

Chapter 2

Evolution Towards an Ecosystem Approach to Public Health

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2.1 Introduction

This chapter discusses the key milestones leading to the emergence of ecosystem approaches to public health thinking, research and practice. The chapter discusses events in three areas that led to public health thinking toward an ecosystem approach. First, the chapter traces evolution of thinking in public health from the “old” public health, through to the “new” public health, and on to “critical” new public health. The “old” public health is characterized by three phases: the sanitary phase (1840s–1870s), the preventive phase (1870s–1930s), and the therapeutic phase (1930s–1970s). All three phases are associated with the biomedical model of health, with each era defined according to dominant forms of medical knowledge (Brown and Duncan 2002). With growing criticism of the individualistic focus of the biomedical model of health and its failure to respond to the complex and structural determinants of poor health, a “new” public health emerged in the mid-1970s. The focus of this “new” public health was to shift the focus from the individual to a multi-causal, socio-ecological approach to health, taking into account the interaction of social, environmental, psychosocial and other factors in producing ill health. With the emergence of the postmodern era and critical theory, the production and circulation of scientific knowledge claims came under scrutiny. Critical scholars

began to challenge the objectivity of scientific knowledge claims, instead seeking to illustrate how such claims could be shaped by socio-political, cultural and historical contexts. Critical scholars see the production of scientific knowledge claims to be closely linked with the exercise of power, and interrogates the assumptions and practices of the new public health movement. In particular, critical scholars compare the principles underlying certain health promotion practices to new forms of governance, regulation and social control (Lupton 1995).

Secondly, within the natural resources management sector, there were growing concerns about the discrete, isolated approaches to managing the social, environmental, and economic components of natural resources, with more emphasis placed on the economic component to the detriment of the other two (Hancock 1990). Instead, an integrated approach that gave equal importance to all three components was recommended, giving rise to an ecosystem approach to natural resource management.

Thirdly, increasing calls for sustainable development and the preservation of the environment complemented events in both the public health and natural resource management sectors. Global initiatives such as the Brundtland Commission, the United Nations Commission on Environment and Development, the Johannesburg Summit on Sustainable Development and the 2010 Summit on Climate Change in Copenhagen, all buttress the need for holistic approaches to promoting sustainable human development, which incorporates both social and environmental dimensions. Together, these efforts are intended to respond to health, environment and sustainable development concerns in a concerted manner, and to simultaneously promote human health and ecosystem health.

2.2 “Old” Public Health and the Biomedical Approach

Ecological approaches to public health research and practice date back to the early nineteenth century with the emergence of the sanitary paradigm in Europe. Occurring between the 1840s and 1870s, diseases, especially those in the urban slums of European cities, were attributed to contaminated environments. The external environment was considered a filthy place, filled with dirt, pestilence, and contaminated water, soil and air. This polluted environment was thought to be responsible for major disease epidemics, although there was no scientific evidence to back this claim (Pedersen 1996). The primary focus of public health at the time, then was to monitor the transfer of dangerous substances from the physical environment, including air, water, and food, into the human body, and those being excreted from the human body, including urine, faeces, sputum, and semen into the environment. The control of diseases focused on environmental remediation and involved proper garbage disposal, closed drainage and sewage systems, and the adoption of hygienic practices and behaviour (Dubos 1968). The control of diseases was also broadened to include addressing poverty and broader social problems, after Edwin Chadwick and Engels, two pioneers of the sanitary paradigm, argued that poverty

and environmental diseases are intricately linked, and effective interventions must be broadened beyond environmental remedies to include broader societal factors (Susser 1987). The sanitary paradigm paved the way for the introduction of fields like hygiene, public works and sanitary engineering.

In the late nineteenth century, this understanding that environmental and broader societal factors were responsible for the causes of diseases was soon superseded by the emergence of the germ theory and the discovery of microbes. This era dominated medical and public health sciences until the mid-twentieth century (1870s–1930s). The germ theory was characterized by ground-breaking work by pioneers like Robert Koch, who demonstrated in 1882, that a mycobacterium (tuberculosis bacilli) was the causal agent responsible for tuberculosis (1912); John Snow’s work on cholera, and Louis Pasteur work that demonstrated that a living organism was the agent in an epidemic afflicting silkworms (Susser and Susser 1996). The germ theory postulated that specific micro-organisms were responsible for the causation of specific diseases. Both the environment and the human body were contaminated by invisible micro-organisms that resulted in infectious and parasitic diseases. The germ theory was dominated by cause-effect linkages between microbes and epidemics, and it was believed that the exposure of individuals to certain microbes in a contaminated environment resulted in specific diseases (Pedersen 1996). The focus on specific agents led to an overly reductionist model of disease causation and a narrow laboratory perspective of identifying and experimentally transmitting disease-causing microorganisms (Evans 1976).

At the time, appropriate interventions for the control of infectious diseases included immunizations, personal hygiene and health education. Anti-microbial agents, DDT and other pharmacologically active substances were used to fight micro-organisms and disease vectors such as mosquitoes. With the discovery of antibiotics in the 1940s, coupled with advances in microbiology and laboratory-based science and diagnosis, many were convinced that the fight against infectious and communicable diseases and other global epidemics was over. This was complemented nicely by a reduction in communicable diseases in most developed countries, with infectious diseases such as typhoid, diphtheria and tuberculosis reducing in numbers (Susser and Susser 1996). This optimism was so high that following World War II, some world leaders and international organizations declared the eradication of malaria from the planet (Garret 1994). The germ theory era made way for molecular medicine, as soon as, viruses and genes were detected.

The victory over infectious diseases was short-lived by the emergence of chronic diseases in the western world. Following World War II, diseases such as peptic ulcer, lung cancer and coronary and heart disease afflicted many middle-aged men in the western world (Susser and Susser 1996). The origin of these diseases were unknown and public health researchers and epidemiologists made use of a variety of techniques to determine possible factors that enhanced risks (Morris 1957). These methods of investigation were depicted by the “black box” paradigm, which mostly related exposure to outcome with minimal analysis of possible intervening factors or pathogenesis (*ibid*).

Studies in illustrated the early 1970s the association between certain lifestyles such as sedentarism, alcoholism, and smoking with non-communicable diseases. A longitudinally study in the mid 1980s confirmed the links between certain ways of living and behaviour, with morbidity experience and life expectancy (Berkman and Breslow 1983). In addition, the emergence of HIV/AIDS in the 1980s further increased the focus on personal behaviour as an important determinant of health. The dominant ideology then was that disease and ill health were products of individual lifestyle choices, and the individual was blamed for engaging in certain health deteriorating behaviours and practices. Health thus became a personal responsibility, and public health analysis focused on individual factors, accompanied by individual level interventions such as behaviour modifications, exercise, and diet regimes. Both health and disease were abstracted from the biophysical environment and the broader social context, while health education was instituted to exhort individuals to engage in appropriate health behaviours.

The biomedical model characterized the above eras of public health, with emphasis being placed on therapy, treatment of infectious diseases, cause-effect mechanisms, and behaviour and lifestyle modifications. This approach to health care was complemented with capital-intensive health care facilities and services, and high health care costs. By the mid to late 1970s, many countries, especially those in the developing world, to experience difficulty with rising healthcare costs, and the ability to continue to sustain high-technology medical care (Davies and Kelly 1993). In addition, the costly and capital-intensive health care strategies were unable to respond to the health needs of many developing country nationals (Doyal 1979; George 1976). Besides, in those regions, there seemed to be growing appreciation of the potential of grassroots efforts to respond to health concerns through community participation and self-reliance strategies, as demonstrated by success stories in places like China and Cuba as well as those about Tanzania's barefoot doctors (Matomora 1986; Navarro 1972; Sidel and Sidel 1973).

During this period, academics and international health professionals began to express concerns about the failure of the dominant biomedical paradigm to address growing health disparities between regions and population groups, as well as effectively respond to the growing complexities of the health problems facing society. Critics argued that the undue emphasis of the biomedical approach on the individual blames the victim, and fails to take into account the social context in which health decisions and actions occur (Minkler 1994; Neubauer and Pratt 1981). Also, there was increasing understanding that many of the underlying causes of poor health stem from factors such as poverty, unequal world order, globalization and regional marginalization. The vulnerable in society, the poor, rural residents and those at the bottom of the socioeconomic ladder continue to bear a disproportionate portion of the burden of disease (Schulz et al. 2002). The onus on individuals to modify their own health practices needs to be examined in light of unequal power relations that constrain access to health enhancing resources and decision-making processes. Social, economic, and cultural constraints, as well as, limited financial resources, time, education, information, social networks, poor housing and toxic neighbourhoods all undermine peoples effort to live healthy lifestyles.

While criticism of the biomedical model increased, other scholars, such as McKeown argued that the reduction in death rates in the western world over the past two centuries was largely due to improvements in the physical environment, such as: increase in food supplies, changes in social and economic conditions, smaller family sizes, preventive measures, and the control of infectious diseases, and not due to advanced medical care and technology alone (McKeown 1971, 1976). McKeown’s argument then was that major improvements in health in the nineteenth century were not due primarily to medical interventions and therapeutic efficacy, as was now being espoused, but also due to improvements in the social and environmental determinants of health. McKeown’s ideas and analysis were incorporated in a Canadian federal publication called the Lalonde Report, or *A New Perspective on the Health of Canadians* (Lalonde 1974). Also complementing this was the increasing realization that emerging public health challenges such as HIV/AIDS were becoming too complex to be understood and adequately intervened upon from uni-dimensional perspectives. The social and ecological model that was dismissed in the nineteenth century had to be reconciled with once again. Public health researchers began to shift their focus to a multi-causal paradigm that saw diseases, be they infectious, chronic or degenerative, as being the result of a complex interaction among a number of factors, including social, biophysical and psychosocial factors (Brown and Duncan 2002). This shift in thinking, together with the Lalonde report (1974) and other international public health initiatives, such as the Alma-Atta Declaration and the Ottawa Charter for Health Promotion, paved the way for new thinking in public health, dubbed the “new” public health.

2.3 The “New” Public Health and Ecological Approaches

As discussed above, one key report that was instrumental in shaping the thinking around the new public health, both in Canada and internationally, was the Lalonde Report. The report suggested that four key factors were instrumental in shaping human health. These included: human biology, social and physical environments, lifestyle, and the organization of healthcare. *Human biology* refers to an individual’s genetic baggage that predisposes them to specific diseases; *environment*, broadly used, refers to all the factors external to the human body that can influence health and are completely or partially beyond the individual’s control; *lifestyle* refers to the choices that individuals make that influence their health, such as smoking, exercise, consuming excessive amounts of alcohol, nutrition, among others; and finally *health care organization* refers to the quality of services that are accessible or available to individuals or communities through local institutions and other regulatory structures (Lalonde 1974). The Lalonde Report was one of the first documents to emphasize the important role of environmental factors in shaping human health, and a call to broaden the scope of improving public health beyond the traditional biomedical model. The report also emphasized the role of individual behaviours in shaping health outcomes, and recommended that human health can be improved by focusing

on environmental actions and the adoption of health-enhancing lifestyles. However, as it turns out, the latter was more in tune with the existing biomedical model, and emphasis was placed on lifestyle modification to the detriment of environmental actions. Hence individual actions such as behaviour modification, exercise, nutrition, and individual habits, were accorded more importance over community-based and environmental approaches to health improvement (Lupton 1994; Minkler 1994; Neubauer and Pratt 1981).

Emulating the Lalonde Report, the United States Department of Health, Education and Welfare, published the first Surgeon General Report on Health Promotion and Disease Prevention, *Healthy People* (United States Surgeon General Report 1979). The report discussed the role of both individual behaviours and environmental factors in influencing health. The report drew attention to the “careless habits” of society, poor social conditions, and the continuous pollution of the environment. Just like the Lalonde report, the emphasis seemed to be placed on the “careless habits” and the role of the individual, while ignoring the broader environmental factors (Neubauer and Pratt 1981).

In 1986, the Ottawa Charter for Health Promotion (WHO 1986) was released, and the Charter expressed a new view of health and re-iterated the importance of incorporating ecological factors in health promotion strategies. The Charter acknowledged that ecology, caring, and holism were essential issues in developing strategies for health promotion. The Charter emphasized the interrelations among health improvement, stable ecosystems, the sustainable use of natural resources, and the protection of the environment. It encouraged the conservation of natural resources throughout the world as a global responsibility, and emphasized incorporating the protection of both the natural and built environments into health promotion strategies (WHO 1986). The concept of community involvement, and equal participation by men and women in health promotion strategies were also endorsed in the Charter. The Charter proposed five action areas, including building healthy public policies, creating supportive environments, strengthening community action, developing personal skills, and reorienting health services. According to Kickbusch (1989), the Ottawa Charter for health promotion was the first document to delineate an agenda for the *new public health* by locating within the context of new ecological thinking.

The objective of this new public health has been to re-orient public health from an individualistic focus to a more social and ecological approach; integrating social, environmental, cultural, and community aspects of health (Green et al. 1996; McLeroy et al. 1988, 1992; Stokols 1992). This new public health emphasizes prevention, rather than curative interventions. It is also concerned with the reduction of health disparities among various social groups, the production of healthy living and working environments, and the promotion of community participation and individual empowerment (Brown and Duncan 2002). Health from this new perspective is no longer the absence of disease, but seen as a resource for everyday life (Green 1984). This paradigm shift is closely linked to calls for the use of more community-based participatory research approaches that involve participants in all phases of the research process, so as to raise community consciousness, while empowering people to respond to their own health concerns in a proactive

manner (Laverack and Labonte 2000; Robertson and Minkler 1994; Schwab and Syme 1997). It also reflects ideas expressed in earlier international health initiatives such as the Alma-Ata Declaration on Primary Health Care (WHO 1978). For example, the Alma-Ata Declaration encourages balancing medical approaches to health care with greater emphasis on the social, political and environmental determinants of health, especially for vulnerable and disadvantaged populations. The Declaration also identifies adequate nutrition, safe water, and basic sanitation as part of a number of essential elements for health improvement. In addition, the Declaration gave formal recognition to the role of community participation in health and encouraged a shift away from health-sector to multi-sector or inter-sectoral approaches to health intervention.

Following the release of the Ottawa Charter, subsequent initiatives expressed similar ecological sentiments to health promotion. Among these are: the “Health for All by the Year 2000” strategy, Healthy Public Policy Conference in Adelaide, Call for Action: Health Promotion in Developing Countries, the Healthy Cities Project Initiatives, and the Sundsvall Statements on Supportive Environments. For example, the Healthy Cities Project Initiative emphasizes the intricate connections between human health and the quality of the environment in which people live (Green et al. 1996). Cities seeking to become healthy are encouraged to engage in intersectoral planning and decision-making processes to identify healthy choices for their communities (Flynn 1996). Throughout Canada, a number of cities have designated themselves as “healthy communities,” emphasizing active community participation, intersectoral collaboration, and mutual dependence between the individual and the broader society (Minkler 1999). Also, in 1991, the third international conference on Health Promotion, held in Sundsvall, Sweden, stressed the intricate linkages among health, environment, and human development, and emphasized how development activities must strive to improve both quality of life and health, while preserving the sustainability of the environment (Sundsvall Conference 1991). Recent initiatives such as, the United Nations Millennium Development Goals, 2002 Summit on Sustainable Development in Johannesburg, and the Johannesburg Water, Energy, Health, Agriculture, and Biodiversity (WEHAB) Framework, Millennium Ecosystem Assessment, and the 2010 Climate Change Summit in Copenhagen have all drawn attention the linkages between environment and human health, and the need for broader ecological approaches that span beyond the health sector. At the continental level, there have been on-going regional meetings between environment and health ministers in Africa, Europe, and Latin America. Together these initiatives have paved the way for modeling and thinking about public health from an holistic, ecological and integrated perspective.

2.4 Integrated Approaches to Natural Resource Management

While the health sector sought to develop an inclusive and ecological approach to improving health, there were growing concerns about role of human activities in causing environmental degradation, resource depletion, and climate change. There

was also growing disillusionment with the conventional approach to natural resource management that discretely managed resources to satisfy isolated community, economic and environmental objectives, without taking into consideration how such objectives are intertwined and as such should be accorded equal importance. In a schematic developed by Hancock (1990), the conventional approach to natural resource management focuses excessively on managing natural resources to satisfy economic goals, to the detriment of the social and ecological goals (ibid). Such an approach fails to see human beings as integral to the ecosystem. It also fails to recognize that the overall sustainability of an ecosystem resides in balancing the social, economic and environmental aspirations.

One area where the concern for the adoption of an integrated approach to natural resource management first surfaced was in the Great Lakes Basin shared by Canada and the United States. Following World War II, it was falsely assumed that, by the sheer vastness of the Great Lakes Basins, it would be able to assimilate toxic substances, and as such became the dumping ground for toxic effluents (Great Lakes Research Advisory Board 1978). However, following a study it was observed that the aquatic ecosystem together with its fauna and flora had become extensively degraded (Colborn 1996). This realization led to the establishment of the International Joint Commission by both the United States and Canadian governments with the mandate to examine how to best manage the watershed in ways that would allow the continuous use of its resources for both social and economic purposes while preserving the integrity and sustainability of the biophysical characteristics of Great Lakes Basin (Great Lakes Research Advisory Board 1978; International Joint Commission 1991). In response, the International Joint Commission (IJC) proposed an “ecosystem approach” to watershed management. The ecosystem approach seeks an integrated approach to natural resource management that takes into account all the key elements of a particular ecosystem, including air, water, land, fauna and flora, and also the human inhabitants. The approach takes into account the intricate linkages between the biophysical ecosystem, economic activity, and human health concerns, and seeks to balance these so as to achieve sustainable development (Rapport 1995). Rather than manage these issues in isolation, the ecosystems approach makes use of a systems perspective, which views human needs, economic, and ecological goals as intricately bound and needs to be addressed as an integrated whole. The ecosystem approach situates human beings at the core of the ecosystem, sees human health as integral to healthy ecosystems, and so ensures ecosystem management contributes positively to the health of both ecosystems and human beings (Forget and Lebel 2001). The Great Lakes scientists were among the first scientific group in North America to propose an ecosystem approach to resource management (International Joint Commission 1991).

Since its application, the ecosystem approach has been endorsed and adapted by a variety of groups, including the Canadian Council of Ministers of the Environment, the Convention on Biological Diversity, and the Millennium Ecosystem Assessment. The Canadian Council of Ministers of the Environment (CCME 1994) describes the ecosystem approach as:

viewing the basic components (air, land, water, and biota – including humans) and functions of ecosystems in a broad context, integrating environment, social, and economic concerns (p. 3).

The Convention on Biological Diversity defines the ecosystem approach as follows:

The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. . . . the application of the ecosystem approach will help to reach a balance of the three objectives of the Convention: conservation; sustainable use; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of many ecosystems.

Given the varying needs and competing interests of stakeholders and the complexity of ecosystem structure and function, the application of an ecosystem approach requires the integration of a variety of perspectives. It is important to integrate expertise from a variety of disciplines including, economics, medicine, anthropology, sociology, veterinary sciences, and ecology (Rapport 1995; Rapport et al. 1999), as well as, lay perspectives and local knowledge from inhabitants and resource users. By integrating across the natural, social, and health sciences, the ecosystem approach transcends disciplinary boundaries and brings together the unique views and knowledges of the various disciplines, and allows for a nuanced understanding of the complexities surrounding ecosystem use and management (Rapport 1995; Rapport et al. 1999).

2.5 Making the Links with Sustainable Development

Alongside the ecosystem approach to natural resource management, there have been increasing efforts to make explicit the links among health, environment, and sustainable development. For example, in 1987 the World Commission on Environment and Development introduced the concept of sustainable development in a report entitled *Our Common Future* (Brundtland 1987). The Commission defined sustainable development as:

a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both the current and future potential to meet human needs and aspirations.

Although the report did not single out human health as one of the key areas of focus, it identified society's role in changing the environment, and how these environmental changes, in turn, affected human health. The Chair of the Commission, former Prime Minister of Norway, Mrs. Gro Harlem Brundtland, later explained that it was not important to single out human health as an area of emphasis, when the entire report was about health (WHO 1998). In essence, the commission saw health

to be a central goal of human development, and the protection of the environment and the improvement of human health must be addressed conjointly.

Following on this path, in 1992 the United Nations Commission on Environment and Development (UNCED 1992), held an Earth Summit in Rio de Janeiro which drew further attention to the global deterioration and depletion of the world's ecological resources and the potential implications for human health. The report drew attention to how so-called development programs, underdevelopment, and poor development practices, could deteriorate the environment and negatively impact human health. The human dimension of sustainable development was emphasized through the first principle of the Rio Declaration, which stated that "...human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature." Agenda 21, the action plan for UNCED, took this further by stressing that the health needs of the world's population need to be addressed urgently through strategies that would acknowledge the interconnections among all dimensions of the environment, development and human health. For the first time, the need for a concerted, transdisciplinary approach to improving human health in the context of environmental sustainability was recommended. Health was no longer an issue for only the medical community, but also for professionals within agriculture, housing, public works, sanitation, and natural resource management.

Following the Earth Summit, the World Health Assembly in 1992 formulated a new WHO Global Strategy for Environmental Health, partially taking into account the recommendations and new thinking around health from the Earth Summit (WHO 1998). The Strategy articulated this new thinking as follows:

- (1) Health is a an essential component of sustainable development which can only be achieved through concerted action by all sectors of society;
- (2) action in the physical and social environments to improve health is taken in close partnership between the health sector and those other sectors, which have a strong impact on environmental quality;
- (3) health is also affected by the actions of individuals, families, community groups that have an enormous impact on their environments

Recent reports such as the Health Synthesis of the Millennium Ecosystem Assessment (2005) also draw attention to the links between ecosystems and human health.

2.6 Modeling Human Health from an Ecosystem Perspective

Recent events in both the public health and natural resources sectors, together with global initiatives on sustainable development have rekindled interests in modeling human health from an ecosystem perspective (Van Leeuwen et al. 1999). Modeling human health from an ecosystem perspective places human beings squarely at the

centre of ecosystem management, suggesting that human beings, either individually or collectively, influence and are influenced by the surrounding biophysical, social, and economic environments, and the existing policies governing such environments (ibid). Van Leeuwen and colleagues (1999) reviewed a number of ecosystem models of human health from the late nineteenth century to the 1990s, and eventually proposed a “butterfly model of health”, which took into account key features and attributes of past models. The butterfly model reflects the complex ways in which key elements of the biophysical and socio-economic environments of humans interact within an ecosystem context. The authors demonstrate how the model can be applied to human populations assembled according to political boundaries (e.g. communities, provinces) or ecological boundaries (watersheds, farmlands).

The concept of an ecosystem serves as a useful construct for illustrating the complexities and interactions of the myriad factors influencing health from varied temporal and spatial dimensions. Ecosystems exist in multiple spatial and temporal dimensions, and are usually thought of as being organized in nested hierarchies, with each level of the hierarchy demonstrating inherent properties that occur as a result of the complex interactions of the many internal and external components and functions of the ecosystem (Van Leeuwen et al. 1999).

Ecological approaches to health tend to seek a balance among individual level factors and broader social and ecological factors. Hence modeling human health from an ecosystem perspective makes use of systems thinking that recognize human health as influenced and conditioned by factors at various levels and scales including those related to the individual, family, community, surrounding biophysical and socio-economic environments, and national and global policies. This nested nature of health determinants calls for an examination of how factors at these various levels interact and influence health outcomes, and helps identify appropriate levels and targets for intervention. This ecosystem approach to health recognizes that the complexity and multiplicity of factors influencing human health cannot be adequately resolved through uni-dimensional or piece meal approach. Instead, health must be promoted from an holistic and integrated perspective. Ecological approaches try to illustrate the reciprocal nature of the relationships between people and their environments, and place emphasis on the fact that improved health is achieved through concerted efforts between the intrapersonal level and broader community, institutional, and policy factors (Bronfenbrenner 1990).

One of the earliest ecological models of health to depict this thinking, is the “Mandala of Health” (Hancock and Perkins 1985). A *mandala* represents a circular design of concentric rings incorporating multiple factors ranging from the biological and personal to the biosphere. Individual health is situated in the centre, and is comprised of the mind, body and spirit. This initial ring is then influenced by circular nested systems of the household, the community, the human-made environment, culture, and the biosphere. These nested rings are considered to be intimately interdependent and jointly influenced by other social and political forces. They are also dynamic in size and shape, depending on the temporal and spatial contexts (Van Leeuwen et al. 1999). In addition, there are a number of factors that have to be taken into account when analyzing how individual health is shaped by all

these nested rings including: individual developmental histories and social support systems; community-mediating structures, such as community networks and power structures; access to, and control of community and ecosystem resources; organizational structures and processes that can negatively influence health; participation in decision making processes; advocacy, and content of public policies (Minkler and Wallerstein 2003).

There have also been health models from the perspective of a community ecosystem. For example, Hancock (1990) proposed a community ecosystem model of health which integrates the concepts of health and sustainable development in the context of the community. This model complements the Mandala of Health model and is suitable for communities striving to become both healthy and sustainable. The community ecosystem model is comprised of three overlapping circles: community aspirations, the economy, and the environment. Centrally located in the middle of the three overlapping circles is “health or human development.” Hancock suggests that for human health development to be optimized, three qualities must be met in each for the three circles: community, economy, and environment. For example, within the community, it is important that the community be convivial; that is have social support networks, provide opportunities for community members to live together in harmony and be able to participate fully in decision-making processes. Also, the built environment of the community must be liveable; that is possesses an urban structure that supports conviviality and also provides a viable human environment. Lastly, the community must be equitable, ensuring that its members are treated fairly, that people are able to meet their basic necessities, and have equal opportunities to reach their optimal potential.

With respect to the economy, the main requirement is that the economy is adequate and able to generate sufficient wealth to enable community members obtain a satisfactory level of health. Economic wealth must be equitably distributed within the community, and the economy must be environmentally sustainable.

For the environment, the primary requirement is that the environment be sustainable over the long term, be viable for humans, and be able to provide clean air, water, and food. Also the environment must be perceived as comprising of both the built and natural environments, and must be liveable from a community and human perspective (Hancock 1993). In addition, it is important to note that in order to achieve sustainable health development, issues in the three circles of environment, community, and economy must be addressed in an integrated manner, not in isolation or piece mealy.

Modeling human health from an ecosystem perspective is designed to overcome the shortcomings of past socio-ecological approaches to health. These approaches were criticized for the lack of centrality of ecological factors. For example, although reference is usually made to the “environment” as an important determinant of health, most emphasis has always been placed on the social determinants. A renewed focus on ecosystem approaches to public health concerns is timely, given the increasing attention of the role of ecological factors on human health, the rapid pace of emerging new diseases, and the growing concerns about climate change. The uniqueness of the ecosystem approach to public health is that, it is not only

interested in improving human health, but emphasizes achieving this through the sustainable management of the environment.

The ecosystem approach has been adopted by a number of institutions worldwide and is being taught at a number of universities, and also incorporated into a number of medical school curricula. For example, in Canada some of these universities include the University of Western Ontario, University of British Columbia, and University of Guelph. Also in Canada, the International Development Research Centre (IDRC) is a pioneer in the application of ecosystems approaches to human health. IDRC makes use of the ecosystem approach to promote health in many developing countries. Given that many of the health problems in developing countries have ecologically components, it probably makes sense from a cost-effective to encourage a wider adoption of the ecosystem approach in many public health settings, as well as integrate it into national health and environment policies. The First Inter-Ministerial Conference of Health and Environment Ministers in Africa, held in Gabon in 2008, saw many African ministers endorse the ecosystem approach to human health as a useful approach to help curtail most of the environmentally-mediated health problems in the region. The core concepts and principles of the ecosystem approach to health will be discussed in the next chapter.

2.7 Towards Critical Public Health

Prior to discussing the ecosystem approach to human health, it is important to draw attention to the continuous evolution of public health thinking to incorporate critical social theoretical perspectives that are emerging from other disciplines such as human geography anthropology, sociology, and education. Critical public health seeks to examine the underlying assumptions, practices, and knowledge claims of the new public health, movement, by placing these claims in an historical and socio-political context (Lupton 1998). This body of knowledge is influenced by critical social theory, discourse theory, and the sociology of science. Scholars influenced by critical perspectives (referred to in this book as critical scholars) view knowledge as socially constructed and mediated through perspectives of the dominant society. They argue that knowledge is always partial and situated within particular systems of meanings and epistemological positions (Nicholson 1990). This is particularly evident within medicine, and especially public health and health promotion. A critical perspective in public health queries the taken-for-granted assumptions underlying health knowledge and practices; examines who controls these assumptions, how public health problems are constructed, defined and explained, and also examines the processes through which alternate views are marginalized and valorized (Lupton 1998). Critical perspectives call for the use of rigorous analytical frameworks to examining phenomena. For example, within public health, the investigation of the causal factors responsible for ill health must be examined with the contexts of their social, political, and historical framings, to ensure the explication of any hidden agendas that may influence proposed interventions.

Drawing on Foucault's writing on medicine and governmentality, critical public health scholars suggest that western scientific claims, including medical and health knowledge systems have become a primary means of organizing and normalizing peoples behaviors and lives (Turner 1994). This critically informed literature views the discursive practices of the new public health as representing new forms of regulation, governance, and social control. According to Lupton (1995), the discursive practices of the new public health, especially those related to health promotion, legitimize ideologies and social practices through the identification of exercise, diet, and behavioral regimes. Also linked to these discussions are notions of knowledge and power, and how they mediate each other.

Ecohealth as an emerging field is yet to fully benefit from these theoretical developments, and this book makes the first attempt to apply such critical perspectives to the field of ecohealth. Critical public health and its application to the ecohealth approach are discussed in subsequent chapters.

2.8 Conclusion

This chapter has traced the evolution of public health thinking from the sanitary paradigm through to the postmodern perspectives of critical public health. As illustrated above, ecological thinking in public health is not entirely new, it is re-emerging as scholars take interest in issues such as climate change, environmental degradation and how environmental conditions mediate newly emerging diseases. This renewed interest has also spawned new approaches such as the ecosystem approach to human health, which is gaining widespread attention among institutions, academia, public health practitioners. With recent developments in the application of critical theory to public health, it is anticipated that ecohealth will benefit from these developments and emerge as a theoretically rigorous field of study.

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