TOWARD SUSTAINABLE COMMUNITIES

Revised Edition

RESOURCES FOR CITIZENS AND THEIR GOVERNMENTS

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CHAPTER 2

Toward Sustainable Communities

What is a sustainable community? The concept does not describe just one type of neighborhood, town, city or region. Activities that the environment can sustain and that citizens want and can afford may be quite different from community to community. Rather than being a fixed thing, a sustainable community is continually adjusting to meet the social and economic needs of its residents while preserving the environment's ability to support it (Bridger and Luloff, 2001). Here's how some Minnesota citizens defined sustainable community:

> [A sustainable community is] a community that uses its resources to meet current needs while ensuring that adequate resources are available for future generations. A sustainable community seeks a better quality of life for all its residents while maintaining nature's ability to function over time by minimizing waste, preventing pollution, promoting efficiency and developing local resources to revitalize the local economy. Decision-making in a sustainable community stems from a rich civic life and shared information among community members. A sustainable community resembles a living system in which human, natural and economic elements are interdependent and draw strength from each other (Minnesota SEDEPTF, 1995).

This chapter examines sustainability at the community level. It begins with a look at communities in developed and developing parts of the world, proceeds to investigate some of the reasons why our North American communities are presently unsustainable, explores some characteristics and images of more sustainable communities, and concludes with the role of citizens and their governments in moving us toward sustainable communities.

SUSTAINABLE COMMUNITIES NORTH AND SOUTH

For the first time in history, nearly half of the world's people now live in urban areas — areas characterized by human structures and activities. The way our communities develop will largely determine our success or failure in overcoming environmental challenges and achieving sustainable development. Cities and towns provide enormous, untapped opportunities to solve environmental challenges; they must and can pioneer new approaches to sustainable development and community management. Local governments must also assume the responsibility and marshal the resources to address the sustainability problems facing their communities (ICLEI, 2002).

No one fully understands how, or even if, sustainable development can be achieved; however, there is a growing consensus that it must be accomplished at the local level if it is ever to be achieved on a global basis (ICLEI et al., 1996).

The communities of the developing (southern) world face distinctly different challenges than those faced by the communities of the developed (northern) world. From the perspective of sustainable development, the basic problem with northern cities is that they are unsustainable, whereas the basic problem with southern cities is that they are underdeveloped. Most northern city dwellers are adequately housed and fed, but they meet their needs by consuming at rates the planet cannot afford and polluting at rates the planet cannot tolerate. Many southern city dwellers cannot meet their basic needs for food, clean water, clean air, fuel, transport and an environment free of disease-causing agents. While this dichotomy is not absolute — i.e., there is poverty in most northern cities, and many southern cities live beyond their means in terms of consumption of natural resources such as firewood and water — it helps illuminate the essential challenge of urban sustainability both North and South: meeting basic needs without depleting or degrading natural capital (Devuyst, 2001, Lithgow, *et al.*, 2005).

The cities of the industrial world, with their inadequate urban policies and technology, set the standard to which city managers in low-income countries aspire — low density single family dwellings, cars, expressways, waste creation, air conditioning and profligate water use (Newman and Kenworthy, 1999). The role of the cities of the industrial world deserves much more scrutiny in the context of human settlements and the environmental crisis, precisely because their impact on the world's changing ecosystems is so enormous.

Approaches to accounting for the environment in urban economic development illustrate the differences between traditional environmental economics and a more ecological approach. Traditional environmental economics perceives environmental problems in terms of a deteriorating local environment, e.g., land-fills approaching capacity from the growing waste stream. Solutions are cast in terms of finding efficient trade-offs between economic growth and environmental quality and finding policy instruments that will internalize the costs of pollution to those firms causing the problems. In contrast, the ecological ("strong sustainability") approach reveals new facets of the problem that are invisible to conventional economic policy models. Here attention is on the total relationship between the human population of the urban region, prevailing levels of ecologically significant consumption, and the sustainability of the resource base (Rees, 1992).

THE UNSUSTAINABLE COMMUNITY

It is becoming apparent that almost every issue of sustainable development which emerges at the local level will be replicated, in one form or another, at the provincial, national and international levels (Connell, 1991).

Most North American cities were built using technologies that assumed abundant and cheap energy and land would be available forever. Communities therefore grew inefficiently, and became dependent on lengthy distribution systems. Cheap energy influenced the construction of our spacious homes and buildings, fostered our addiction to the automobile, and increased the separation of our workplaces from our homes. As described by Calthorpe (1989):

> The current round of suburban growth is generating a crisis of many dimensions: mounting traffic congestion, increasingly unaffordable housing, receding open space, and stressful social patterns. The truth is, we are using planning strategies that are [now over fifty] years old and no longer relevant to today's culture. Our household makeup has changed dramatically, the work place and work force have been transformed, real wealth has shrunk, and serious environmental concerns have surfaced. But we are still building World War II suburbs as if families were large and had only one breadwinner, as if jobs were all downtown, as if land and energy were endless, and as if another lane on the freeway would end congestion.

Urban sprawl is one legacy of abundant fossil fuel and our perceived right to unrestricted use of the private car whatever the social costs and externalities. Other local and regional consequences of sprawl, such as congestion, air pollution, jobs-housing location "imbalance," and longer commuting times are now commonly recognized. Yet until recently, few researchers acknowledged that the land use pattern of North American cities also has serious *global* ecological ramifications.

For example, residents of most Canadian cities annually produce about 20 tons of carbon dioxide per capita, placing Canada among the top three or four nations in terms of per capita contribution to potential climate change. In contrast, citizens of Amsterdam produce only 10 tons of carbon dioxide per capita per year. Sprawl, exclusionary zoning, and low density account for much of this difference. If North American cities modeled future development on cities like Amsterdam, future carbon dioxide emissions here would be far less than current gloomy projections now indicate (Beatley, 2000; Newman and Kenworthy, 1999).

One way to consider the impact of a community on natural resources and eco-systems is to consider its "ecological footprint": the land area and the natural capital on which it draws to sustain its population and production structure (Wackernagel and Rees, 1996). Cities and towns demand a high input of resources — water, fossil fuels, land, and all the goods and materials that their populations and enterprises require. The more populous the city and the richer its inhabitants, the larger its ecological footprint is likely to be in terms of its demand on resources and, in general, the larger the area from which these are drawn.

Although some of our cities may appear to be sustainable, analysis of the ecological footprint of industrial cities shows that they appropriate carrying capacity not only from their own rural and resource regions, but also from distant elsewhere — in other words, they "import" sustainability. The flip side of importing sustainability is exporting ecological degradation, or unsustainability, since the production or extraction of natural resources in distant places often causes serious problems of environmental degradation there. Most North American cities (as well as those in Europe, Japan, Australia, and other developed parts of the world) can only have forests, parks, and nature reserves nearby because such land is not being used to meet the demand for food and other natural resources which are instead imported.

The average North American's footprint has grown to measure 4-5 hectares (about 10-12 acres), somewhat more than three city blocks, while the amount of ecologically productive land available has decreased this century from over 5 hectares to less than 1.5 hectares per person in 1994. Ecological footprint analysis shows that the residents of the Lower Fraser Valley (which includes the City of Vancouver, BC), with 1.8 million

During the period that environmentalism became a force in North American public life, our cities and communities have sprawled without consideration for resource efficiency. Infrastructure has been constructed — housing, roadways and sewage systems, for instance — which encourages disregardful resource consumption. Water sources have been taxed or polluted. Built environments have been designed which alter microclimates and promote photochemical smog formation. Environmental services, such as public transit systems, have been left without public support. Our settlements have not only become less and less habitable for humans and most other species. They now stand as the geographic point sources of most regional and global environmental problems, and threaten even the most distant wild areas saved by environmental advocates (Brugmann, 1992).

inhabitants and a population density of 4.5 people per hectare, depend on an area 19 times larger than that contained within its boundaries for food, forestry products, carbon dioxide assimilation, and energy. The country of Holland, with 15 million people, or 4.4 per hectare, requires about 15 times the available land within their own country for food, forest products, and energy use, even though Dutch people consume less on average than North Americans (Wackernagel and Rees, 1996).

Ecological footprint analysis confirms our need to minimize consumption of essential natural capital. If everyone lived like today's North Americans, it would take at least two additional planet Earths to produce the resources, absorb the wastes, and otherwise maintain life-support. Humanity's ecological footprint in 2001 was 2.5 times larger than in 1961, and we are already exceeding Earth's biological carrying capacity by 20 percent. The average footprint per capita on a global basis is 2.2 hectares. North American footprints are double European footprints, and seven times that of the average Asian or African footprint (WWF et al., 2004).

THE SUSTAINABLE COMMUNITY

The postwar pattern of Western urban development is not only ecologically unconscionable but economically inefficient and socially inequitable. In contrast, sustainable development implies that the use of energy and materials be consistent with production by such natural capital processes as photosynthesis and waste assimilation (Rees 1990a,b). To some authors this implies increasing community and regional self-reliance to reduce dependency on imports (California Office of Appropriate Technology 1981; Morris 1982; RAIN, 1981). The benefits would be reduced energy budgets, reduced material consumption, and a smaller, more compact urban pattern interspersed with productive areas to collect energy, grow crops, and recycle wastes (Van der Ryn and Calthorpe, 1986; Sheltair Group, 1998; CitiesPlus, 2003).

Movement toward sustainable communities requires a new kind of ecosystem thinking about human settlements. As described by Brugmann and Hersh (1991):

> In this century, the city has been imagined by sociologists, planners, and engineers as a bazaar, a seat of political chaos, an infernal machine, a circuit, and, more hopefully, as a community, the human creation "par excellence." These different ways of thinking about cities, their social forces, their market behaviours, their reliance on materials and processes from the natural world, both shape and constrain the programmes and policies that local governments put forward to serve the needs of urban people.
>
> The city can also be imagined as an ecosystem. Such a concept provides a tool to understand the complex relations between human activities and the environment, and how communities can organise their activities to both meet human needs and benefit the environment....
>
> Like a natural system such as a pond or forest, an urban ecosystem transforms energy (human labour, capital, fossil fuels) and materials (timber, iron, sand and gravel, information, etc.) into products that are consumed or exported, and into by-products. In natural systems by-products are recycled. We have designed and managed our cities so that these by-products often go unused as wastes. The impact of human activity on the environment can be highlighted by charting the dynamics of the system — the movement of materials and people, the flows of energy and capital, the locations where energy is stored or expended, the rates at which wastes are generated and recycled. By looking at the city as a whole, by analyzing the pathways along which energy and pollution move, we can begin to see how human activities create and direct pollution into local, regional, and global ecosystems. We can also see how these activities can be reorganised and reintegrated with natural processes to increase the efficiency of resource use, the recycling of "wastes" as valuable materials, and the conservation of energy.

Australian researchers Peter Newman and Jeff Kenworthy (1999) note that the most unsustainable form of settlement yet developed — the low density suburb — has been a relatively recent phenomenon, motivated by a strong anti-urban Anglo-Saxon sentiment and facilitated by the automobile. Social organization for ecological sustainability will need to reverse this settlement pattern. Their analysis of settlement patterns and sustainability suggests that sustainable settlements require making cities more urban and making the countryside more rural.

Making cities more urban can be accomplished by "re-urbanizing" city centers and sub-centers; re-orienting transport infrastructure away from the automobile; removing subsidies on the automobile; and providing a more public-oriented urban culture, assisted by attractive urban design (townscapes, streetscapes, malls and squares) and by "traffic calming" measures to facilitate bicycle and pedestrian use of residential areas and major roads. Making the countryside more rural can be accomplished by means such as protecting and encouraging sustainable agriculture and forestry in rural areas and moving towards bioregionalism (e.g., air- and watershed management) as the basis of local government boundaries and responsibilities.

The ideal urban form for a particular locale will depend to some extent on the nature of the energy supply options: for example, higher densities make most efficient use of district heating and public transport networks, while lower densities may make solar energy more viable. The location, gross density and form of new development should therefore be determined in conjunction with programs for energy supply and conservation technologies (Owens, 1990; CitiesPlus, 2003). This principle is illustrated by a San Jose, California study that compared development pressures with or without a "greenbelt" to constrain development. Without it, 13,000 exurban homes would be developed which, compared to an equivalent number of units downtown and along the transit corridor, would require at least an additional 320,000 kilometers (200,000 miles) of auto commuting plus an additional 11 million plus liters (three million gallons) of water *every day*, as well as 40 percent more energy for heating and cooling (Yesney, 1990; City of San José, 2001).

This is not only an "urban" phenomenon. Rural large-lot development, often viewed as an environmentally friendly form of development and supported in plans and bylaws, should properly be classified as rural sprawl. Impacts and costs such as loss of wildlife habitat, resource consumption and storm water contamination associated with urban, suburban and rural sprawl are not equal and can be viewed as a con-

Sustainable urban development is ultimately a cultural statement about ourselves, how we want to live, and our ability to manage our needs, desires, and dreams in ways that are effective and caring. . . . Ultimately the city is the expression of the only ecosystem that we have helped to create; it is the unique contribution of our species, and the creation against which we are most likely to be judged (Jacobs, 1992).

On Natural and Built Environments

We must recognize that the distinction between environment as commonly understood and the built environment is artificial and that the urban [arena] and everything that goes into it is as much part of the solution as it is a contributing factor to ecological difficulties. The tangible recognition that the mass of humanity will be located in living environments designated as urban says that environmental politics must pay as much if not more attention to the qualities of those built environments as it now typically does to a fictitiously separated and imagined 'natural' environment.... A crucial preliminary is to find an adequate language in which to discuss possible futures in a rapidly urbanizing world, a language that actively recognizes that urbanization is both a constituent of, as well as constituted by, the ways such possibilities might potentially be grasped (Harvey, 1996).

tinuum, increasing as lot size increases. Rural sprawl may well be the most damaging and costly form of sprawl (Buchan, 2004).

What this demonstrates is that *the pattern of growth is more important than the amount of growth* in determining the level and efficiency of resource use and traffic congestion. They also show that a critical sustainability objective for our communities is more efficient use of urban space. This objective, as we will see throughout this book, is very compatible with the community capital objectives discussed in Chapter 1, in particular *minimizing consumption of natural capital*, and *multiplying social capital.*

Images of Sustainable Communities

Yaro et al. (1988) developed practical planning standards which rural New England towns can adopt to protect their distinctive character, while at the same time accommodate economic growth. Illustrating actual sites in western Massachusetts, their drawings show each site before development, after conventional development, and after what the authors call "creative development" (Figure 2). In both development schemes, the same number of units have been added. While many aspects differ between the two development approaches, the most critical is that the conventional approach dramatically alters the land-use pattern (e.g., agricultural lands are lost to suburban sprawl),

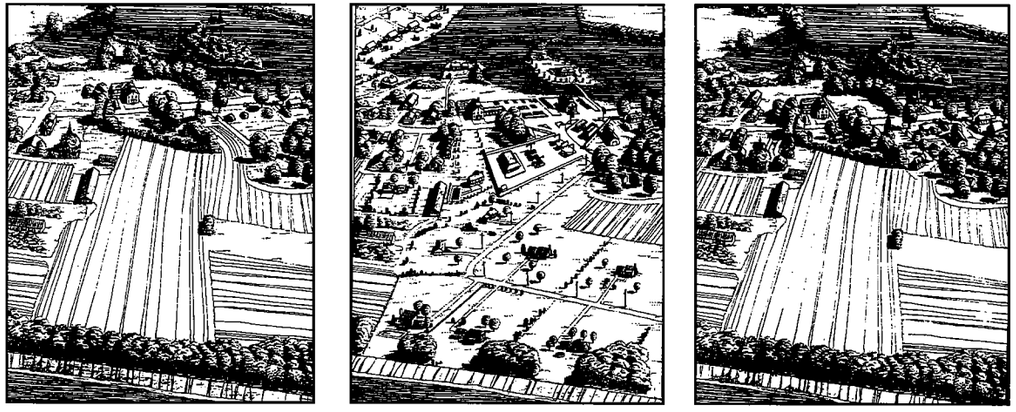

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Figure 2a: Before Development | **Figure 2b: After Conventional Development** | **Figure 2c: After Creative Development**

Before development, after conventional development, and after "creative development." In both development schemes, the same number of units have been added.

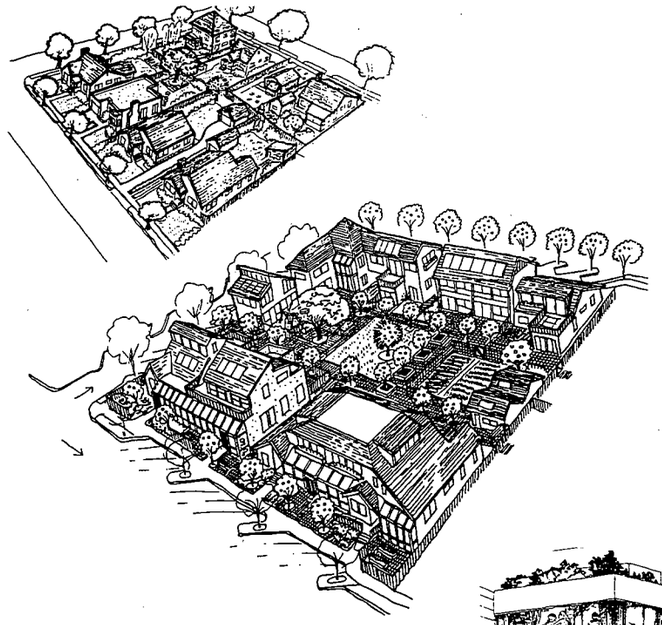

Figure 3: An Urban Cooperative Block
An existing single family neighborhood (above) has been transformed into an urban cooperative block (below) — an urban "village cluster" which could include a community house, common back yards, common parking, and common resources

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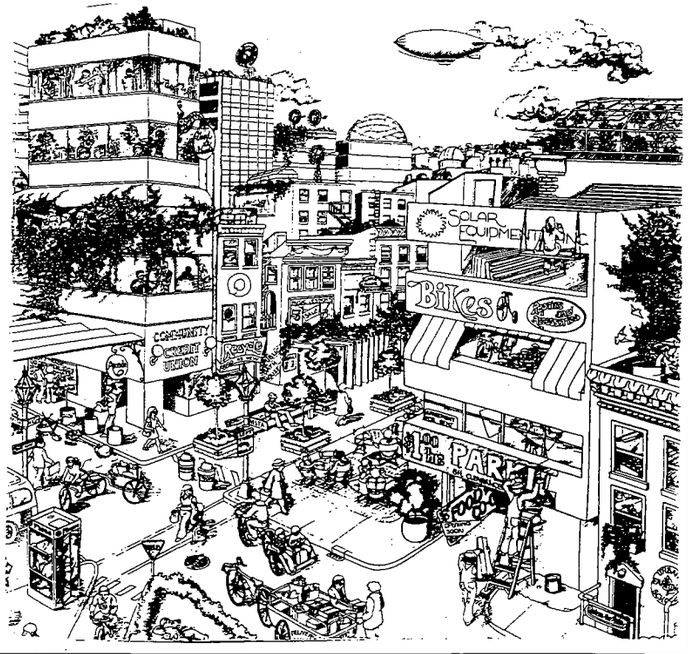
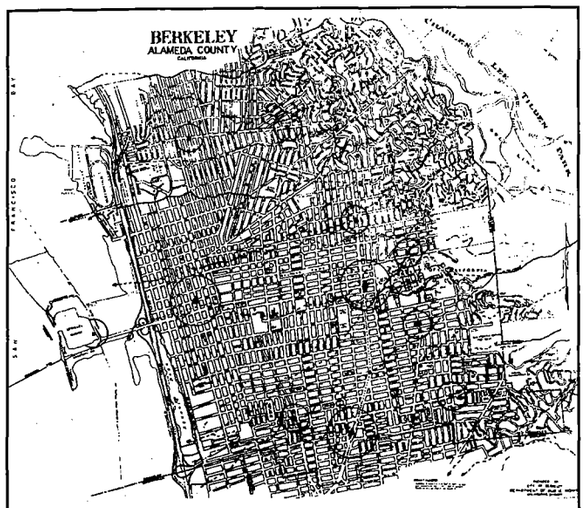
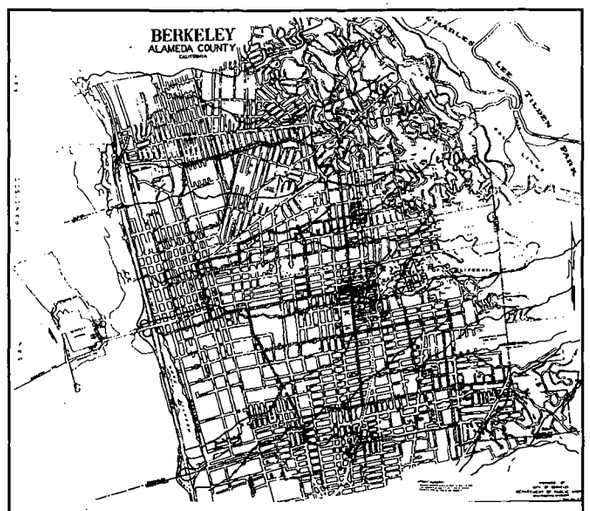


Figure 4: A Sustainable City Vision
This sustainable city vision emphasizes mixed-use zoning, pedestrian-, bicycle- and transit-friendly streets, renewable energy sources, and urban greenery

From a drawing by Diane Schatz, reprinted with permission from *RAIN* Magazine, P.O. Box 30097, Eugene, Oregon, USA 97403; tel: 503/683-1504



Berkeley and its Centers



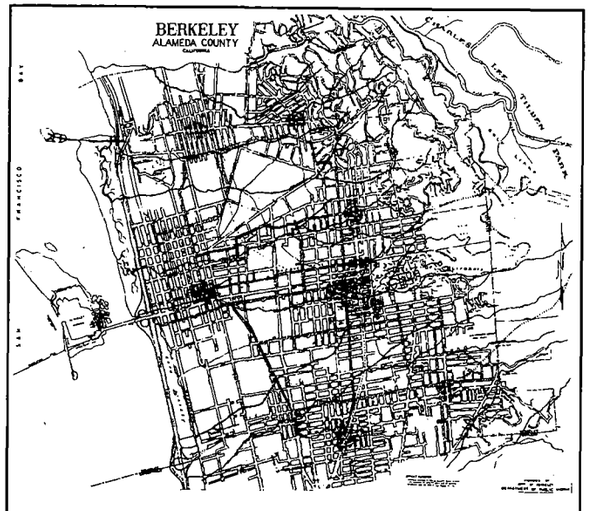
Berkeley, 15 to 50 years hence

Figure 5: A Nodal Vision of Urban Development

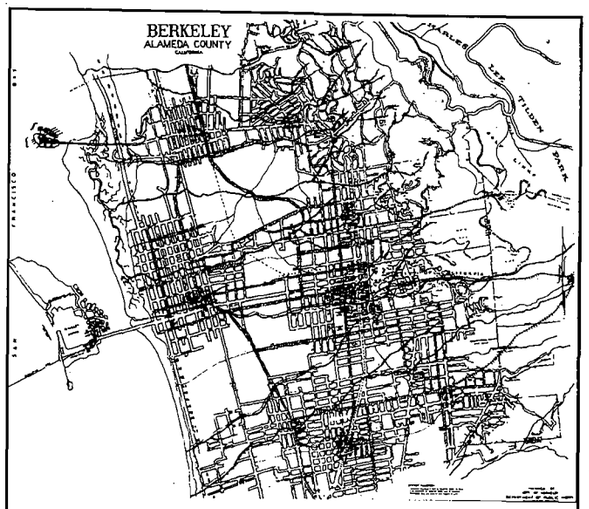
"The underlying concept behind drawing these circles [in Berkeley and its Centers] is simply that distance requires energy and time to traverse. The greater the distance people have to travel, the higher the use of resources and the greater the production of pollution and waste of time. Therefore, we should build relatively compact centers. These areas will then work well with any public transit connecting them to other relatively high-use areas. Within and between the spots of higher activity, people can find it easy and pleasant to walk and bicycle.

while the creative approach absorbs growth without destroying future options (e.g., agricultural "capital" remains intact).

Norwood (1990) illustrates a similar concept, but within the setting of a typical suburban block (see Figure 3). Variations on this theme are increasingly popular in new private-market developments. In this case, an existing single-family neighborhood, characterized by under-utilized backyards, garages, attics, basements, and bedrooms, has been transformed into what the author calls an "urban cooperative block." The urban cooperative block concept could be organized around one or more small or home businesses; it could be designed to "recycle" obsolete corporate/industrial parks, shopping centers, and office complexes; or, as shown here, it could be the center of a "village cluster" typical of the popular Danish cohousing communities, with a community house, common backyards, common parking, and common resources. Many forms of ownership are possible, ranging from a condominium corporation to a nonprofit corporation with resident control, a limited equity cooperative, a community land trust, or a mutual housing association. Potential economic advantages include



Berkeley, 25 to 90 years hence



Berkeley, 40 to 125 years hence

This pattern of 'spots' of development is based on the size of the human body and the speed of walking. It contrasts sharply with 'strip' (one-dimensional or linear development) and 'sprawl' (two-dimensional or flat development) created by and for things that weigh 10-40 times as much and travel up to 50 times as fast: automobiles" (Register, 1987).

lowering housing costs through creating additional units and/or bedrooms, renting rooms and units, and allowing cottage industries or home businesses. By improving affordability, this model has the potential of serving a diversified and intergenerational cross-section of the population.

Figure 4 illustrates a similar concept, but this time the setting is in a downtown core. Many ideas for urban sustainability are illustrated in this drawing, such as mixed-use zoning; streets devoted to walking, cycling, and public transport; heavy reliance on renewable energy sources; rooftop gardens and greenery; and separate "waste" containers for compost and trash. Note the integration of work and home, which reduces the need for travel. As described earlier, a San Jose, California study compared the impacts of 13,000 units of this kind of development downtown and along the transit corridor to an equivalent number of exurban homes. It found that the kind of development pictured here saved at least 320,000 kilometers (200,000 miles) of auto commuting plus an additional 11 million plus liters (three million gallons) of water every day, and required 40 percent less energy for heating and cooling (Yesney, 1990).

Figure 5 brings the discussion to the level of the urban region, using the City of Berkeley, California as an example. Although these maps may at first appear to show the *history* of Berkeley, they actually demonstrate a sustainable *future* development pattern for this urban region. The first map in this set shows Berkeley and its town and neighborhood "centers." These centers were selected as a compromise between the "ideal" centers — according to the natural features of the landscape such as ridge lines and steep slopes — and the existing centers. Over time, urban development is concentrated near these centers while surrounded by non-urban lands. Once again, the key feature is the *pattern* of urban growth.

These drawings demonstrate a "nodal" rather than a "centralized" vision — a network of smaller, compact communities surrounded by non-urban land. As the city grows, and its centers become increasingly compact, the surrounding land can be reclaimed — as open space, forests, agricultural land, and wildlife habitat — to simultaneously benefit people and the environment.

MOBILIZING CITIZENS AND THEIR GOVERNMENTS

There is no (and perhaps should not be any) single accepted definition of sustainable communities. Communities must be involved in defining sustainability from a local perspective. The dilemma is how to encourage democracy (e.g., participatory local processes) within a framework of sustainability. As we have seen, elements of this framework include minimizing consumption of essential natural capital and improving physical capital, which in turn require the more efficient use of urban space. This sustainability framework also includes strengthening economic capital, increasing human capital, multiplying social capital, and enhancing cultural capital. However, an additional element is necessary to coordinate, balance and catalyse the others.

There are legitimate causes for concern about the dislocations, economic costs, and potential inconveniences associated with sustainability measures and their distribution across society. Both the gain and the pain of adjustment should be shared fairly by community members. Participation in the decision process by affected groups "can help make the attendant redistribution of costs and benefits fairer and more widely understood. Democratic mobilization is essential to the achievement of such policies in the face of the opposition [by vested interests they] inevitably engender" (Paehlke and Torgerson, 1990).

Environmental organizations and activists, especially in the United States and Canada, have tended to focus narrowly on specific campaigns of one kind or another, and may find it difficult to see how their work fits into the larger social, political and economic context. Yet the current popularity of the term sustainable development requires those concerned with environmental protection to cooperate with others in meshing environmental critiques, goals and strategies with those of peace, social justice, equality and economy, etc. (Gibson, 1991; PCSD, 1996).

In general, sustainable development strategies should favor bottom-up over top-down approaches; redistribution over "trickle-down;" self-reliance over dependency; a local rather than a regional, national, or international focus; and small-scale projects

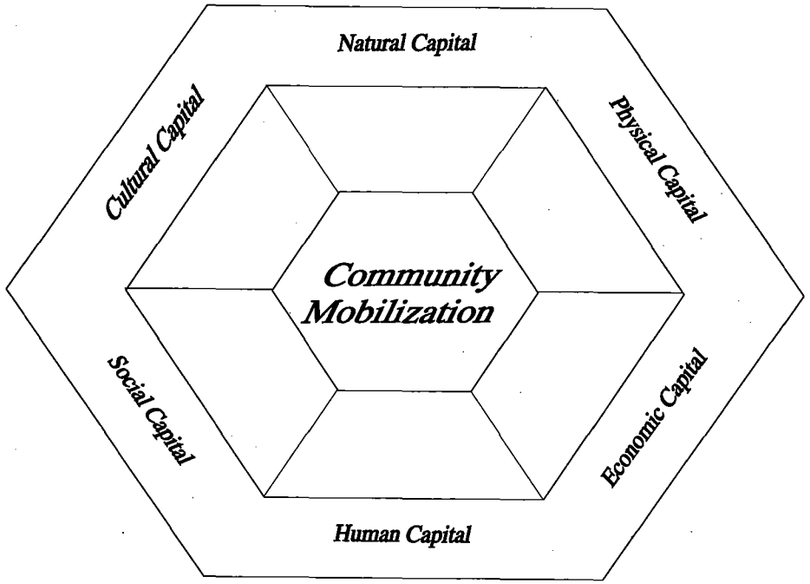


Figure 6: A Framework for Sustainable Community Development. Sustainable development requires mobilizing citizens and their governments to strengthen all forms of community capital. Community mobilization is necessary to coordinate, balance and catalyse community capital.

rather than grand-scale or megaprojects. As well, they should be designed with extensive public participation; seek to improve society and the environment as well as the economy; and result in increased equity, equality and empowerment (Brohman, 1996).

Democracy is an inherent part of the sustainable development process. Sustainable development must be participatory development. Real visions for change rarely come from government or from the marketplace, but from civil society (Newman and Kenworthy, 1999). For people to prosper anywhere they must participate as competent citizens in the decisions and processes that affect their lives (Gran, 1987). Sustainable development is thus about the quantity and quality of empowerment and participation of people. Sustainable development therefore requires community mobilization, i.e., mobilizing citizens and their governments toward sustainable communities.

In summary, applying the concept of sustainable development to North American communities requires mobilizing citizens and their governments to strengthen all forms of community capital. Elements of this framework include minimizing consumption of essential natural capital and improving physical capital, which in turn require the more efficient use of urban space. This sustainability framework also

includes strengthening economic capital, increasing human capital, multiplying social capital, and enhancing cultural capital. Community mobilization is necessary to coordinate, balance and catalyse community capital (Figure 6). The significance of these criteria for the future of our communities and our society is elaborated in the following chapters.

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