming decades as society increasingly calls for more sustainable approaches. The idea of community sustainability, however, necessitates more than just indefinitely meeting the basic needs of the community.

In the case of forestry communities, sustainability entails people wanting and continuing to inhabit the community. As mentioned earlier, **sustainability in this context can be defined as the continued existence of a community through a self-sufficient, confident, and desirable quality of life.** This objective must be continually sought in the cultural, ecological, economic, political and social aspects of the community. The designer's role is to help others envision and understand this idea of sustainability, as well as illustrate how it can be achieved.

“In this age of complex building projects, convoluted professional interrelationships, rapidly-changing social priorities, climatic uncertainty

*and resource depletion, **architects need to contribute more effectively to the health of communities and to be recognized for doing so.***⁹

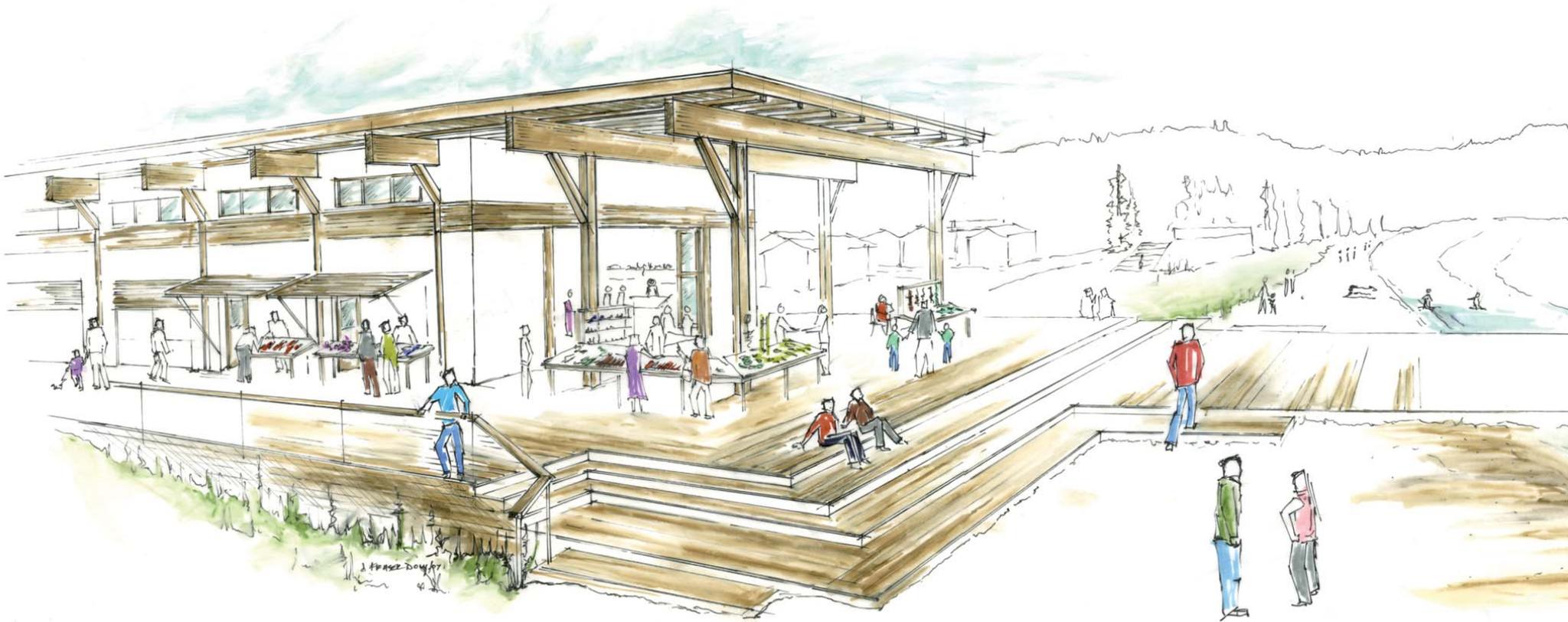
Design is a tool for envisioning sustainability. Designed vignettes have the ability to imagine daily life, craft local identity and visually construct place (See Fig 3.3); diagrams are valuable in showing how optimized resource flows and a shift towards 'ecological economics' ought to enhance a community in terms of resident participation, more stabilized employment, as well as unique living and working environments.

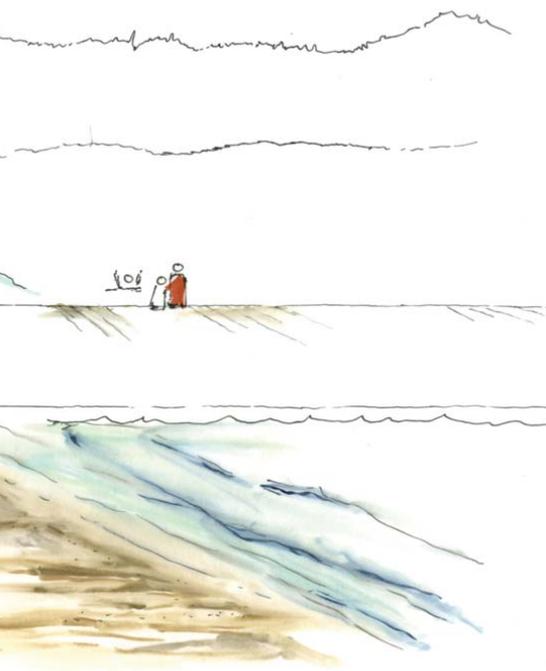
It is also the role of the architect to provide tangible forms of sustainable development for communities to learn from. "If society accepts the idea of sustainable design in buildings, then the sustainable development of cities will follow."¹⁰ Thus, the built environment must address sustainability, as well as ensure that there is a proactive relationship between the built environment and fundamental community systems. In conjunction with this notion, Brian Edwards states that sustainability supports:

- *ethical view of architect's role,*
- *multi-disciplinary approach,*
- *community social and cultural value,*
- *new aesthetic language for architecture and lastly,*
- *ecological thinking*¹¹

Ecological thinking offers insight towards sustainable communities. Kibert et al. assert that "ecosystems are the source of important lessons and models for transitioning human activities onto a sustainable path."¹² Further, if we strive to develop more effective relationships between artificial (community) systems and natural systems, we must learn from and incorporate the efficiency, diversity, resiliency, adaptability, cooperation and beauty ecosystems exhibit.

Fig. 3.4 Designed vignettes enable others to imagine new aspects of daily life. This vignette, alongside others, was shown at the mayors meeting in May 2007 to capture initial interest for the work of this thesis that would follow.





Based on the key issues hindering the sustainability of forestry communities, **architecture and design ought to contribute approaches that stabilize and sustain forestry communities through:**

- Enhancing the **quality of place**, while addressing the issues of temporality, declining property values and lack of amenities – to attract a continuous flow of recruited and skilled professionals that will help strengthen a regional knowledge-based economy.
- Rethinking and proposing unique living and working environments that effectively utilize the local ecological resource base.
- Reflecting a sense of place and the unique regional conditions, while also using local resources to inspire a ‘vernacular’ architecture that replaces the imported technologies, materials and styles.
- Developing more wood-based solutions and innovative approaches to the built environment that use community strengths and contribute to community identity.
- Finding a way to transcend the complexity of the issues surrounding forestry communities by offering a common vision. This requires broad inclusion & execution through systemic design.
- Suggesting appropriate planning principles that reflect objectives responsive to the quality and conditions of place. eg. Envision the community as ‘off-grid’ for electricity and heating, able to plug in and sell its surplus, or purchase when necessary.
- Envisioning sustainability forestry communities and a way of life that is desirable, confident and self-sufficient.

If these towns can no longer sustain their way of life as it developed under the forestry system of 19th and 20th centuries, then it is critical at this transitional time to devote attention towards new, more effective living environments. This thesis seeks to not only retain these communities, **but to envision an enhanced way of life that is on the leading edge of self-sufficiency and sustainability, one which will attract in-migrants to a unique quality of life.** These communities are essential to the functioning of our nation. There is great need to address the future of Canada outside large urban centers. Moreover, there is a need to explore the role of architecture and design in bringing about long-term community sustainability.

04

PART II:

04 DESIGN AND DEVELOPMENT OF A VISION

“The critical issue – for people, organizations, and governments alike – is knowing where we want to be. The imaginary, an alternative cultural vision is vital in shaping expectations and driving transformational change. Shared visions act as forces of innovation, and what designers can do – what we all can do – is imagine some situation or condition that does not yet exist but describe it in sufficient detail so it appears to be a desirable version of the real world.”¹

- John Thackara, *In the Bubble - Designing in a Complex World*

Part I was focused on understanding the past and present in forestry communities whereas Part II, beginning with chapter four, is directed at an outlook on the future and the role architecture and design has in shaping it. At this challenging time in Northern Ontario, shared visions of how sustainable forestry communities could emerge are important. Arriving at such visions, however, necessitates tools to guide and synergize different stakeholders. The tools explored in this Chapter are careful to allow sustainable initiatives to organically grow from the community, and not be predetermined.

The renewable resources of the boreal forest ostensibly provide the means for a forestry community to be self-sufficient in terms of basic needs. With a vision of sustainable forestry communities in mind, this chapter proposes the development of a framework for self-sufficient communities by re-thinking the out-dated relationship between community, forest industry and ecological resource base. The primary directive of this chapter is to shed light on how a local ecological resource base can be more effectively integrated into the built environment, community identity and daily life. **From an architectural perspective, the framework encourages the emergence of design that communicates sustainable building practices, a sense of place, community identity and daily life.**

4.1 OBJECTIVES AND SYSTEMIC DESIGN

Objectives and systemic design serve to support the mindsets of community members so they can better understand how to achieve the key aspects of a more sustainable relationship between community and forest resources.

In approaching a vision of sustainability, it is useful to have objectives that inform decision-making of different disciplines at all levels. Objectives deal with complexity by guiding a diverse group of stakeholders onto the same page: provincial and federal governments, non-government organizations, community residents and recruited expertise. Objectives also bridge generational gaps and different mindsets. The thought process can be dissected into the simplest of terms. If the question/design does not satisfy the objective criteria, then it must be re-evaluated. It is an effective tool in helping people easily adapt to a sustainable mindset. In the past decade, the use of such objectives has come across as an effective means of achieving more ecologically sound solutions. In particular, three proponents for sustainability stand out as using objective-based approaches to launch their viewpoints:

Sustainable Community Development

Some selected principles as a basis for sustainable community development.

- *Reinvest in living systems even as we reinvest in business;*
- *Only a unified systemic world view is a sustainable world view;*
- *Specify what is to be sustained;*
- *Sustainability is a continual process, not a fixed end point*
- *Understanding, accepting and being accountable for intergenerational equity.*⁴

The Netzstadt approach

These five objectives are intended to gauge urban quality and guide decision-making in reconstructing cities:

Identity
Diversity
Adaptability
Self-sufficiency
Resource efficiency³

The Natural Step

Sustainability objectives that lead an across the board approach.

- 1) *Reduce wasteful dependence upon fossil fuels, underground metals and minerals.*
- 2) *Reduce wasteful dependence upon chemicals and unnatural substances.*
- 3) *Reduce encroachment upon nature.*
- 4) *Meet human needs fairly and efficiently.*⁵

“A sustainable community is one that looks beyond narrow, conventional solutions to social and environmental problems and addresses them instead from a broad, holistic viewpoint.”²

-Timothy Beatley and Kristy Manning,
The Ecology of Place

Self-sufficient: the ability of a community to meet its needs through sustainable use of its local resource-base.

Confident: the ability of a community to approach the future with a positive and sure mindset. This approach is shared by residents, municipalities, industry, provincial and federal governments.

Desirable: a high quality of place and life retains residents while also attracting in-migrants and visitors.

These three approaches use objectives that reflect what is hoped to be achieved. The different objectives all have the potential to empower community members with a sustainable mindset. However, with respect to forestry communities in Northern Ontario and the need to ‘restructure’ towards long-term sustainability, the ideas behind the Netzstadt approach are best suited to this thesis. The simplicity of the one-word objectives is effective as a remembering tool, a guide for diverse community groups, as well as a marker for attracting distant individuals. With this approach in mind, it is important to find the right principles that work for the community condition and engage the public. In addition to the five Netzstadt objectives, this thesis considers the unique case of forestry communities and suggests an example of a more specific objective for sustainability: the continued existence of a community through a **self-sufficient, confident and desirable quality of life**. Accordingly, the design exploration to follow in this thesis will focus on this objective.

Systemic design

Guiding objectives encourage a systemic approach, where all aspects of the community – cultural, ecological, economic, political and social – regardless of discipline, work together towards the greater goal of sustainability. A ‘system’ implies a group of interrelated parts functioning together. Chris Maser in *Sustainable Community Development, Principles and Concepts* explains systemic design as envisioning all aspects of the community as an interrelated, dynamic system, that is defined by the functioning of its parts.⁶ In trying to achieve greater integration between the ‘parts’ that are the community, forestry and natural systems, **design must envision where interventions are possible and how such interventions will contribute to greater ecological cohesion between the ‘parts’**. As these three systems are ‘parts’ of a common greater ecosystem – where the integrity of whole is more critical than the parts – there is opportunity for more effective energy flow between them. This relationship can be achieved by visualizing remote forestry communities in Northern Ontario as more emulative of natural systems. Holistic integration and better resource flow between a system’s ‘parts’ serves to enhance the self-sufficiency and quality of the community.

4.2 RETHINKING THE COMMUNITY/ FORESTRY SYSTEM

In working towards a vision that encourages a more effective, sustainable living environment, it is first necessary to understand what defines the existing quality of place in a given community. Gaining this understanding allows one to ‘rethink’ the fundamental system that affects place, and then envision the key aspects and desirable qualities of a new system.

In forestry communities, the underlying system defining the **quality of place** (and living environment) is the relationship between community, forestry operation and ecological resource base. This relationship can be described as the community/forestry system. Aforementioned in Chapter I, the foundation of the community/forestry system is the process of converting ecological inputs to economic outputs.⁷ In addition, many communities are supported by other industries: CP or CN railroad operations or Ministry of Natural Resource operations are such examples.

In Northern Ontario, the community is a separate entity from the nearby forestry operation(s). However, it is largely dependent on the operation as its primary source of well-paying employment. The forestry operation is governed by the provincial tenure system that allocates crown-owned land and assigns the details of how forestry should be carried out. Hence, any significant changes to the quality of place ultimately rely on changes to the current tenure system. The tenure system must deal with an increasingly complex number of interest groups with a stake in the land: forestry industry, tourism and recreation, First Nation claims, mining, trapping, potential carbon trading, etc. As a result, community development is restrained by the forestry tenure system.

Historically, the northern peripheral regions were “incorporated into the broader Canadian economy and society in such a way that the primary benefits from the development of regional resources have flowed out of the region and into southern hands.”⁸ While some current forestry operations value

“Communities can and should derive maximum benefits from that thriving [forest] resource. And the challenge – a realistic and achievable one it must be emphasized – is to ensure that ways are found to get the best use out of that publicly-owned resource so that everyone benefits to the fullest extent possible.”

-Ben Parfitt, *Public Forests, Public Returns*

the nearby communities, the flow of economic output still functions on this older principle. This section focuses on putting community (and its quality of place) first by identifying desirable qualities and principles in an idealized community/forestry system. It encourages a redrafting of the current tenure system to realize greater potential for sustainable forestry communities.

Changing perspective

The fundamental relationship between the forestry industry and communities is at a pivotal moment. Under the current forest tenure system, it is inevitable that the closure and consolidation of mills, as well as the declining employment currently impacting forestry communities, will continue.⁹ With the forestry industry in Northern Ontario in a crisis, **people are searching for new ‘models’ in forest resource utilization.**

New models in forest rights and management, different from the traditional community/forestry system in Ontario, are the topic of much speculation. Excerpts from two different Northern Ontario Business Magazine articles indicate current speculation on the most effective future path for forestry:

“The Ministry of Natural Resources (MNR) is currently working to revamp how it allocates Crown land, a process which may end up including communities as a partner in the new model”¹⁰ as well as,

“... under the current system, it’s increasingly difficult for small value-added enterprises to spring up, he says. As a result, the current tenure system needs to be adjusted to include communities as a stakeholder or primary voice in the allocation process ... The thrust of these ideas is largely centred around establishing boards or committees made up of community representatives, who would play an equal part in the process of deciding forest allocation.”¹¹

Evidently, it seems there is need for rethinking the fundamental structure of forestry. Changes to the provincial forest tenure system will have long-term implications on the communities of Northern Ontario. Thus, it is important to **highlight attributes and approaches to life and development that support community sustainability.**

Envisioning a new community/forestry system

What are the desirable qualities to strive for in communities? What changes in the fundamental system framework will make these qualities achievable? How might daily life be different in these communities within a new forestry system? What could life be like in 50 years?

These questions push for a vision of a new community/forestry system that is far-sighted and community integrated. Changes towards strengthened living environments in remote communities and design response begin at the resource level. Fundamentally, the path towards sustainable communities relies on the baseline economy generated through forestry.¹² Thus, there is need for a new sustainable and prosperous community/forestry system that will allow resources to develop into a sustainable regional economy that enhances daily life and the quality of place.

The diagram on the following spread (Fig. 4.2) is intended to demonstrate the value and opportunity of rethinking the community/forestry system for long-term sustainability. It is important to note that the principles, from a fundamental forest resource level to the built environment, are **directed at enhancing the quality of place in forestry communities**. In forming these principles, Daly and Farley in *Ecological Economics* offer insight into the sustainable use of ecological resources. The work of Beatley and Manning in *The Ecology of Place* delivered a case for planning within ecological limits (available resources), a sense of place, as well as cultural and historical context. Lastly, the need for capacity-building in forestry communities through education and innovation with respect to local resources, emerged from the *NSFC Strategic Plan 2007-2011*.

“So systems are important. The trouble is because it’s seldom obvious who should look after them, nobody does.”

- John Thackara, *In the Bubble - Designing in a Complex World*

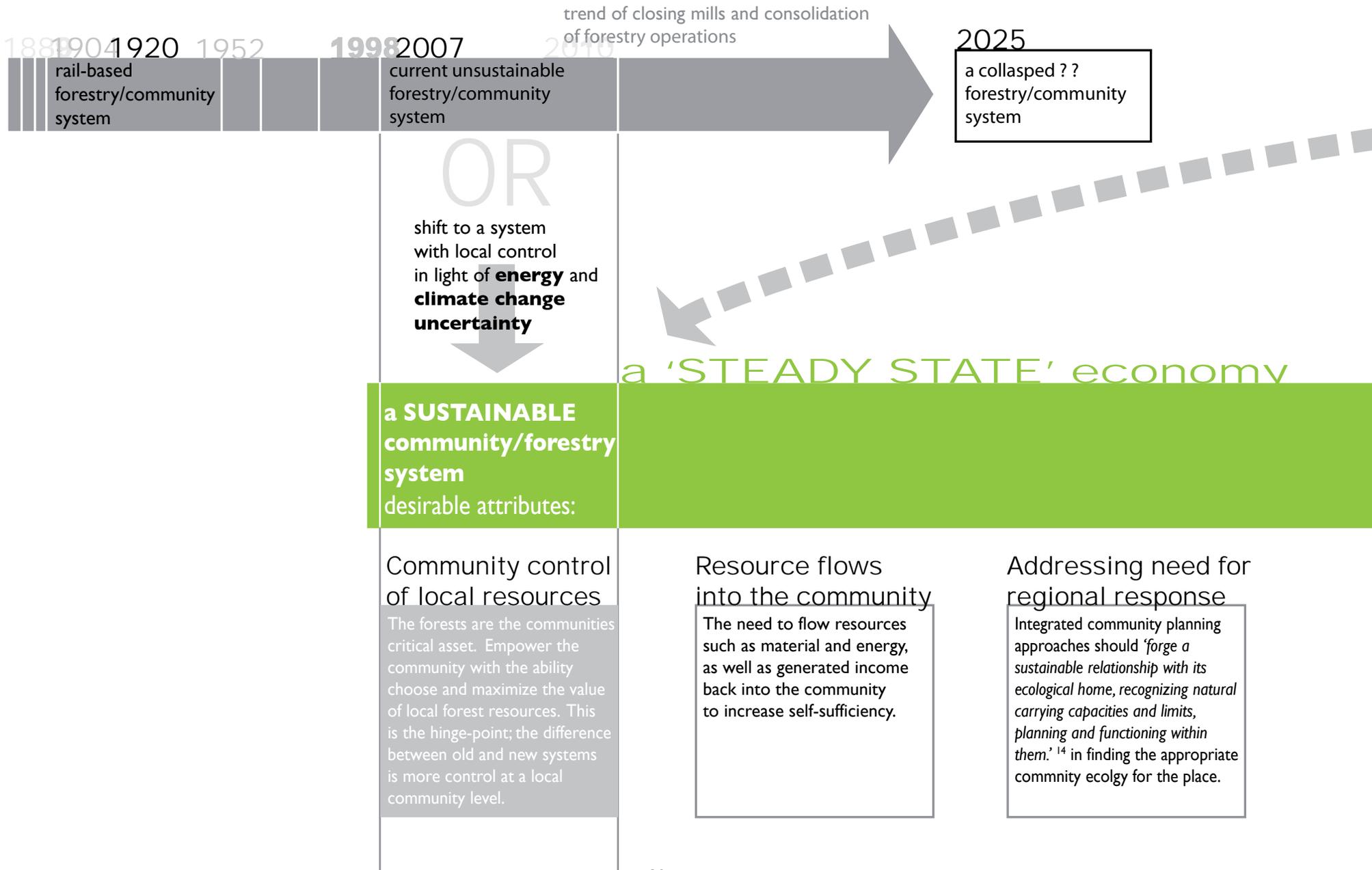


Fig. 4.1 View of mill yard in Chapleau with the stack of the Cogeneration plant in the background.

Imagining how a new community/forestry system might operate and interact takes shape in a framework to guide sustainable development (See Section 4.4). Before getting to this framework however, it is important to understand how a more flexible community/forestry system offers the opportunity for better resource flow. More specifically, how resource flow influences the built environment and daily life, as well as how architecture and design can better respond to the sense of place and the potential for more effective resource integration.

Fig. 4.2

Re-Envisioning the System *principles towards enhancing Northern Ontario and its forestry communities*



Sustainability is a Continuous Process:
Continuously EVALUATE, RE-ENVISION, ADAPT, ENHANCE

A steady-state economy relies on an optimum throughput (removal of wood resources) that can be maintained and replenished by the ecosystem through its solar income.¹³

Establish the right balance between quality and quantity. The industrial systems of the past have been about quantity; a new era of sustainable development calls for an ecological economics focused on quality and ecological integrity.

community
participatory
process

Contributing directly
to built environment

Local wood resources become an integral part of architecture and built environment. Develop a regionally responsive architecture through local materials that strengthens culture and identity.

Enhancing the
quality of place

Creating an attractive living environment through sense of place, a desirable built environment and a prosperous community.

Innovation and design

The local forests must provide a readily available source for new wood-based initiatives. This serves to encourage innovation, allow for risk-taking and diversify the local economy. As well, developing capacity-building strategies (especially with youth) for a design and knowledge-based economy.

a **SUSTAINABLE**
community/forestry
system

The development of vibrant living environments that are ecologically responsive to place and ensure long-term existence through a self-sufficient, confident and desirable quality of life.

4.3 INVENTORY, INTEGRATION AND RESOURCE FLOW

Human ecology is another way of thinking of a community or town. It is the way whereby urban form and community systems function (physical, cultural and social) with respect to their ecological resource base and the biosphere.¹⁵ The built environment embodies human ecology; it is the interface between the community systems (infrastructure), the living and working environments of an individual's daily life as well as community identity. For a community to be sustainable, its human ecology must be self-sufficient and sustainable. This includes the built environment too.

A new community/forestry system offers the opportunity to rethink the utilization of a local ecological resource base. In working towards achieving sustainability at the scale of the individual, building, community and region, it is key to optimize the ecological resource base. This can be addressed through three processes: inventory, integration and resource flow.

- **Inventory** describes taking stock of community functions at each scale. An example is the food and energy consumption of an individual; where do those supplies come from; what is the quantity and type of energy consumed annually by the community centre as well as the materials used in its construction; what is the available local forest resources and its potential values (based on different uses). In attempting to improve community self-sufficiency, it is essential to gauge what could be replaced by more effective integration with the local ecological resource base.
- **Integration** is the process of aligning community systems with natural systems. It seeks the most effective relationship with the local ecological resource in terms of self-sufficiency of basic needs (shelter, energy, food), a prosperous local economy and a desirable quality of place.
- **Resource flow** is a dynamic process that visualizes the exchange of resources in a community and the process of conversion from ecological capital to economic gain. In working towards sustainability, a community must maximize the value of local resources and visualize the most effective human ecology.

“How might knowledge of ecological processes help us better harmonize the life cycles of buildings with the dynamic ways in which the environment builds and recycles structures?”¹⁶

- Jan Sendzimir, *Construction Ecology, Nature as the basis for green buildings*

Understanding Resource Flows

In addition to the experience gained with respect to the Scandinavian models, the extensive diagrams from *Netzstadt: Designing the Urban* were an insightful tool towards understanding individual, community and regional resource flows. Their focus on re-thinking self-sufficiency was also influential towards envisioning sustainable forestry communities. The written works of *Sustainability, a systems approach* as well as *In the Bubble, Designing in a Complex World* both contributed additional perspectives with respect to analytic and intuitive understanding of resource flow.

Learning from Scandinavian Models

The focus of Sarah James and Torbjorn Lahti on Scandinavian models in *The Natural Step for Communities* offers an understanding of the community involvement process towards sustainability, as well as ecological resource flow and integration with the built environment. This particular work inspired the author to visit northern Sweden to gain a greater understanding of how rural and remote forestry and communities operate in similar climatic and geographic conditions to those in Northern Ontario. The visit included discussions with individuals whose expertise included town planning, forest resource management, private forest liaison, as well as regional development. Supported by discussions with individuals in Ontario involved with cogeneration and other biomass energy plants, various aspects of the forestry industry, as well as construction and real estate, these experiences formed the foundation for the schematic analysis in this thesis.

Rethinking forest resource flow into built environment

In Scandinavian countries such as Sweden and Finland, the built environment reflects effective inventory, integration and resource flow from the regional scale to that of the individual. Sparked by the shortages of the 1970's, their current systems developed from the necessity to find alternatives that decreased dependence on foreign oil, such as 'municipal solid waste, waste heat recovery and renewable resources.'¹⁷

Fig. 4.3 Sawmill waste is sometimes trucked to pulp and paper facilities or used for energy and power generation, but too often it sits useless in a massive pile beside the mill.



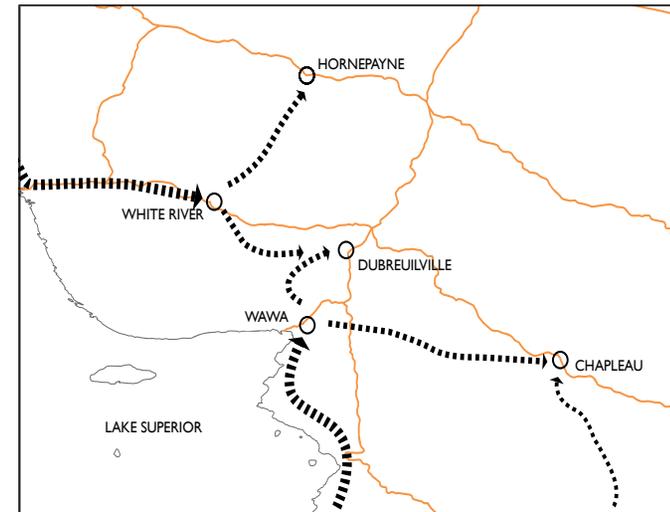
Learning from Scandinavian Models

XL REGIONAL SCALE

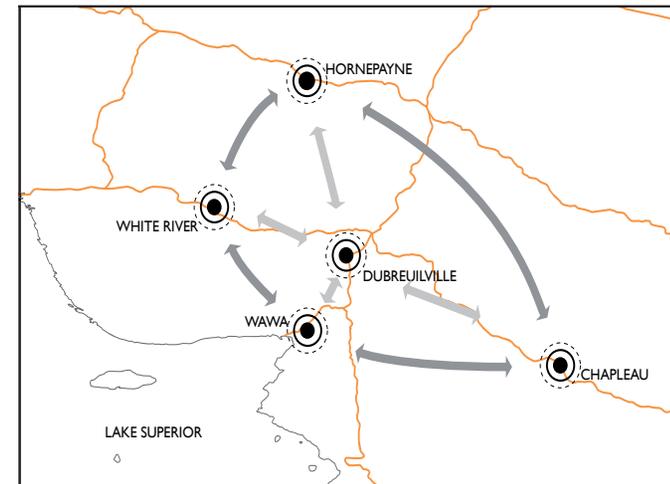
In Scandinavian models, the forestry system acts as an open market at the regional scale; the transfer of all forest resources encourages ecological product development, local renewable energy supplies and ecological building.¹⁸ All parts of a felled tree are utilized, and silviculture (maintaining forest integrity to increase productivity) is as integral to the process as the actual 'cut'. In most municipalities, wood waste must be used for energy production.¹⁹ This knowledge is not new to forestry operations in Northern Ontario, even though many have vast wood-waste piles adjacent to their mills. Complexities in the outdated forestry and energy systems in the province of Ontario have led to this outcome. The provincial system is not currently geared towards creating energy self-sufficient communities in Northern Ontario.

While there is energy integration between forestry operations in Northern Ontario, there is little integration between forestry and community in terms of resource flow. As some forestry operations close, they no longer need the waste from other forest industries. The waste (someone else's resource) becomes a cost to the operation and often remains unused.²⁰ There is valuable potential to integrate community systems with natural systems simultaneously at the regional, community and building scale through effective use of the ecological resource base. And in so doing, enhance the quality of life in remote forestry communities.

Fig. 4.4 Schematic diagram illustrating greater self-sufficiency and exchange at a regional scale in terms of energy and material. Rail network included because of long-term prospect for low-ecological impact transportation.

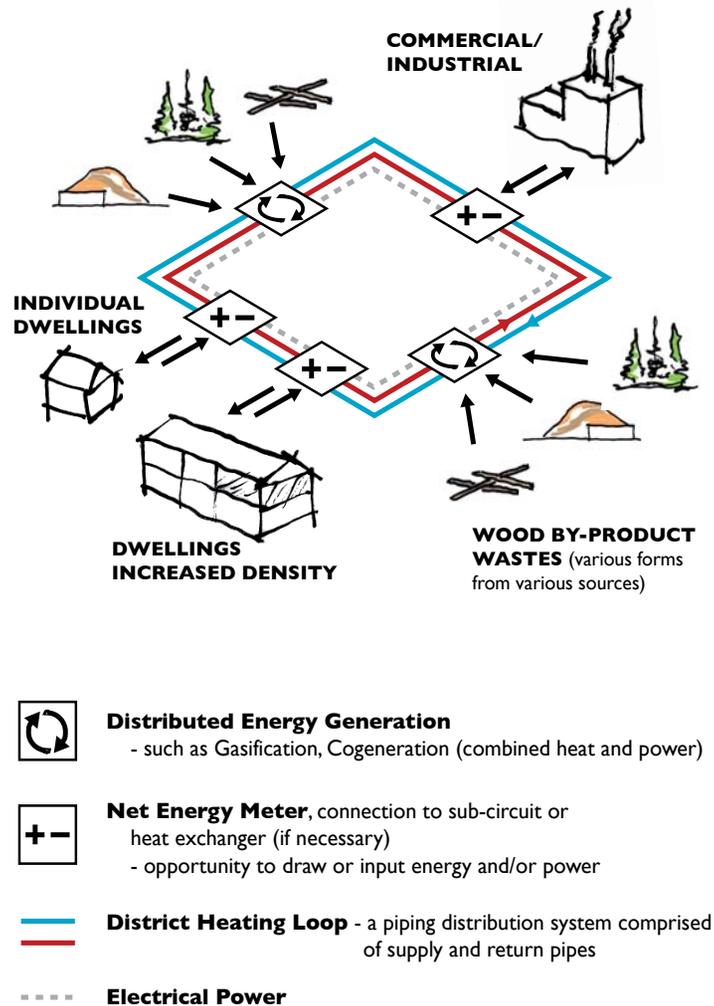


Current reliance on imports.



Envision: a network of self-sufficient communities.

Fig. 4.5 Schematic diagram illustrating typical energy systems of a Scanadinavian community.



COMMUNITY SCALE

At the community scale, Scandinavian municipalities are responsible for energy distribution. Their municipal model exemplifies the concept of inventory, integration and resource flow. The municipalities operate a self-sufficient energy system that relies on integration with local resources. Forest 'waste' resources (in various forms) flow into a community grid in a decentralized fashion, with power generated through distributed biomass converters, outputting either electricity or district heat. (See Fig. 4.5) The infrastructure is fitted with a two-way meter, **thus encouraging innovative building approaches that are sensible and profitable.**

In Northern Ontario, a new community/forestry system encouraging self-sufficiency would require a shift from current infrastructures. The initial expense of such infrastructural changes would most likely be disdained given the likely income from most municipalities.²¹ Unless, it can be shown that the potential built environment, quality of place and the long-term community sustainability achievable through new infrastructures far outweighs the initial cost. Thus, critical decision-making requires the support of long-term envisioning. **At the heart of these visions, architecture and the built environment becomes a field of exploration from which new ideas in exploring future living environments can emerge.**

M BUILDING SCALE

The three resource processes also encourage rethinking building construction in terms of sustainability. In Scandinavia, architecture is integrated into the local ecological resource base, both in terms of energy and materials. Where building typologies allow, structure and cladding are largely wood-based. In addition, density is often increased, in combination with smaller living units, to maximize the district heating with respect to individual heating load demands. The natural aesthetic of wood, often combined with traditional rot-restraint bright paints (traditionally derived from a smelting waste by-product), offers a local appearance. The result? A built environment that is regionally responsive, self-sufficient and embodies cultural identity.

In addition to the Scandinavian building methods, Kibert et. al offer some guidance to sustaining the built environment through construction ecology and construction metabolism:

- **Construction ecology** should consider the development and maintenance of a built environment (1) with a materials system that functions in a closed loop and is integrated with eco-industrial and natural systems; (2) that depends solely on renewable energy sources; and (3) that fosters preservation of natural system functions.
- **Construction metabolism** is resource utilization in the built environment that mimics natural system metabolism by recycling materials resources and by employing renewable energy systems.²²

In sustaining forestry communities, new approaches to building must be integrated with improvements to the underlying community systems, as well as communicate these ideas to residents.

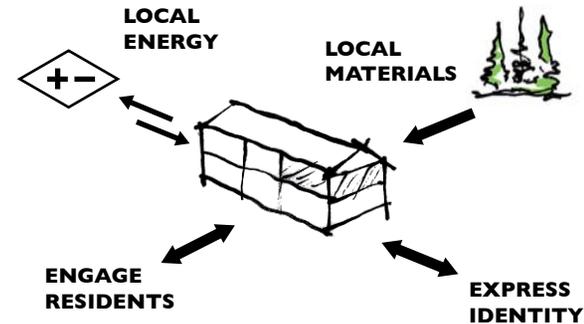


Fig. 4.6 Schematic relationships desirable in built environment.

Fig. 4.7 Townhouses in Storuman, Sweden. The red paint is noticeable as a regional aesthetic; traditionally the red colour emerged from an iron oxide paint mixture, which was used to protect the exterior wood cladding. The iron oxide was a waste by-product of iron ore smelting plants.



S THE INDIVIDUAL

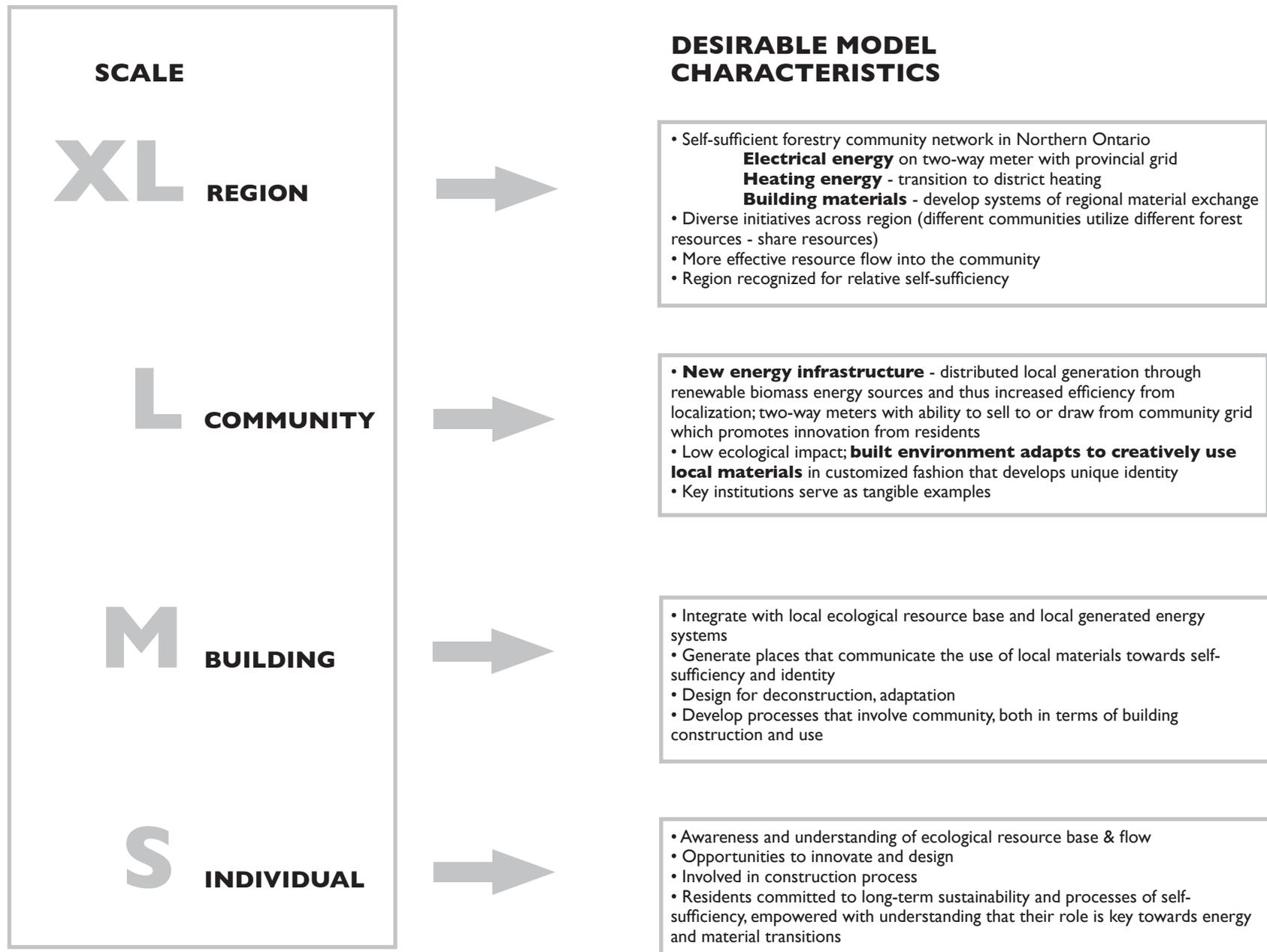
It is important to captivate individuals on the processes of self-sufficiency and empower them with opportunities to 'grow' their own solutions.

With wood construction, the maintenance of a building/dwelling becomes an expression of place and ownership, while the material itself is a visible exhibition of ecological cycles. Educating residents about rethinking resource flow into the built environment is key. Then, when new building opportunities or renovations arise, the resident is conscious of the larger picture. **Most importantly however, is the need for tangible examples that promote and communicate ideas about self-sufficiency – buildings that are regularly used by the community.**

Fig. 4.8 Portable saw indicates local skill and knowledge base in NSFC, as well as the potential for customizable design and greater identity in the built environment. Photograph taken in Dubreuilville.



Fig. 4.9 Rethinking forest resource flow into built environment



CURRENT PRACTICES & LIMITATIONS

XL

- Bioenergy now constitutes more than 55% of the total energy used by the forestry industry.²³

Limitations

- Forestry mills shutdown, forest resource allocations are often redirected away from local use: **'their are many operations not directly in within our region that pulls lumber from our forestry operations'**
- Non-local ownership (tenure) of ecological resource base and current energy distribution system



RESOURCE FLOW ENERGY-BASED & MATERIAL-BASED TRANSITIONAL STRATEGIES

- A vision for a network of energy self-sufficient communities as well as steps and policies that support the transition
- Widespread inclusion in the vision from communities, industry, First Nations and all levels of government

L

- If energy created at mills; it is directed to mills or sold back to grid. Not sold directly to community (would be cost-effective + more efficient)

Limitations

- Some communities have tried for District heating from Biomass but...
 - 1) Distribution of housing (low-density) = more \$ for District Heating
 - 2) Low potential customer base. Need larger buildings in community willing /able to use hot water for primary heat energy source.
- Built environment is largely transplanted technologies, style and materials



- Widespread inclusion in the vision
- Provide tangible, built examples that demonstrate interaction, engage the community in sustainable building processes.
- Community goal setting for energy and material transitions
- **Key community institutions must provide leadership by making transitions to this new system of local materials and energy production**

M

Dwelling Energy: The primary sources of heating is forced air wood/oil combination furnace.

Materials: For framing, may use local lumber supplied by building depot. Older cladding, high ecological impact, but durable

Limitations

- No reliable/communal system for wood cladding upkeep.
- Need systems that flow local ecological resources into built environment



- Innovative use of local energy and locally customized building components (value added)
- Expose process, reveal wood structure where possible and key energy flow characteristics (ie glazed viewing wall showing wood-pellet fired heating system)

S

- Existing practices / habits

Limitations

- Instability of job market - unwillingness to invest in energy/local material upgrades to their housing
- Lack of assistance to make transitions



- Involve residents in construction retrofits and new infrastructure
- Provide activities for that engage individuals from youth to older generations
- Provide incentives for action
- Provide portal (ie community website) for self-education

4.4 DESIGNING A FRAMEWORK FOR SELF-SUFFICIENCY: A TOOL FOR ENVISIONING

Examining the fundamental characteristics and vernacular architecture of communities, villages and towns worldwide traditionally responsive to place, Athena and Bill Steen note that in the developed world, technology has “armed [society] with illusory self-sufficiency, it is now possible to ignore the constraints of the local environment and build whatever, wherever, and however we please.”²⁴ In light of this need for more appropriate responses to the built environment, this section investigates reconciling technology with local resource flows towards community self-sufficiency. Specifically, it schematically maps forest resource flows: both the existing community/forestry model and a re-structured model or ‘framework’. The design of a framework towards self-sufficient forestry communities synthesizes previous sections: objectives for sustainability and the notion of a new community/forestry system as means for more effective resource integration. More importantly, the framework helps others share a collective vision of what life could be like in the future. It takes integrated building design one-step further to integrated community design; it is a platform designed to bring a range of multidisciplinary individuals together to collaborate on sustainable initiatives.

Why is the development of a framework important?

- Like sustainability, the framework is flexible and an ongoing process – not fixed. **The framework is intended to generate speculative discussion and designs addressing the sustainability of remote forestry communities in Northern Ontario.**
- Communities face a transitional time as mills shut down their operations permanently. The framework envisions how communities can use local forest resources to become fundamentally self-sufficient, create a more prosperous and diverse local economy and enhance the living environments of their own daily lives.
- Through restructuring community systems, the designed framework explores the potential of sustaining remote forestry communities. It offers a convincing path whereby specific goals can be set.

“Elaborate the vision – paint the whole picture. Frame goals inclusively, mount a campaign across a broad front. Look for overlaps, connections, synergies: ways in which our goals are mutually implicated and mutually reinforcing.”²⁵

- Anthony Weston, *How to re-imagine the world*

- The framework transcends different agendas and mindsets. Such visions are necessary guides for the transition of formal frameworks such as policies and plans towards more responsive to sustainable communities.²⁶
- It illustrates the relationship of the built environment to local natural resources and daily life. And how this relationship can be more effectively integrated to the local ecological resource base.
- It visualizes the difference between current and proposed community self-sufficiency. The framework illustrates what communities currently have and could have.

Community involvement, integral to the development process

The framework is intended to guide the self-organization of the community, allowing for future diversification and enhancements by the community themselves; it is careful NOT to predetermine what the exact community response should be. A diverse range of key individuals in the NSFC were consulted for their perspective on a preliminary framework for self-sufficiency, as well as the potential for implementing such framework. If a 'framework' is to be realized, widespread involvement from the residents is necessary. In support of this, Torbjorn Lahti, a leader in sustainable community design writes that community involvement in the process is integral.²⁷ Alongside local and recruited expertise, as well as local skill and knowledge development, it is role of the community to develop, expand and 'fill-in' the framework. Thus, the community itself generates a greater sense of ownership and identity as the framework is implemented.

To achieve community and resident engagement (rather than separation) the framework must invite participation.²⁸ In developing a framework, the process is best introduced as a community initiative, such as the NSFC. Lahti also states, "It is easier to embrace a new way of thinking when there is compelling reason to do so."²⁹ For many forestry community residents, sustaining the quality of life in their own community is compelling enough. As mills close, many residents are looking for alternate employment opportunities. Accordingly, the situation necessitates rethinking the fundamental systems that generate employment. The framework is an achievable guide for greater self-sufficiency, and with more sustainable initiatives, more stable employment should follow. The nested integration of the different community aspects – economy and employment, built environment and quality of place – with local forest resources is intended to encourage the development of truly sustainable communities. **In the end, long-term approaches to sustainability must empower the community with the ability to decide its own future.**

Fig. 4.10 (Right-page)

Existing Model - Built environment and daily life

The current community model represents a typical forestry community, based on the author's experience with the NSFC. It is important to note this typical model is intended to encourage discussion about resource flows from the boreal forest. Not every community operates in this exact manner.

It should be pointed out that the MNR sells permits for a nominal fee that allow Canadian citizens to cut down trees on pre-marked sites for energy supply and home construction. While, many dwellings support their heating loads in the winter months with a wood stock they have cut themselves (See Fig. 4.9); home building from a local supply is less evident. Self-stoked heating typically occurs through a wood/oil combination forced-air furnace. A small percentage still solely relies on a wood fireplace. Thus, for a fraction of their daily needs, some individuals survive on local biomass (the forests). For the larger percentage of community activities, distant technology has allowed shelter, energy, and food to be transplanted, and hence, created an 'illusion of self-sufficiency'.

The current model of forestry communities reveals promising potential for increased self-sufficiency.

Existing Model - Traditional economy

The existing model indicates the typical relationship between forestry operation, community and local renewable resource-base. Notice the narrow economic output of traditional commodities, such as sawn timber (2x4's) and pulp and paper. Diversifying and introducing new industries for communities to capture more value from local forest resources is a primary focus of the *NSFC Strategic Plan 2007-2011*. That said, it is not within the scope of this thesis to closely analyze industry and economic models. **However, it is the role of this thesis to explore and ask: how can communities capture even more value from their local resources? How can envisioning greater integration lead to a sustainable community/system, a better quality of place and strengthen community identity? How can architecture and design improve the built environment within such a new system?**

“For all but the last 150 years of known human history, we have lived off the energy of the sun, the energy of our bodies, the energy of our domestic animals, some wind and water capture, and the burning of biomass, including wood, charcoal, animal dung, and crop wastes.”³⁰

- Labatt and White, *Carbon Finance*

Fig. 4.9 Wood supply for home heating.



Existing Model - forestry communities

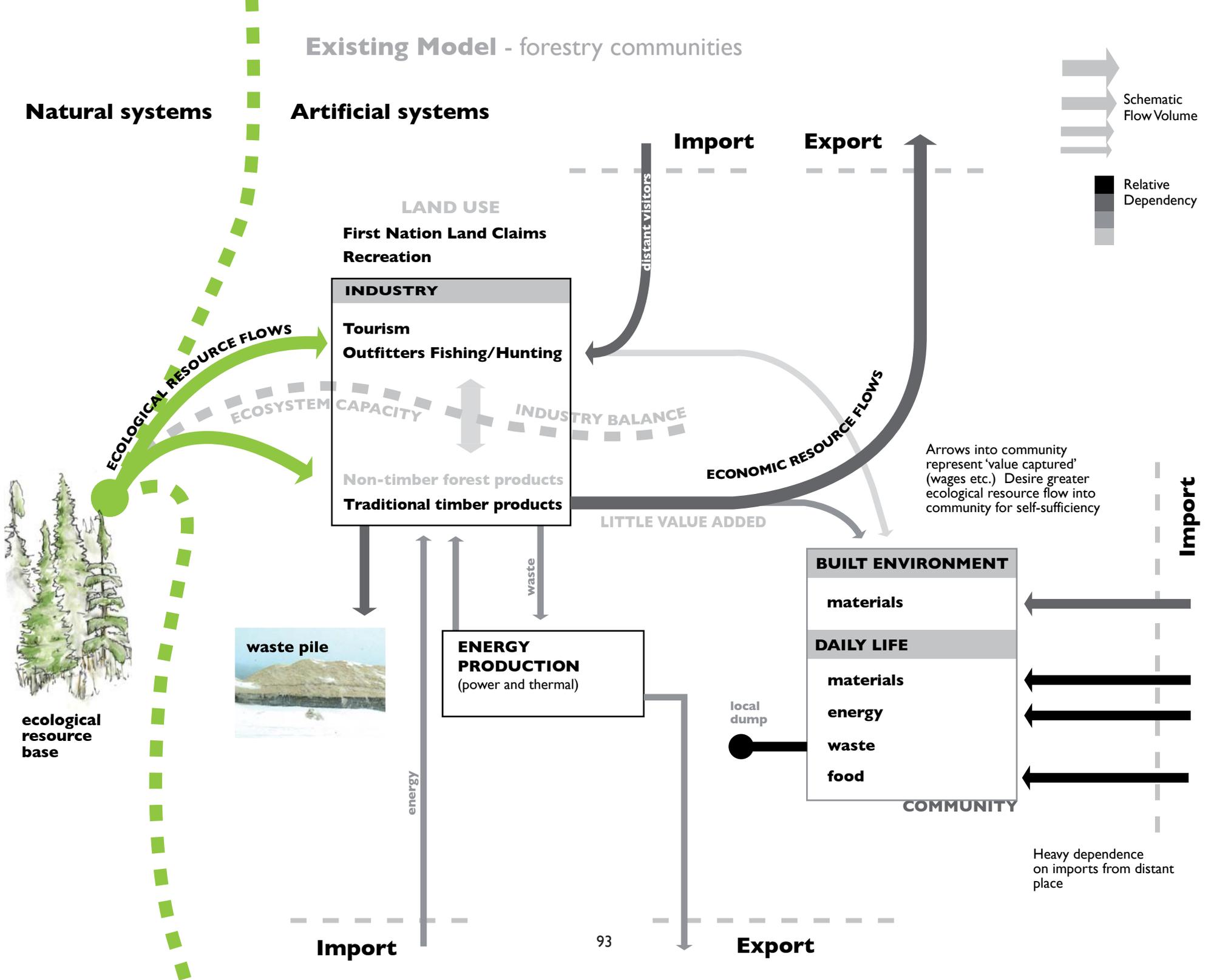


Fig. 4.11 (Right page)

Desired Model - A framework for self-sufficiency

In response to the potential for greater community integration exhibited in the existing model diagram, this diagram shows a desired model between forestry operation, community and local resource-base.

The technology developed during the industrial era allowed society to construct a built environment with larger-scale buildings, dependent on non-renewable resources. Simultaneously, technology also lead most of Canadian society away from self-sufficiency. Today, technology allows society to transform the same energy source (biomass from forests) humans previously existed on (pre-industrial era), into readily transportable and renewable energy forms, such as electricity and district heating. In addition, key components for future self-sufficiency, such as greenhouses for local food growing as well as a tree nursery/non-timber forest product development, are sensible in combination with renewable energy system such as district heating.³² Once again, the opportunity exists for forestry communities to be self-sufficient in terms of basic energy needs, a core necessity for long-term sustainability. An integral part of this transition to sustainable initiatives is the **interface between individual, daily life and the idea of community self-sufficiency: the built environment. Thus, the onus is on architecture to shape this 'interface' in a manner that encourages a widespread embrace of sustainable initiatives.**

Architecture and design

The challenge is to create a framework from which the communities can free themselves of constraining external pressures and allow the local culture to emerge, integrated with its surroundings. **Style, construction, energy and materials are no longer imported, rather they are derived from the local natural resources and embody the craft of these unique communities.** In the next chapter, the thesis develops the potential for architectural and design to embody the ideas of a desired self-sufficiency model, so individuals can experience a vision for sustainability. The design exploration seeks to realize aspects of the built environment that involve the community in sustainable processes.

“When systemic problems are created by the ways we make or build things - quite literally - our most creative opportunity is to remake those very things. Rebuild from the ground up.”³¹

- Anthony Weston, *How to re-imagine the world*

Desired Model - forestry communities

Natural systems

Artificial systems



ecological resource base

ECOLOGICAL RESOURCE FLOWS

ECOSYSTEM CAPACITY

INDUSTRY BALANCE

LAND USE

First Nation Land Claims
Recreation

INDUSTRY

Tourism
Outfitters Fishing/Hunting

Non-timber forest products
Tradition timber products

ENERGY PRODUCTION
(power and thermal)

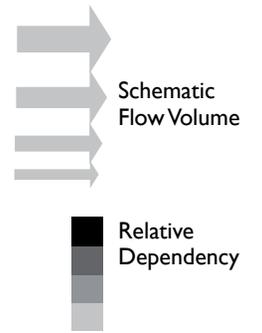
GREENHOUSES

local food production
tree nursery
research and development

(Distant cities)

Import

Export



VALUE ADDED

ECONOMIC RESOURCE FLOWS

BUILT ENVIRONMENT

materials

DAILY LIFE

materials
energy
waste
food

COMMUNITY

Increased resource integration between industry and community for greater community self-sufficiency

Diversified forest economy and more value added (human labour & greater customization of resource) equates to more 'value captured' (wages etc.) in the community

Decreased dependency on imports from distant places

Export

05

“...is there an alternative path to building in the world today, one that engages people where they live and work and recognizes that sustainability is not a luxury but a necessity?”

- Cameron Sinclair, from speech entitled *Design like you give a damn*

05 ARCHITECTURE AND DAILY LIFE

This chapter explores architectural responses that engage residents of forestry communities with ideas of sustainability, identity and quality of place. To ground this exploration, a community from the NSFC is chosen based on specific criteria. From here, the community's built environment is examined with respect to future transitions. Based on the community's history, current identity and needs, as well as discussions with its residents, this chapter compares the **existing community built fabric with a vision of its future potential. The primary focus is to explore the role of architecture and design in envisioning sustainable forestry communities.**

The vignettes showing this potential are intended to demonstrate that local development and design of a regionally responsive built environment could stimulate creativity, raise the collective spirit as well as lead to a local vernacular. Such a built environment – crafted in local resources, while conscious of local heritage – serves to enhance the quality of place, strengthen the local economy and shape regional identity.

5.1 UNDERSTANDING THE BUILT ENVIRONMENT IN SMALL COMMUNITIES

Determining how to go about realizing or communicating ideas of sustainability through architecture is a challenge in small communities. Communities have evolved over the last century, some even longer. Each is unique, in terms of its own history, culture and residents. With populations declining, it is no longer an era of growth for forestry communities; it is a time of transition. With respect to this transitional time, this thesis seeks appropriate ways architecture can contribute towards a long-term vision of sustainable forestry communities.

Approaches

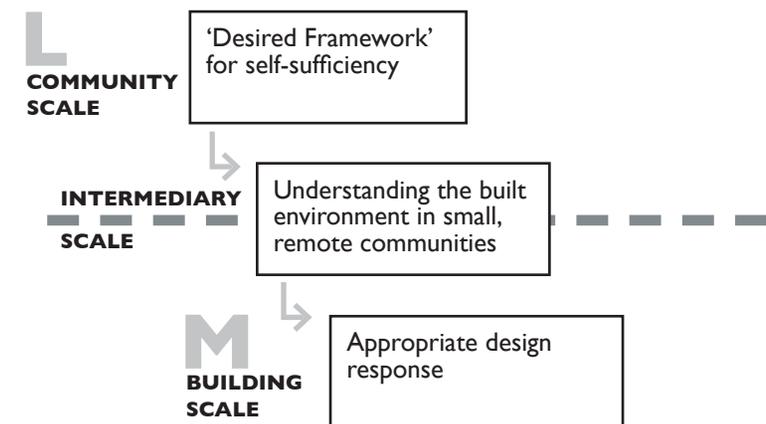
Exploring appropriate architectural response for forestry communities with respect to local resource integration, self-sufficiency and identity evolved through different approaches. During the initial explorations it became evident that **architectural response needed to emerge from a specific community, through its identity and uniqueness of place.** With this in mind, design response ought to visualize what built environment could emerge if guided by principles and ideas of long-term sustainability (as shown by the example in chapter four, a ‘framework for self-sufficiency’). Thus, the built environment acts as an intermediary scale that allows us to envision a new fabric if new processes are adopted (See Fig. 5.1). Before focusing on potential emergence, it was necessary to concentrate on one community in order to gain a better understanding of the built environment in small communities. Accordingly, I selected **Chapleau**.

I was able to visit with Chapleau again, this time for a longer duration thanks to the generosity of a few residents. Upon arriving in Chapleau, discussions with key community informants (contacts made on previous visits with the community) immediately began to shape design responses. It became apparent that appropriate architectural response must largely emerge from the community: its needs as well as desires. These factors were either directly expressed or became apparent indirectly through my outside perspective.

“Along with ecological issues, then, sustainable communities are equally concerned with social and human sustainability – creating and supporting humane living environments, livable place, and communities that offer a high quality of life”¹

-Timothy Beatley and Kristy Manning,
The Ecology of Place

Fig. 5.1



The key informants represented political, economic and cultural aspects of the community, as well as tourism and real estate industries. Two specific designs were generated during my stay to promote discussion and interest; one of which is developed later in this chapter. Undoubtedly, my experiences in Chapleau contributed greatly to the development of the ideas of this thesis.

The built environment, its institutions and daily life

Chapleau is relatively remote as its nearest counterparts, Timmins and Wawa, are both over an hour and half drive away. Location, as well as population base (although roughly half of what it was in 1960²) necessitated the typical essential institutions that facilitate daily life. Institutions such as the post office, the recreation centre, the Legion, churches, the high school and public schools, as well as hospital comprise an integral part of resident's daily life. (See Fig. 5.2) The spaces individuals live and work, the places they gather (in, around, pass through and contemplate), geographic location, climate and character all influence the quality of daily life. This is the 'architecture of daily life', a dynamic construct of interactions between individuals and their surrounding environment, man-made or natural. Thus, the built environment is constantly shaping daily life and the quality of place.

In a small community such as Chapleau, remoteness and size means that new construction garners more attention from residents. Alongside this anticipation however, new construction demands a higher cost of construction per square foot³, and also may stress relatively undersized municipal budgets or cause political disagreement. But generally, new construction is welcomed, as it represents positive activity towards the future.

In Chapleau, the identity of built environment largely reflects the past. Its layout consists of a traditional urban grid with back lanes, as well as some traditional, well-articulated architecture (churches, legion). That said however, it is a transitional time and the NSFC recognizes that "forests will remain the backbone for generating wealth, but the management of the forest, the products drawn from the forest and the nature of the communities themselves will

change in the face of globalization, climate change and complex demographic pressures.”⁴ New construction almost seems out of place given the population declines in Chapleau and surrounding communities. But how will the built environment adapt to meet the challenges of this new era? How can architecture help redirect daily life and contribute to new community visions? How will communities carve out a new identity for themselves? How will communities retain residents, as well as attract in-migrants and business? If forest economies, and thus daily life, are to be refocused towards long-term sustainability – then rethinking architectural response in the built environment becomes a necessary and explorative realm.

How might key institutions be adapted?

Typologically, many key institutions are well defined in Chapleau and work in terms of traditional program. Therefore, adapting the built environment is a gradual process. As older buildings become obsolete – in quality, energy use, function or occupant use – transitions to a built environment focused on sustainability can begin to emerge. Based on research, as well as discussion with community informants, the thesis arrives at a set of working principles to guide architectural response. Fig. 5.7 lists these principles and seeks to realize them through the vignettes envisioning a built environment that might emerge in the future.

A case for architectural response

As a critical interface between the traditional and envisioned communities, it is essential that architecture and the built environment encourage a daily life that is self-sufficient, confident and desirable. It is the role of architecture to help society re-envision what it should strive for. The architectural response in this thesis is directed towards this ongoing objective.

Fig. 5.2 Aerial of Chapleau locating key community institutions. See Fig 5.3 & 5.4 for specific photographs.





1 The municipal office and library.

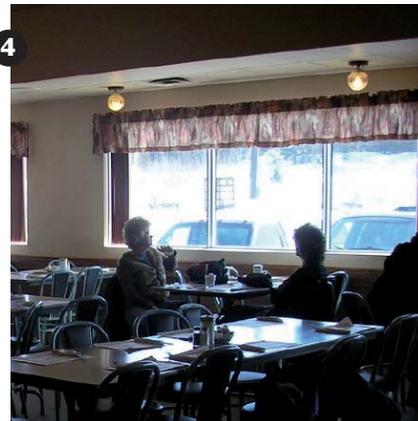


2



3

Fig. 5.3 Photographs 2-4, the post office, grocery store and Aux Trois Mouillin restaurant respectively, are key institutions where residents 'run into one another' as identified by one resident. Mail is not delivered, rather, residents pick up their mail from individual lockers in a communal space at the post office.



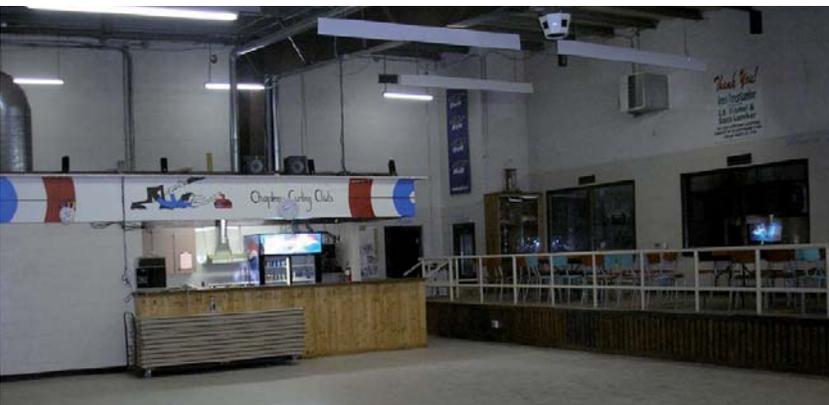
4



4



Fig. 5.4 Photographs 5-7, the public high school and elementary school and the recreation centre respectively, are key institutions for community youth. In Chapleau, the built environment does not effectively engage the youth with respect to local forest resources or innovative places. The bottom two images depict the interior of the recreation centre: left, the lounge adjacent the curling rink and right, the projection screen used to show community movies.



5.2 ENVISIONING SUSTAINABLE FORESTRY COMMUNITIES: *the Role of Architecture and Design*

This section discusses the role of architecture and design with respect to envisioning sustainable forestry communities. It is centered on these questions: What can design do? And how far can it go? Firstly, the relationship between architecture, the built environment and community identity in forestry communities is discussed. Next, the processes and goals of design-based initiatives for greater community sustainability are explored in more detail. And lastly, this section visualizes what the physical fabric of forestry communities might look like through more effective ecological resource flow.

Community identity and the quality of place

How does the built environment contribute to community identity? More than just function and basic shelter, the built environment informs the cultural aspects of the community by expressing a way of life. A role of architecture is to help realize a sense of ownership and identity in the greater context, whether it is individual, community or regional.⁶ If alongside this ownership, a sense of cultural symbiosis with local resources can be distilled through architecture, then identity begins to reflect notions of sustainability. Influencing these thoughts, McMinn and Polo describe sustainability as regionally responsive to climate, geographical context, locally available resources and cultural values.⁷

The identity largely associated with forestry communities is that of unique seclusion, nestled in the boreal forest of the Canadian Shield. In that sense, community identity is closely related to regionalism, taking on longstanding cultural implications of place, but it is also rooted in the built environment and the quality of place. History and context, fundamental in shaping the sense of place, are undoubtedly important to community identity.⁸ But when this community history is threatened to disappear – what happens next?

The built environment in most forestry communities developed in the industrial

“the time is ripe for an approach to sustainable architecture that reaches beyond technological considerations to address a variety of intangible but essential cultural values.”⁵

- John McMinn and Marco Polo,
41° to 66° Regional Responses to Sustainable Architecture in Canada

era, where the function of community systems largely depended on distant, external support. A well-defined shift from dependence on external support to self-sufficiency in forestry communities marks a pivotal moment. But this is yet to happen. New built environments embodying ideas of sustainability, as well as instilling confidence and desirability in the future would support this shift in Northern Ontario. Architecture can contribute to community identity by generating places that encourage the collective envisioning of the future and buildings that are responsive to the needs of the community. Architecture can engage residents in the idea of place and sustainability, through local resource integration and self-sufficiency. In challenging times, it is the role of design to offer new perspectives and visualize opportunity. Through such approaches, architecture and design can help generate community identity in the built environment and thus enhance quality of place.

How does design influencing decision-making?

Design can influence cross-the-board decision-making through the process of visualization. A vision of 'what could be' allows different groups of people to share a common ambition; at the same time however, it must have the foresight to allow those same groups to self-organize and also become designers, formulating their own specific responses within the broader scope of the vision. As John Thackara describes, this is important because "complex systems, especially human centered ones, won't sit still while we redesign them. A sense-and-respond kind of design seems to work better: desired outcomes are described, but not the detailed means of getting to those outcomes."⁹ The approach of the framework in chapter four and vignettes later in this chapter are aligned with the idea of comparing existing and desired.

Identifying the key interest groups who need to be included in the decision-making is another critical aspect of the design process. With respect to forestry communities in Northern Ontario, there are four interest groups whose involvement and process buy-in is instrumental to achieving any long-term vision of sustainability: community residents and nearby First Nations, the municipality, provincial and federal governments, as well as industry.

Influencing those interest groups to share a vision of long-term sustainability necessitates new visions as well as experience. Torbjorn Lahti, a planner and economist involved with the emergence of Sweden's first Eco-municipality, has been at this preliminary stage. In *The Natural Step for Communities*, he offers his experience:

- *Establish a sustainable framework, in others words, 'a common language.'*
- *Design a change process that is democratic in nature and has broad involvement.*
- *Community-defined vision of the future. As well, a leadership process that facilitates the common vision.*
- *People become interested in sustainable development only when someone sells it to them in the best possible way.*
- *It is easier to embrace a new way of thinking when there is a compelling reason to do so.*
- *Initiatives need to be seen as emerging from what is already happening in the community.*
- *Need to introduce in a manner that creates the greatest possible engagement (both municipal and community).*
- *Generate the political will to carry out the process.*¹⁰

Design has the means to both generate and compliment aspects of his advice: political will, as well as community interest for sustainability and a common vision for it. Design can also emerge from the unique cultural aspects of the community. In addition, design can help visualize what such changes might look and feel like. How might design influence and bring together different interest groups surrounding forestry communities? How might design fuel participation and long-term commitment? The following page (Fig. 5.5) frames the current perspectives of each key interest group on comprehensive community sustainability and how design might influence those perspectives.

Fig. 5.5

CURRENT PERSPECTIVES

HOW DESIGN MIGHT INFLUENCE

COMMUNITY RESIDENTS

- Difficult to adjust to long-term outlook with mill closures and traditional livelihood gone
- Need support with respect to transitional time

- Support future outlook with sense of destiny
- Engage with visualization; inspire residents to contribute/ become 'designers' within the larger framework

MUNICIPALITY

- Lack of resources and support; must also deal with eroding tax-base
- Typical process: funding and efforts towards one building, not towards comprehensive adaption of built environment

- Generate the political will (the role of municipality is key to transitional process)
- Provide a more holistic perspective on community systems and how to enhance ecological resource flow
- Compliment proposed initiatives (such as NSFC Strategic Plan)

PROVINCIAL & FEDERAL GOVERNMENTS

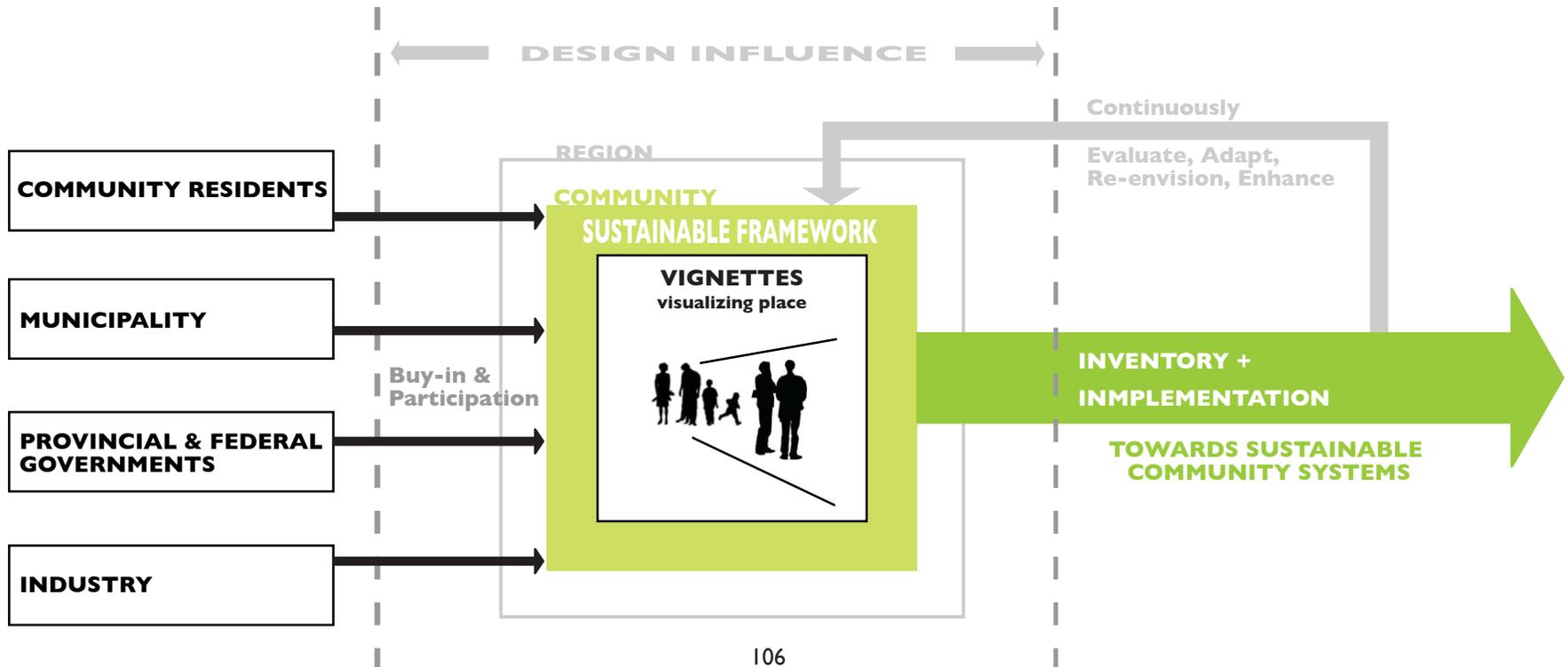
- Small, declining populations and struggling industry challenging; current systems make it difficult for fundamental changes
- Government departments too specialized, lack shared long-term vision of sustainable communities in Northern Ontario

- Illustrate the potential of forestry communities; as well as long-term value to stabilizing and diversifying the country
- Generate political will, long-term commitment to enhancing the quality of place and sustaining communities, as well as the support and resources to ensure this can happen

INDUSTRY

- Focused on dealing with external factors, as well as declining forest integrity
- Profit focused, not community focused
- Narrow vision, restricted by forestry system

- Commitment to community sustainability
- Emphasize the need for greater resource integration between forestry/community systems



“From thinking of ourselves as the authors of a finished work, we had better evolve toward thinking of ourselves as facilitators whose job is to help people act more intelligently in a more design-minded way, in the systems we all live in.”¹¹

- John Thackara,
In the Bubble, Designing in a Complex World

Architecture, Design and Visualization

The challenge is to address the town as an organism or system, and visualize how fundamental changes to human ecology could affect the built environment as well as have regional implications. This thesis contends that the role of architecture and design is to strengthen the quality of place and sustainability of forestry communities by providing methods of visualization. These methods, above all else, are means to generate interest and bring attention to the potential of Northern communities. In this thesis, two methods are pursued:

Visualizing a desired framework for sustainable community systems allows for specific initiatives and processes to self-organize and emerge bottom-up through the community (An example is offered in chapter 4). Here however, resources, expertise and appropriate tools for collaboration are necessary to make transitions to such a framework reality.

Visualizing places/built fabrics that might emerge under the principles of such a framework. Envisioning emergence in Chapleau allows interest groups a glimpse at the potential for a broadened quality of life. These vignettes are also intended to illustrate why design matters in long-term decision-making.

If interest groups (especially the residents) are to be empowered as an integral part of the design process towards the long-term vitality and continued existence of forestry communities, then there must be welcoming and adaptable places that generate opportunities for self-organized learning, inspiration, collaboration and visualization.¹² Places that bring together needed local skill, innovation and recruited expertise, as well as engage the young generations. Another role of architecture and design is to imagine what kind of places could emerge from/ contribute to processes of self-organization and sustainability. The vignettes that follow visualize what some of these places might be and look like.

THE BUILT ENVIRONMENT

EXISTING FABRIC

Fig. 5.6 Aerial view of the existing built environment in Chapleau, looking northeast. Photo courtesy of Hugh Kuttner, taken in 2000.



Fig. 5.7 ADAPTING THE BUILT ENVIRONMENT

DESIGN PRINCIPLES

• **Regionally responsive buildings, to place and local materials**

• **Envision desired quality of life and built environment to realize it**

• **Design for deconstruction, potential future improvements to energy systems and building envelope**

• **Involve community in the creative process of building**

• **Contribute to a long-term vision of sustainable forestry communities and regional identity**

• **Develop attractive living environments and enhanced quality of place to attract individuals and families into the region**

• **Provide framework for interaction between the community, the region and distant urban centers**

• **Engage the community youth; capture the interest and attention of the youth to stay in the region and innovate**

• **Emerge from the needs of the community**

• **Educate and inspire residents towards energy-based and material-based transitions**

REFERENCE

• *41 to 66°: Regional Responses to Sustainable Architecture in Canada*
 • *Towards Regionalism*

• *In the Bubble, Designing in a Complex World*
 • *The Ecology of Place*

• *Construction Ecology, Nature as the Basis for Green Buildings*

• *The Natural Step for Communities*
 • *Dwellings, The Vernacular House World Wide*
 • *Built by hand,*

• *The Natural Step for Communities*
 • *Northeast Superior Forest Community Strategic Plan 2007-2011*

• *Small, Rural, and Remote Communities: The Anatomy of Risk*
 • Key informant, Chapleau

• *The Natural Step for Communities*
 • Key informant, Chapleau

• *Small, Rural, and Remote Communities: The Anatomy of Risk*
 • *Northeast Superior Forest Community Strategic Plan 2007-2011*
 • Key informants, Chapleau

• *Youth Survey (2007) & Key Informants, Chapleau*
 • *Northeast Superior Forest Community Strategic Plan 2007-2011*
 • *The Natural Step for Communities*

• Key informants, Chapleau
 • *Dwellings, The Vernacular House World Wide*

THE BUILT ENVIRONMENT HOW MIGHT IT EVOLVE ALONGSIDE A SUSTAINABLE FRAMEWORK?

During this transitional time for forestry communities, it is important to envision how the 'parts' of a sustainable framework might emerge in the future and adapt the built environment, both to improve self-sufficiency and enhance the quality of place in forestry communities. A role of design is to empower residents as integral to the processes leading to the long-term sustainability of their communities, through ideas and frameworks that inspire and support them. Another role is joining community, industry and various levels of government in shared visions and collective action. Towards this ongoing process, this section is intended to encourage the imagination of evolving daily life in remote, forested regions of Canada, as well as appropriate architectural response that supports this potential.

A theme throughout the vignettes is the idea of convergence. In addition to engaging different interest groups, the images illustrate: convergence between community, identity and local ecological resources; a sense of place shared by visitors, temporary and permanent residents alike; and lastly, the convergence of past industry-focused systems with the need for new sustainable systems.

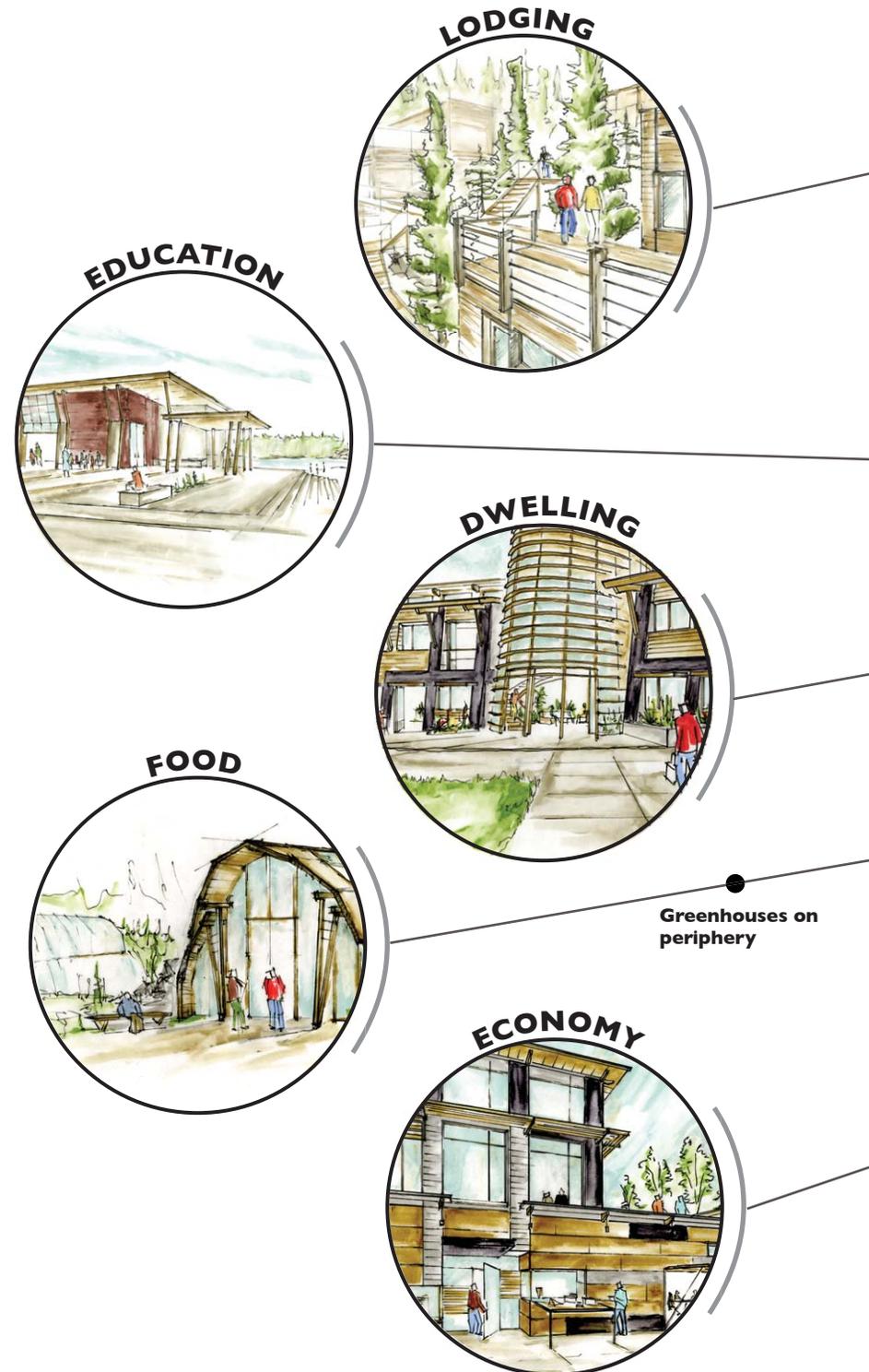
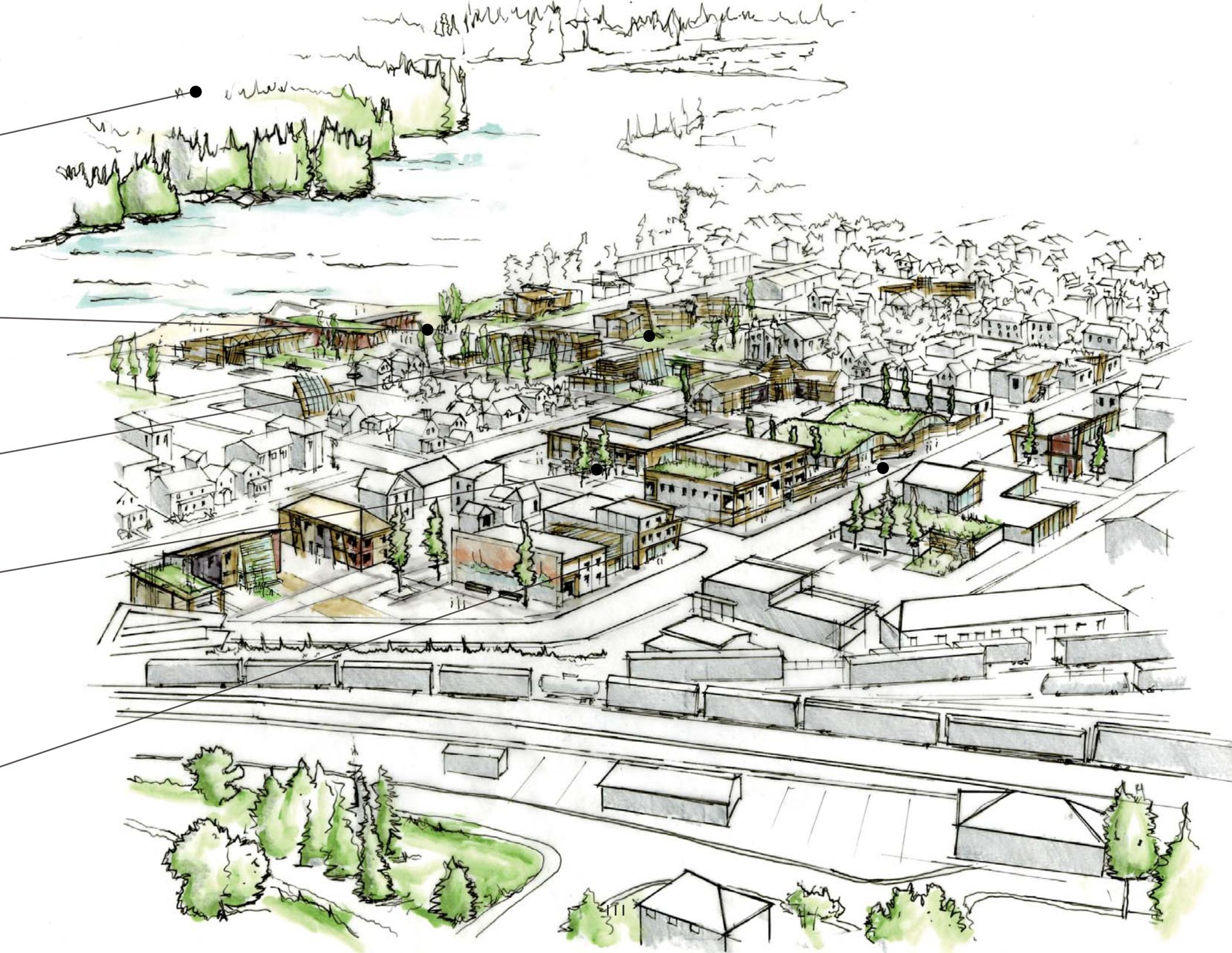


Fig. 5.8 Aerial view of Chapleau with an evolved fabric in the future, looking northeast. Black and white buildings are existing, with coloured buildings showing an adapted built environment.



EDUCATION ENGAGING THE YOUTH WITH LOCAL ECOLOGICAL RESOURCE INTEGRATION & INNOVATION

Fundamental changes in the way people perceive things often begins with education. Education however, comes in many modes. Architecture and design must offer the visual modes of education both through built, tangible forms, as well as through alternate visions of paths and places yet to be realized. Sited along a natural attribute, the Chapleau river (most Northern communities offer their own unique setting), the vignette (Fig 5.10) envisions a place that exposes local residents and visitors to the ideas local resource integration, self-sufficiency, as well as community identity. The two buildings seek to captivate youth by providing two learning environments. One is more formal, an elementary school re-envisioned through locally responsive design principles. The other is responsive to the needs expressed by the NSFC strategic plan and youth themselves: the need for an interesting place for youth to gather and hang out, where youth and other residents can casually be exposed to history, culture, ideas and innovations, as well as involved with workshops and presentations. The site also provides a portal to for those travelling to local wilderness outfitters, connecting visitors to the community. Lastly, the site serves to reinvigorate the community waterfront and enhance the quality of place.

In terms of construction, the buildings in the vignettes are intended to illustrate wood value-added design as well as ecological resource flow into the community. The designs are intended to potentially be constructed by the community, using local materials for the primary building structure and envelope. The idea of human craft is aligned with the intentions behind a new speciality cedar mill established in recently in Chapleau (winter 2008) that is focused on more human labour and customization; and hence more value captured by the community.



Fig. 5.9 View of existing built environment at the riverfront. Existing elementary public school on the left.

EMERGING FROM THE COMMUNITY

NSFC STRATEGIC PLAN 2007-2011

- “To create new learning opportunities for youth that will engage future generations in the development of value-added & entrepreneurship in Northern Ontario.”

- “Develop tools to engage rural communities and companies in building sustainable and resilient forestry-community systems.”

- “To develop a population capable of adding value to the forest resources both before & after harvest, development of new education and training institutions ... it demands culture change only our community can undertake.”

KEY INFORMANTS

- “Need to be a distinct community, with a focus/vision.”
- “Need a living example, transforming the community without imposing.”

YOUTH SURVEY

(carried out by community of Chapleau, 2007)

- “I hope this means teens will have a place to go.”
- “Youths do not know how to occupy their free time.”
- “A cleaner beach for swimming would be nice.”
- “Need a new place for kids like a rec room.”
- “I would like a place to go and hang out when its cold outside.”

Fig. 5.10

**EDUCATION ENGAGING THE YOUTH
WITH LOCAL ECOLOGICAL RESOURCE
INTEGRATION & INNOVATION**



ELEMENTARY SCHOOL



**GATHERING PLACE FOR
YOUTH & VISITORS**

ECONOMY HOW MIGHT THE MAIN STREET EVOLVE TO PROMOTE NEW DEVELOPMENT?

How can the built environment support long-term objectives for sustainability, such as the goal stated to the right by the NSFC? How can building typologies and public space enhance the quality of place as well as attract distant business and in-migrants to choose the community? One idea is to rethink the role of the main street, traditionally set up to service the community. In light of the new focus of Chapleau and the NSFC, perhaps an additional role might emerge on the main street: a hub for forest research and innovation, as well as an incubator for small businesses. Such place could bring together a range of individuals: recruited expertise, local industries, potential investors and draw resident interest. The large span of interior space would be adaptable to different and evolving uses, groups and events. The street façade also transforms, opening in the summer months. The building is intended to become a focal for collective involvement, as well as encourage residents to actively participate in the development of sustainable processes.

Fig. 5.11 Showing potential evolution of main street.

1929



2008



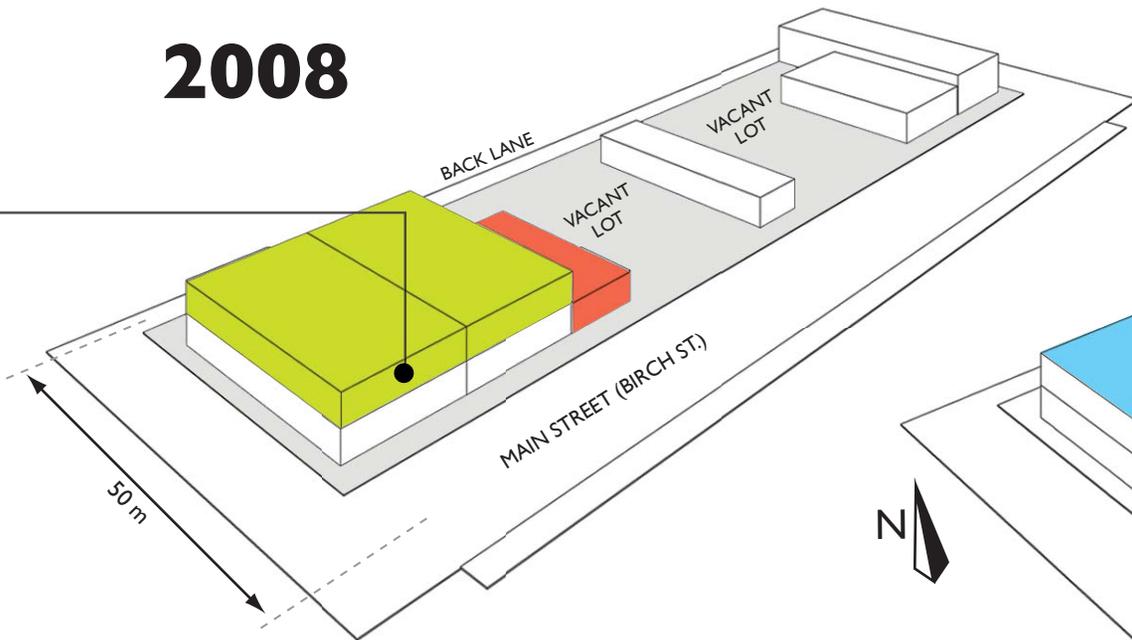
“NSFC plans to become a world leader in economic development based on utilizing forest products more effectively and creating new sustainable employment.”

- NSFC Strategic Plan 2007-2011

EXISTING FABRIC

- RESIDENTIAL
- ECONOMIC DEVELOPMENT OFFICE
- COMMERCIAL
- BLOCK

2008



EVOLVING FABRIC

MAIN STREET HUB:

- **FOREST RESEARCH & INNOVATION**
- **SMALL BUSINESS 'INCUBATOR'** - a shared space to encourage small business development; a stable, supportive environment with shared resources for less initial risk.

- ADDITIONAL RESIDENTIAL
- ACCESSIBLE EXTERIOR ROOF AREA
- ADAPTABLE OFFICE MEZZANINE
- LONG SPAN OVER VACANT LOTS (LARGE ADAPTABLE SPACE)

2015?

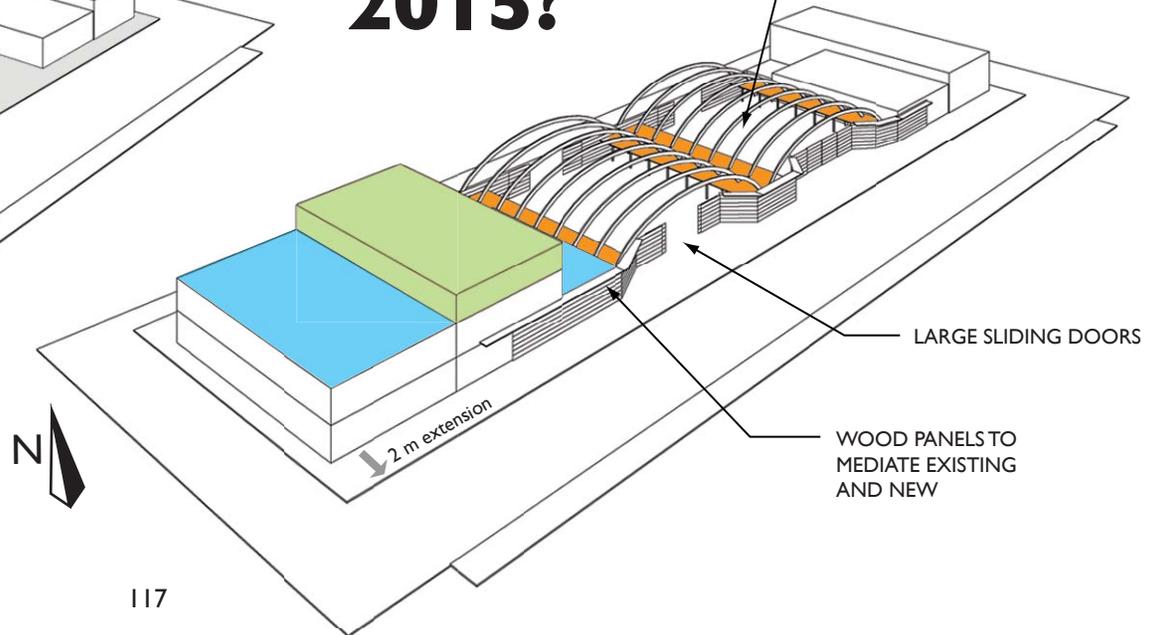




Fig. 5.12

ECONOMY HOW MIGHT THE MAIN STREET
EVOLVE TO PROMOTE NEW DEVELOPMENT?



DWELLING HOW MIGHT ORIENTATION, TYPOLOGY & COMMUNITY SYSTEMS EVOLVE?



Fig. 5.13 Left: residential street on grid layout (isometric view shown below) in Chapleau.

Fig. 5.14 Below, across spread: how might the traditional grid evolve towards more ecologically responsive dwelling design in terms of typology, materials, orientation and community systems?



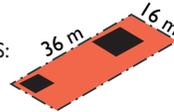
The vignette on the following page illustrates a group of dwellings in a duplex-like typology that could emerge.

EXISTING FABRIC TYPICAL RESIDENT BLOCK

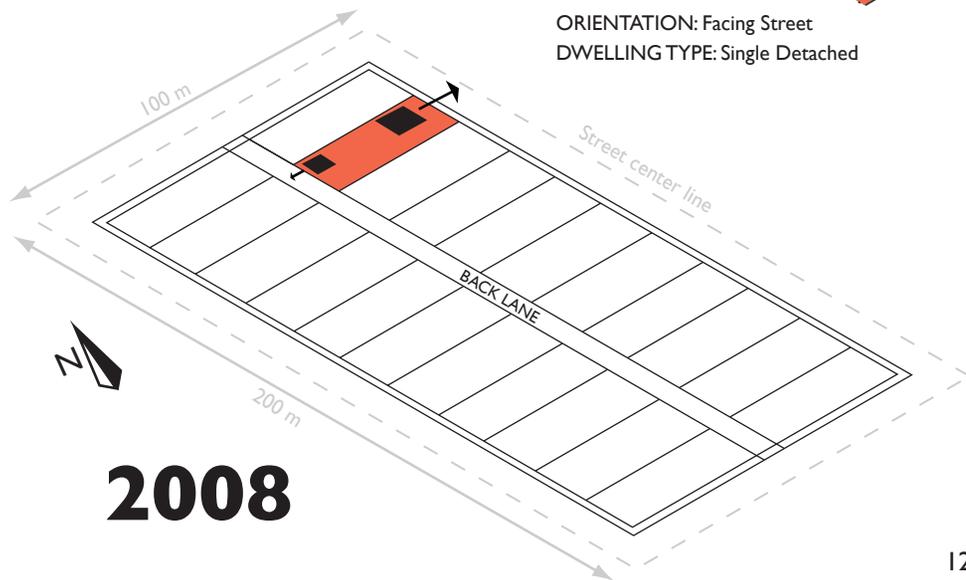
DENSITY PER HECTARE:
10-12 Detached Dwellings

TYPICAL RESIDENT LOT

TYPICAL LOT DIMENSIONS:



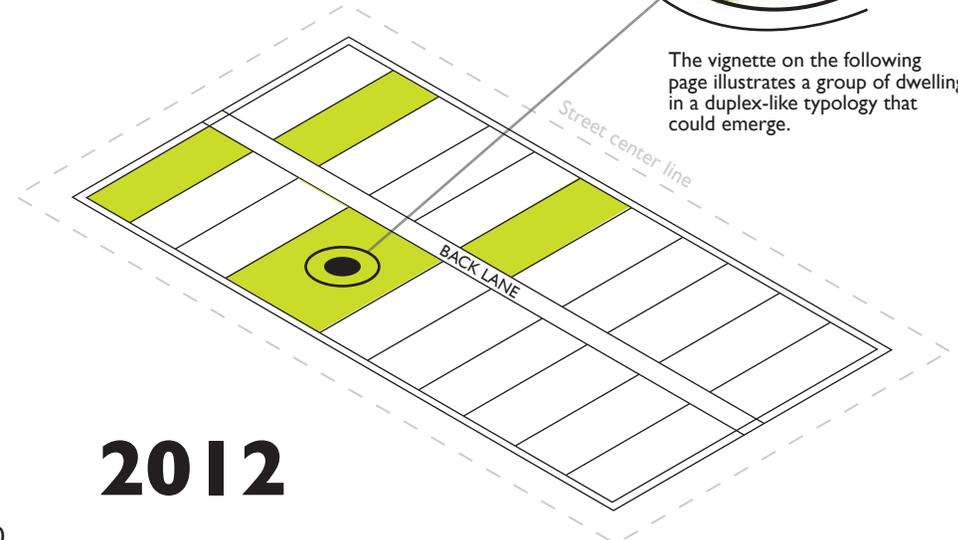
ORIENTATION: Facing Street
DWELLING TYPE: Single Detached



2008

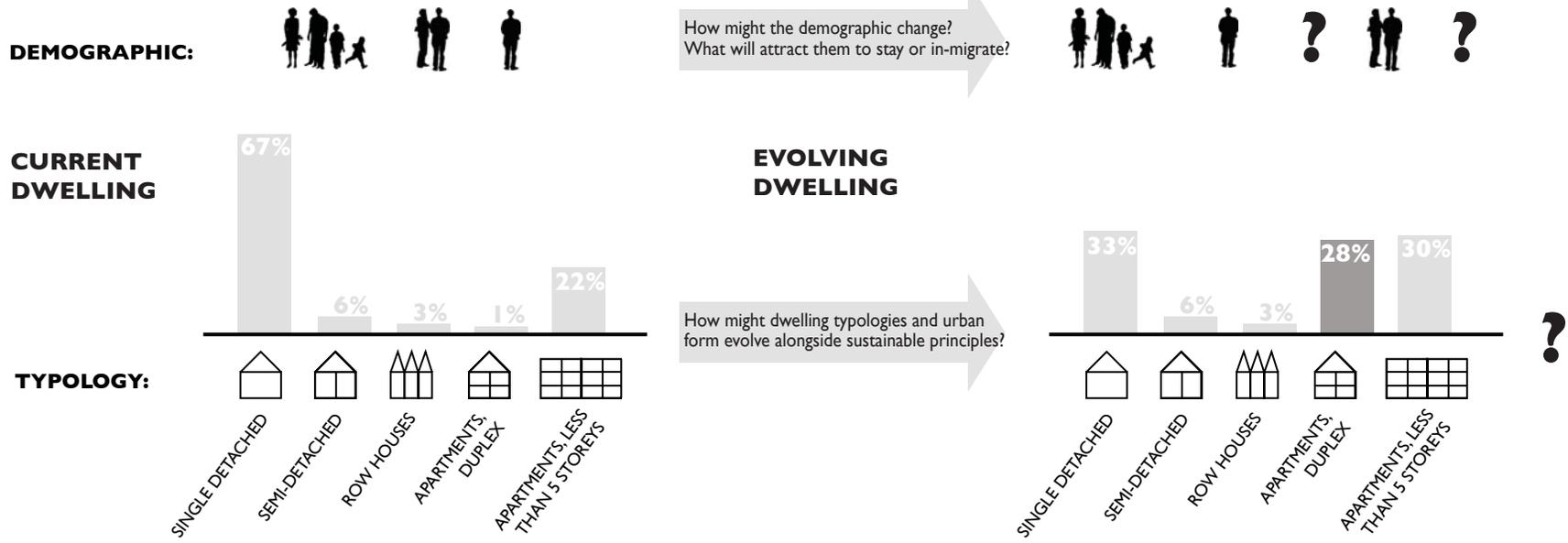
EVOLVING FABRIC: LOT TRANSITION

As dwelling lots become vacant, obsolete or need significant upgrades, a transition to a different typology could take place. Consolidating such lots and encouraging transitions to more ecologically responsive building typologies could allow a new fabric to emerge.



2012

Fig. 5.15 Facing page; how might community dwelling characteristics adapt alongside the principles of a sustainable framework?



EVOLVING FABRIC: QUALITY OF PLACE

What new high quality living environments might encourage residents to make transitions to different dwelling typologies?

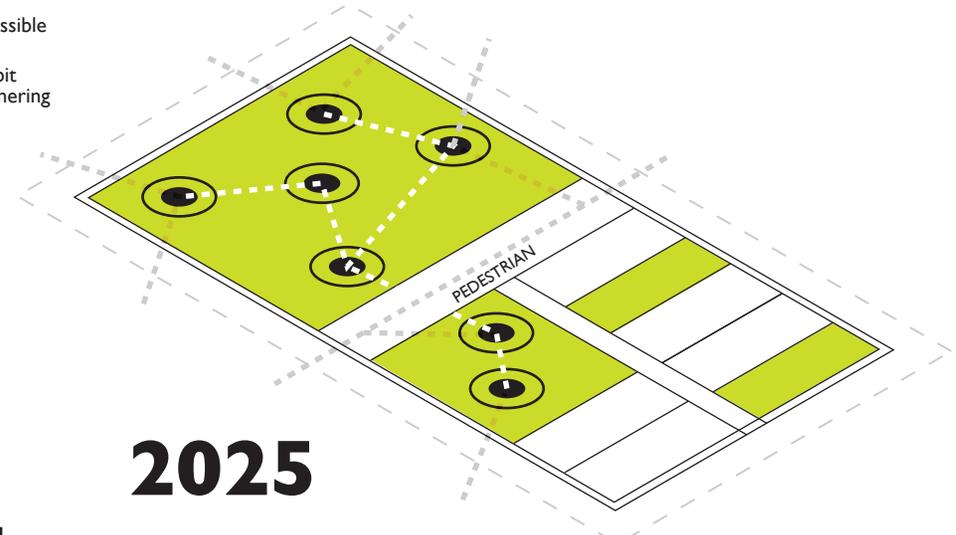
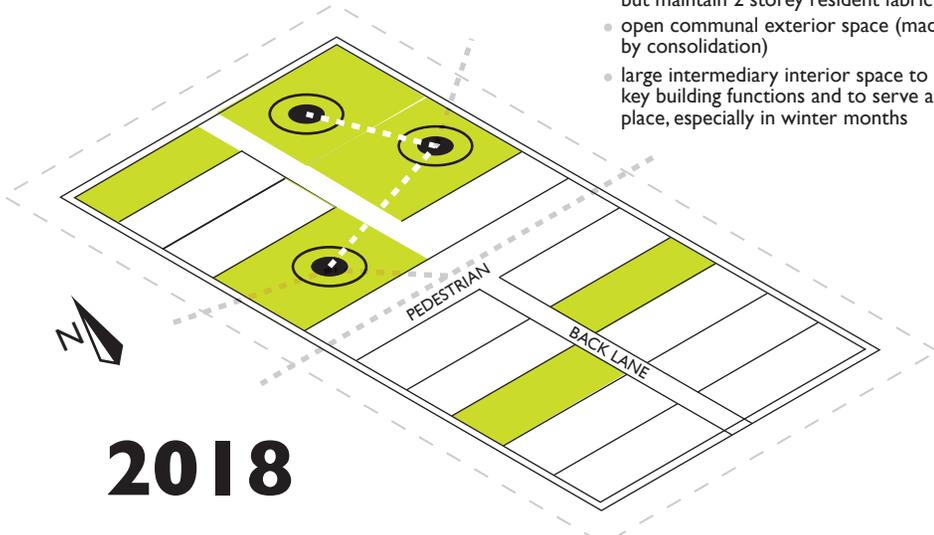
POTENTIAL DENSITY PER HECTARE:
20+ Dwellings

ECOLOGICALLY DESIRED BLOCK CHARACTERISTICS:

- south orientation of dwellings to capture solar energy
- adjacent or stacked units for greater energy efficiency & district heating, but maintain 2 storey resident fabric
- open communal exterior space (made possible by consolidation)
- large intermediary interior space to exhibit key building functions and to serve as gathering place, especially in winter months

EVOLVING FABRIC: A DWELLING SYSTEM

Alongside a sustainable framework, the urban form could self-organize into a dwelling system that is responsive to the unique local ecological and cultural characteristics of the community and region.



DWELLING HOW MIGHT ORIENTATION, TYPOLOGY & COMMUNITY SYSTEMS EVOLVE?

Fig. 5.16 A multi-unit dwelling oriented south to capture solar energy; a shared communal space joining units is intended to provide a comfortable intermediary environment in the winter months. Materials for primary structure and envelope could be derived from local forest resources.





FOOD HOW MIGHT LOCAL NETWORKS OF PRODUCTION AND PLACES THAT ENCOURAGE PARTICIPATION EVOLVE?

Local food production, tree and plant nurseries as well as research and development towards new forest industries are initiatives that could take place locally under greenhouse environments. Using wood waste to provide suitable indoor growing conditions is feasible and it encourages more effective local resource integration. Design is a means of exploring what this facet of local self-sufficiency and economic diversification in forestry communities might look like.

What architectural forms and local materials will give identity to self-sufficiency and local food culture?, as well as generate enjoyable places to gather while engaging in such activities? Rising energy costs (and hence rising food costs) could significantly increase community interests in such processes.



Fig. 5.17 Below left, there is interest in indoor growing schemes, as shown by this small backyard greenhouse in Dubreuilville. Encouraging small initiatives such as this to 'grow' into larger processes allows ideas of self-sufficiency to emerge from residents. Below, a view inside a potential greenhouse that uses wood from forest resources as structure and a local aesthetic.

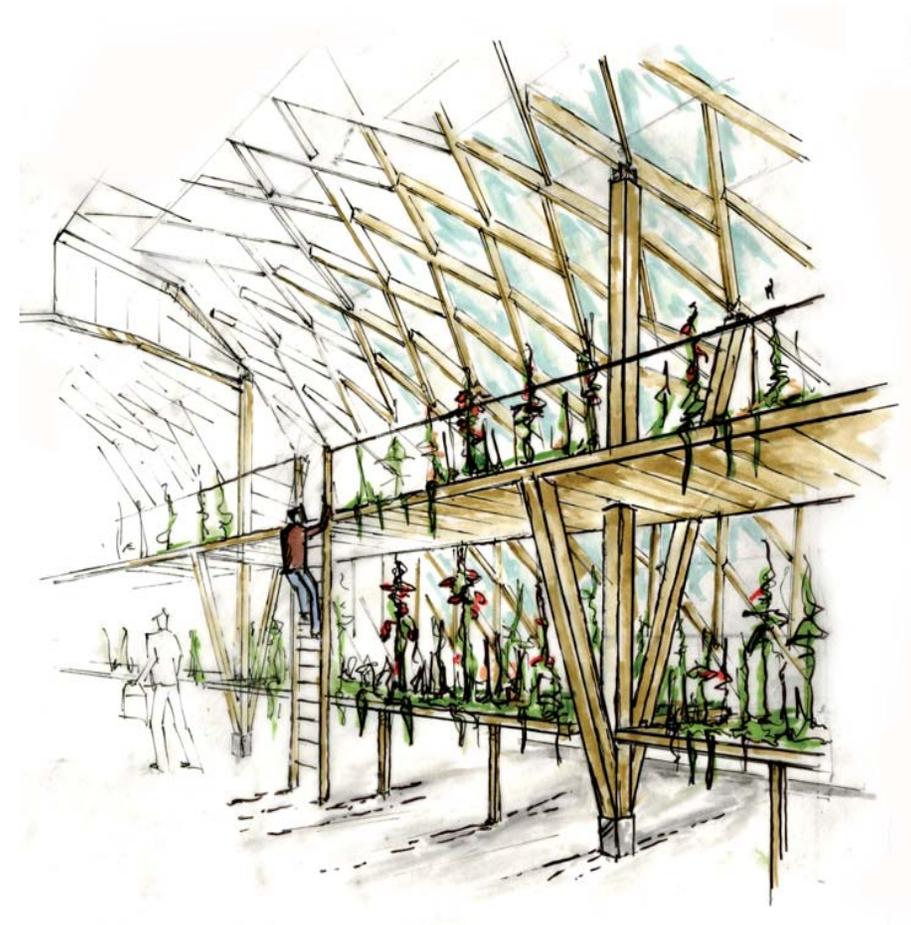
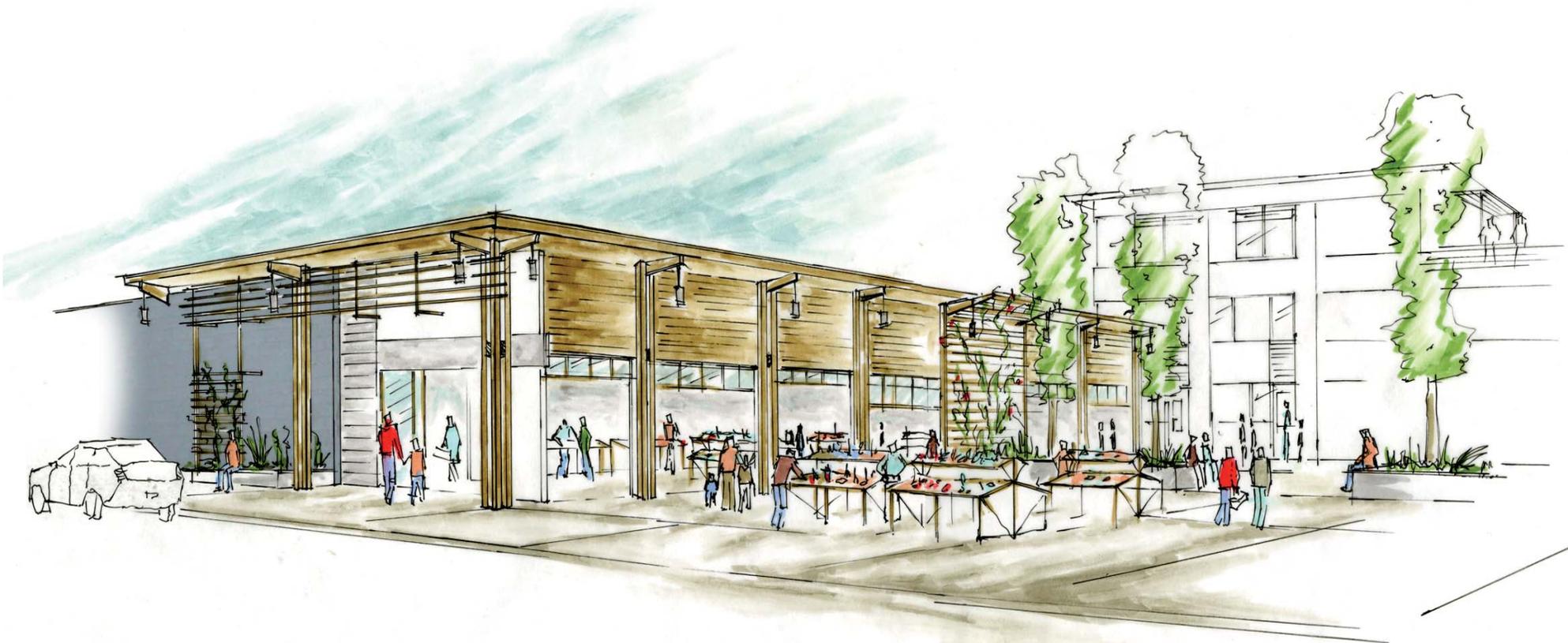
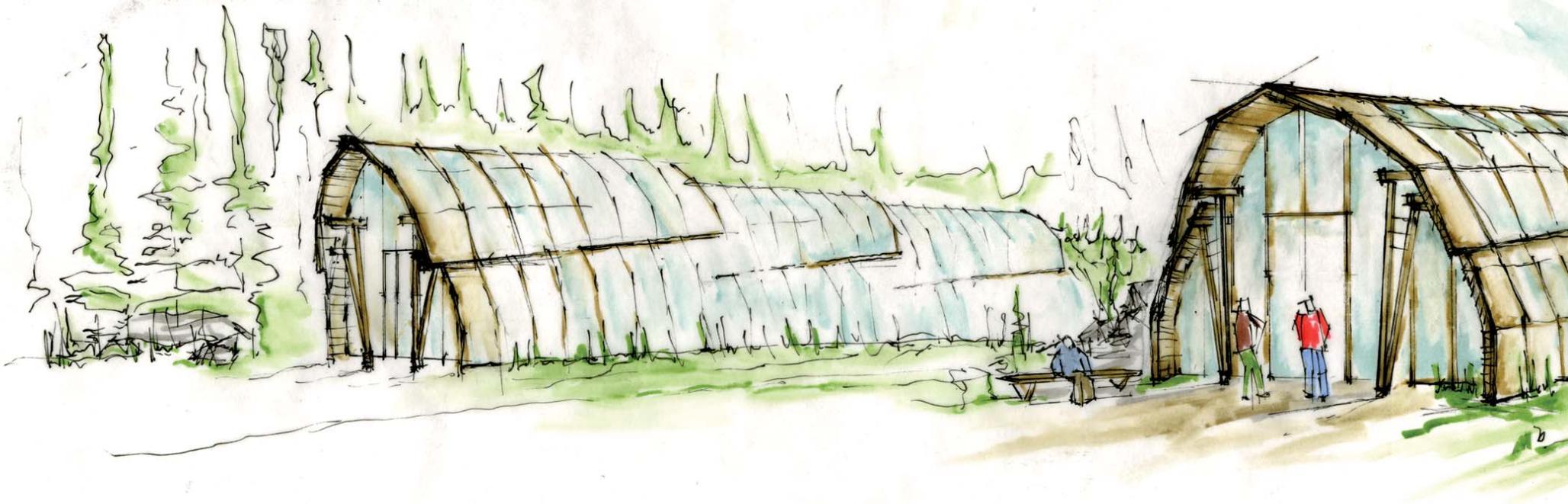


Fig. 5.18 Right, a view of the existing grocery store in Chapleau accompanied by view of a potential place of local goods and produce exchange that could emerge. A southwest facing addition could capture solar energy with the stone mass of the existing exterior wall during the winter and large doors could raise open during the summer months.



**FOOD HOW MIGHT LOCAL NETWORKS
OF PRODUCTION AND PLACES THAT
ENCOURAGE PARTICIPATION EVOLVE?**

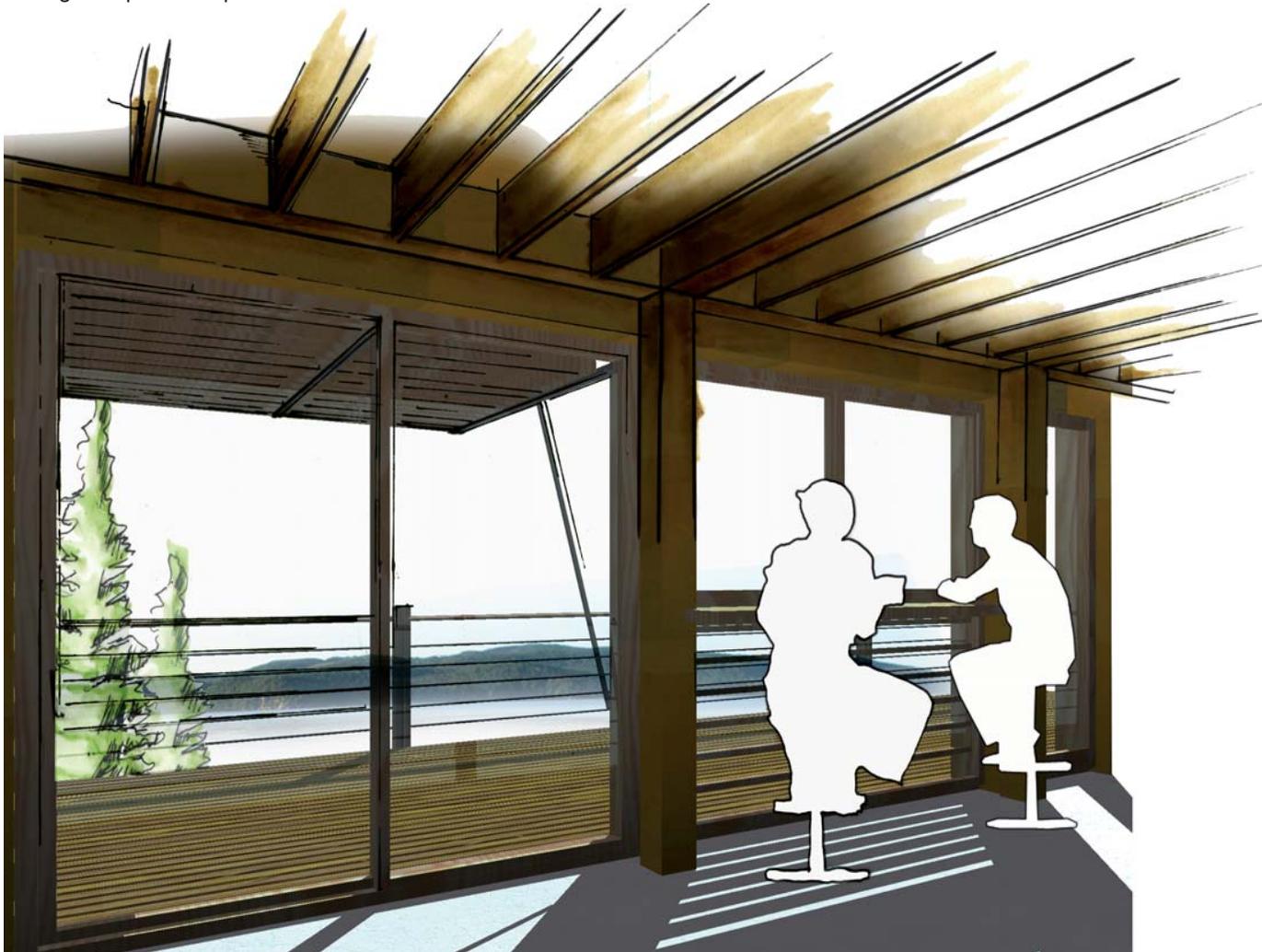
Fig. 5.19 Exterior view of greenhouses, located on the town periphery.





ECOLOGICAL LODGING: ALLURING DISTANT VISITORS AND INVOLVING THEM IN LOCAL PROCESSES

Fig. 5.20 Design can offer examples of high quality, low ecological impact lodgings that could attract people to the region, as well as strengthen the local economy. The craft of appropriate dwellings for temporary or long-term visitors ought to be responsive to the local terrain and views, materials, as well as ecological stewardship. Local experiences for distant visitors should be directed at enhancing regional identity, involving the visitors in the local culture and unique processes of sustainability. Below, a potential interior view across a lake in the region; facing page, clusters of lodgings could provide groups of visitors with a unique, low ecological impact atmosphere.





5.3 'VERNACULAR' ARCHITECTURE

The topic of vernacular is fundamental to architectural conversation. Cultures all over the world are often identifiable by their vernacular architectural forms. It describes buildings embedded with a cultural story:

*“Vernacular architecture is the expression of know-how acquired through centuries-old experience, passed on and enhanced from generation to generation . . . dictated by the local microclimate and the natural resources that could typically be found in the region”*¹³

In remote forestry communities this traditional mode of identification largely does not exist; the architectural styles, materials and forms are mostly transplanted. The built environment in forestry communities does not exhibit regional response and as a result, lacks identity. Marcel Vellinga, writing about the role of vernacular architecture in the 21st century, brings forth the position that all buildings “are authentic cultural expressions in themselves” and that vernacular traditions should be viewed as an ongoing process constantly changing alongside the evolving cultural context.¹⁵ He contends that vernacular describes more than static buildings from the past, as the ongoing process will have “an invaluable part to play in the creation of a sustainable built environment for all.”¹⁶ Local vernacular building processes can and ought to emerge as part of local sustainability.

Population out-migration from Northern Ontario communities is not slowing. Towards sustaining forestry communities, there is a need to develop unique, ecological and sensible ways to address their future living environments. However that said, the emergence of vernacular buildings does not occur overnight. It is an ongoing, evolutionary process, arrived at through aggregated approaches. But it must start somewhere. This research contends that greater ecological resource integration at the regional, community, built environment and individual levels, eventually ought to lead to a **local ‘vernacular’: a built environment that is identifiable with the region.**

“... truly sustainable buildings need to relate more fully to the concept of locality and place.”¹⁴

- John McMinn and Marco Polo,
41° to 66° Regional Responses to Sustainable Architecture in Canada

The vignettes in this chapter are intended to provide an example of what regionally responsive buildings might look like. Community and individual involvement in the design process, as well as opportunities to physically craft their own living environment, is integral to the acceptance of new approaches. If you build it, you are more likely to use it. In addition, Paul Oliver in *Dwellings, The Vernacular House World Wide* indicates that in many cultures residents are closely related to the building process, expected to have the ability to construct or at least contribute to the process.¹⁷ Community involvement, coupled with the proper support (sustainable framework and principles, recruited expertise, local resources, education and knowledge base etc), encourages the emergence of a sustainable built environment that reflects local forests resources from the community itself. In the case of forestry communities, this future emergence of a 'vernacular' architecture would enhance the quality of place, and represent resilient identity.

06

06 ENVISIONING SUSTAINABLE FORESTRY COMMUNITIES

This final chapter focuses on past, current and potential living environments of Northern Ontario communities towards a discussion about what will contribute to a desirable and sustainable future. Through this line of thought, the chapter attempts to gauge the role of architecture with respect to sustaining forestry communities. The long-term challenge of enhancing the quality of place and life in light of declining populations, may require re-thinking the systems in place. Are we as a country, up to the challenge? This chapter is in a sense, a call for widespread involvement towards regionally responsive living environments, especially those distant and unique from the large urban populations of southern provincial regions. Lastly, the chapter summarizes the thesis process, design challenges and lessons learned in the conclusions.

6.1 REGIONAL STABILITY, IDENTITY AND SUSTAINABILITY

Looking ahead: visions of boreal forest communities

In order to maintain stability in regions linked closely to the extraction of natural resources (a process intrinsic to the national economy¹, and thus to the national quality of life), it is important to strengthen relationships between distant cities and the rural and remote communities of these extraction regions. Accordingly, the term 'we' is used to represent Canadian society. The intention is to point out that the ongoing sustainability and diversity of places populating the vast Canadian landscape requires the efforts and attention of many.

Where we've come from...

Historically, the 'primary economic benefits' from resource development in northern regions flowed into the 'southern hands' of Canadian society.² As a result, the built environment of communities in these regions often reflected these earlier mindsets, taking on a functional form and identity.³ Coupled with instability of resource sectors, the built environment shaped a way of life often accompanied by a sense of temporality. In the late 1960's, Richard Rohmer put forth a grand scheme called the 'Mid-Canada Corridor'. At the time, the scheme provided a tangible vision for developing a corridor across the northern provincial regions. Although the scheme was primarily concerned with the exploitation and development of the abundant natural resources, it also highlighted the inadequacy and shortsightedness of northern settlements.⁴ The scheme did not proceed but at least, if only briefly, awareness was raised with respect to the quality of built environment in northern regions.

A consistent *'waver[ing] between neglect and enthusiasm, between southerners either anxious to develop northern resource or content to ignore the region'*⁵ has in part led to a divergence in the quality of place between provincial north and south in Ontario.⁶ During the last couple of decades, the creation of new towns for resource extraction was discouraged and is now very unlikely in the future.⁷ Traditionally, this brought distant planners and designers together to

produce new ideas towards built environments in remote regions. These past approaches, however, lacked community integration with local resources, and shortsighted resource management (resource depletion or external economics) often plagued communities.⁸

Where we are ... and the direction we are headed

Currently, the built environments of northern communities have aged, and often come across as remnants of the past century's industrial focus. Many of the peripheral regions in Ontario, especially those in the North, are in decline.⁹ Of the communities dependent on forestry, many are in crisis.

The built environment in northern regions does not instill confidence in long-term sustainability (low housing prices are one indicator). New meetings between design-oriented minds seem unlikely to surface with respect to the built environment, local resource integration and long-term community sustainability. However, as we enter a new era of development centered on sustainability, this is no longer acceptable. Maintaining a stable network of boreal forest communities is a complex challenge, but necessary to undertake.

It is a transitional time for forestry communities, as well as the built environment within the communities. The reality of the situation is very complex; a wide range of factors make it difficult for communities to sustain themselves.¹⁰ Understandably, the direction of the communities is centered on economic

Fig. 6.1 A young family waits for a train to Sudbury outside the dated train station in Chapleau. What will the next generation be like for these communities?



conditions and revitalization through new approaches. This often equates to a lack of attention on the built environment and quality of place. In light of this, it is important to ask: what community systems and built environments will survive the next hundred years? Is there an appropriate regional architecture that can lead forestry communities into the upcoming era of sustainable development?

What do we really want? And how might we get there?

Given the instability of forestry communities, a reasonable objective would be to aim for regional stability, identity and sustainability through a network of relatively self-sufficient communities.

New initiatives and ongoing stability in these regions will require support from communities themselves, provincial and federal government, as well as a wide range of expertise. Long-term visions or frameworks must insure and guide the invested time and financial resources. These visions must also contribute confidence towards the future sustainability of smaller forestry communities – for the current residents, but also to generate buy-in and support from the rest of the country. Outside of providing economic livelihood, the ongoing sustainability of remote forestry communities in Northern Ontario may ultimately hinge on the quality of place. How can these communities enhance the quality of place to keep residents as well as attract in-migration? How can community and regional identity begin to communicate with distant urban centers? This is a challenge in which architecture and design must offer support. As explored in this thesis, ideas and design involvement are needed on how local forest resources can contribute to self-sufficiency, identity and quality of place. These ideas must rethink current community systems, and generate places that involve the community with innovative approaches and transitions focused on long-term sustainability. **Perhaps the most important role design can offer, as John Thackara described, is an alternative vision of how things could be. Through such visions, the minds of residents, industry and governments become involved in a shared process of envisioning the future of forestry communities.**

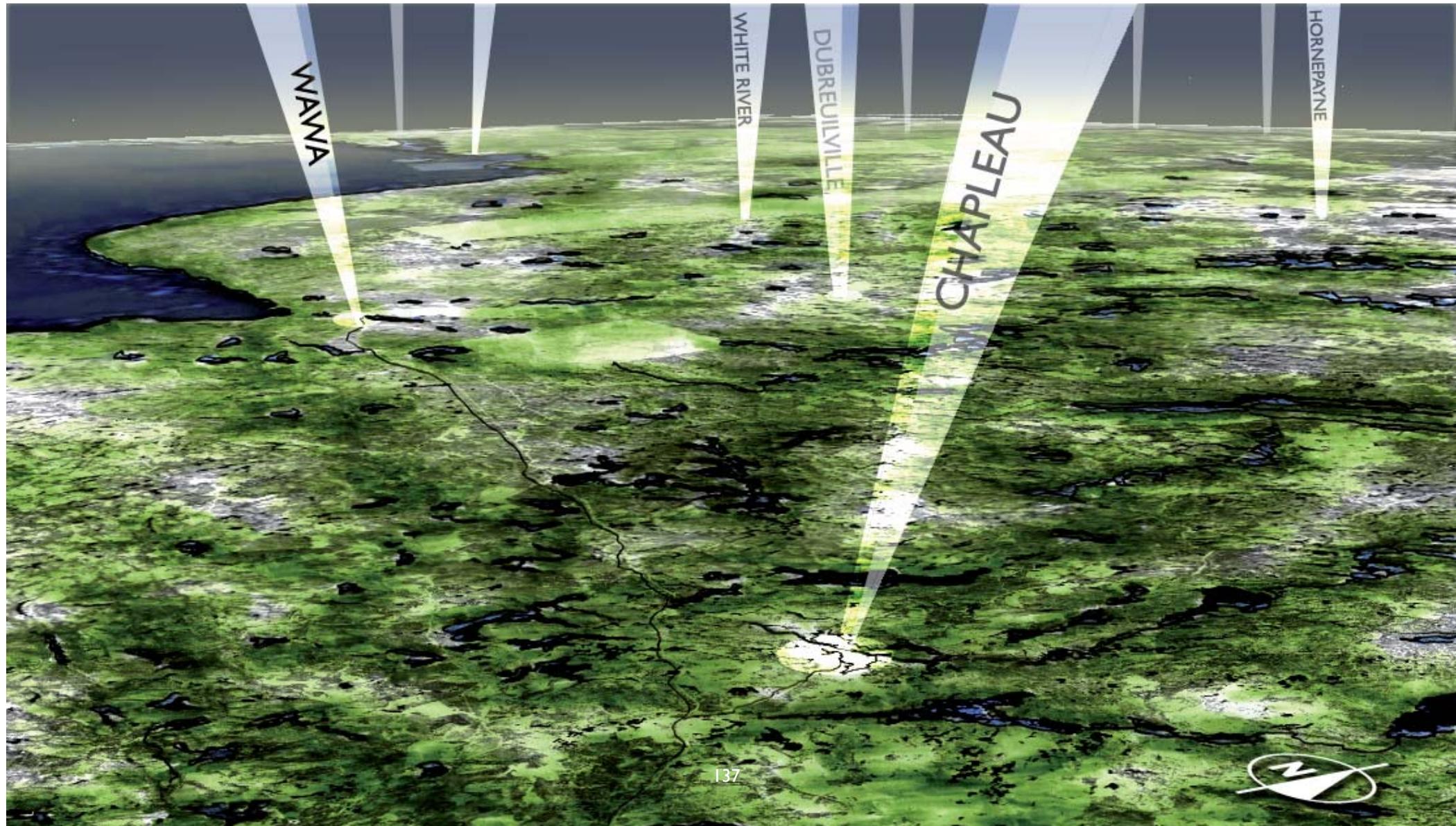
IMPLEMENTATION STRATEGY

An implementation strategy for processes (such as a framework for self-sufficiency) aimed at more effective integration of local forest resources into communities:

- 1) Present this document to local council for comment;
- 2) Adopt principles and related strategies into local and regional implementation tools and policy, such as the economic development, official plans, zoning, building permits, etc.;
- 3) Review and collaborate with community and advisory groups on a local and regional strategic plan;
- 4) Establish and support short-term, achievable projects that involve and empower residents with long-term objectives like self-sufficiency, for example:
 - Import substitution - an ongoing process in which community residents identify products, energy, food or building materials that can be developed or produced locally.¹¹
 - Develop a small business ‘incubator’ - construct/define a shared space to encourage small business development (perhaps focused on import substitution); provide a stable, supportive environment with shared resources having less initial risk.

Fig. 6.2

**REGIONAL AERIAL ENVISIONING A
NETWORK OF SELF-SUFFICIENT COMMUNITIES**



6.2 CONCLUSIONS

Under the current systems, forestry communities in Northern Ontario are likely to continue declining in population, and thus, will continue to struggle to maintain a quality of life. The impacts on the local economy as well as community identity from permanent and temporary industry closures are often irreversible, making it difficult for residents to have confidence in the long-term outlook of their community. In terms of long-term vitality in the region, the precarious state of forestry communities suggests that fundamental systems become more locally reliable and sustainable. At the core of such a transition, the built environment – which shapes the daily life of residents, community identity and quality of place – must adapt to embody principles of self-sufficiency as well as facilitate more effective integration with local ecological resources.

In response to rethinking community systems, as well as a lack of research on the built environment in the region, the thesis question asks ‘what is the role of architecture and design in sustaining forestry communities?’ In Part One, this thesis situates forestry communities and why this thesis question is relevant. A review of literature in chapter one offers a contextual understanding of forestry communities in Northern Ontario; specifically, how communities and urban form originated and evolved, as well as the key challenges, issues and crisis the communities currently face. Here, it is important to focus on uncovering community potential. In literature pertaining to resource-reliant communities most authors highlight longstanding issues (such as resource management or remote location), some authors might call for action, but no one offers long-term visions. Without any comprehensive strategizing at a community level, it seems probable that communities will continue to function within the parameters of outdated systems.

In light of the lack of current analysis on fundamental community systems and the built environment with respect to sustainability, chapter two surveys five townships from the Northeast Superior Forestry Community in order to provide a baseline for gauging appropriate design intervention. Here, a lesson

learned is that first-hand experience is critical to this thesis approach. The consultative process of visiting with the communities, participating in community and regional planning sessions, as well as ongoing discussions with key informants shaped an understanding of the communities not offered by literature. After gaining perspective on the group of townships, chapter three makes a case for sustainable forestry communities in a broader context, citing their intrinsic value to the rest of the country. As figurative caretakers of the vast boreal forests, whose unique town living environments stabilize and diversify the country, the continued existence of forestry communities is critical. Because these values are largely unrecognized (from the perspective of urban centers), this chapter confirms that the thesis question is a necessary one.

In developing response to the thesis question, Part Two of the thesis methodology begins to specifically articulate the role of architecture and design with respect to sustaining forestry communities. The need to rethink the way in which fundamental community systems interact with the local ecological resource-base is discussed in chapter four. This process was informed by townships from the NSFC, by other authors and their ideas on restructuring communities towards sustainability, as well as by experiences and interviews in Sweden. The thesis seeks to combine lessons learned from Scandinavian models with the existing built fabric in forestry communities. It urges Northern Ontario, sharing similar climatic and geographic conditions to northern Sweden, to implement similar systems, focused on localized, renewable and efficient community energy systems that are responsive to the regional conditions, as well as a built environment that reflects locally available materials. Accordingly, the thesis further suggests material and energy-based transitions that ought to improve community self-sufficiency. In addition, design offers valuable visualization: a diagrammed comparison between the existing forestry community system model and a desired system model, which illustrates more effective ecological resource integration. This desired system model provides a fundamental framework from which specific architectural response could emerge.

In chapter five, alongside sustainable principles of the framework, key aspects of a community's built environment are re-envisioned. The strategy is applied to

the township of Chapleau, but the ideas and principles could be applied to other communities. Specifically, the process brought on several design challenges:

- 1) Determining the specific places and institutions in the existing built fabric that could feasibly emerge as transitional places and engage residents.
- 2) Tangibly bridging the gap between a desired, sustainable framework and real places.
- 3) Captivating and widening residents' mindsets (often entrenched in a particular way of life) with visualization that is appropriate, coincides with the uniqueness of place and most importantly, is accessible.

Understanding why a shift from the current systems to a sustainable systems framework is necessary, as well as what the community might potentially look like alongside such principles, are essential views in this transitional time. This is where architecture and design can offer leadership: envisioning the key aspects of the community and its built environment that will contribute to sustainability. Involving key interest groups, such as residents, municipalities, provincial and federal governments as well as industry in the envisioning process, ought to increase the potential to effect fundamental, far-sighted transitions.

Another lesson learned is the pivotal role of residents in smaller communities. As Torbjorn Lahti points out, the success of transitions to sustainability hinge on the involvement of residents. Thus, long-term approaches must empower the community with the ability to decide its own future. It is critical that architecture and design, where possible, support and guide resident involvement:

- By providing initial visions of what could be, as well as long-term objectives;
- By empowering residents to be part of the ongoing process of envisioning their own future;
- By introducing a framework that allows residents to self-organize and develop unique responses (and thus develop a sense of ownership); and,
- By generating places that innovatively bring together local resource integration, community identity and resident interest.

If architectural response can begin to pull these quintessential cultural elements together, then as McMinn and Polo argue, it is regionally responsive. And in these communities (where the built environment is often a mismatch of imported styles and materials) such appropriate, local architectural response has the potential to enhance the quality of place and strengthen the long-term community course.

Equipped with a practical sustainable community framework, as well as innovative responses to regional architecture and daily life, it is possible to envision a network of self-sufficient, confident and desirable forestry communities. With this in mind, one can begin to imagine how the rural and remote communities of this nation might live in the future, and how the country might go about its business of resource extraction without disrupting ecosystems and lives.

APPENDICES

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