

# A Municipal Perspective on Risk Management and Agriculture

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Intensive livestock operations pose a level of environmental risk that can raise concerns and antagonism within the community. Some of these concerns are justified while others are more perceptual in nature. Municipalities are often lobbied by ratepayers to take action and to manage the risks associated with a changing and sometimes growing livestock industry. People see an evolving livestock industry affecting their personal quality of life, including the air that they breathe and the water that they drink. This paper reviews some of the key societal, demographic and agricultural trends which impact at the community level. These trends translate into certain environmental, economic and socio-political concerns for which this paper offers a range of regulatory, voluntary, educational (research) and community based tools that can be applied to help manage related risks. The challenge for municipalities is to strike an effective balance between these initiatives.

*Key words: Risk management, municipalities, agriculture, land use planning, intensive livestock operations*

Municipalities and farmers are often in the position of having to balance the potentially competing interests of production agriculture with environmental integrity. The intensification of agriculture has often led to conflict within the rural community. As livestock facilities have gotten larger, more geographically concentrated, and more reliant upon technology (such as liquid manure systems), many people have expressed concerns related to odour and water quality. In response to this conflict, provincial and municipal governments are thrust into the midst of the issue and are often pressured to develop criteria to assist with the establishment of new facilities and to regulate existing situations.

Risk Management is a term that is useful in helping to define the municipal role in responding to agricultural change. Risk management generally refers to those strategies that we use to manage risks that pose a threat to our security or well-being (USDA-<http://www.usda.gov>). Agriculture, for example, has used a number of strategies to manage production, marketing, financial, legal and human resource risks (USDA-<http://www.usda.gov>). Municipalities also have a responsibility to identify risks and appropriate strategies to deal with them. These risks may relate to the administration and financing of the municipality or to

safeguarding the well-being of citizens (for example the provision of fire protection services). As agriculture has evolved within the community, municipalities are faced with needing to manage potential risks to continued agricultural productions and to protect ratepayers from risks related to current farm practices.

This paper reviews a number of community and agricultural trends that municipalities must respond to. As the municipality attempts to cope with an evolving agricultural sector, it is pressured to develop tools to manage the risk associated with large livestock facilities. The paper reflects on the authors nearly 20 years of working in the rural municipal planning sector and identifies a number of regulatory, voluntary, educational and community based initiatives.

## The Rural Community and Agriculture: Are They Heading in the Same Direction?

From the time the fertile farmlands of North America were settled by people of European ancestry until the middle of the 20th century, agriculture and the rural community were largely inseparable. Farming was a way of life that largely defined the rural community. Small family based units of production, close association with neighbours, traditional technologies, and minimal change from generation to generation defined agriculture in Canada and the United States. With the increasing mechanization of agriculture following the Second World War, and with numerous social, demographic and technical changes throughout society, the rural

community and agriculture began to head in separate directions. Today, while there remains a strong linkage between agriculture and the rural community, there are many trends that produce a heterogeneous rural community (Caldwell, 1998).

Figure 1 presents key community and agricultural trends. These trends reflect the literature and the author's experience and have been identified because of their connections with the growth and development of the agricultural industry and are reviewed below.

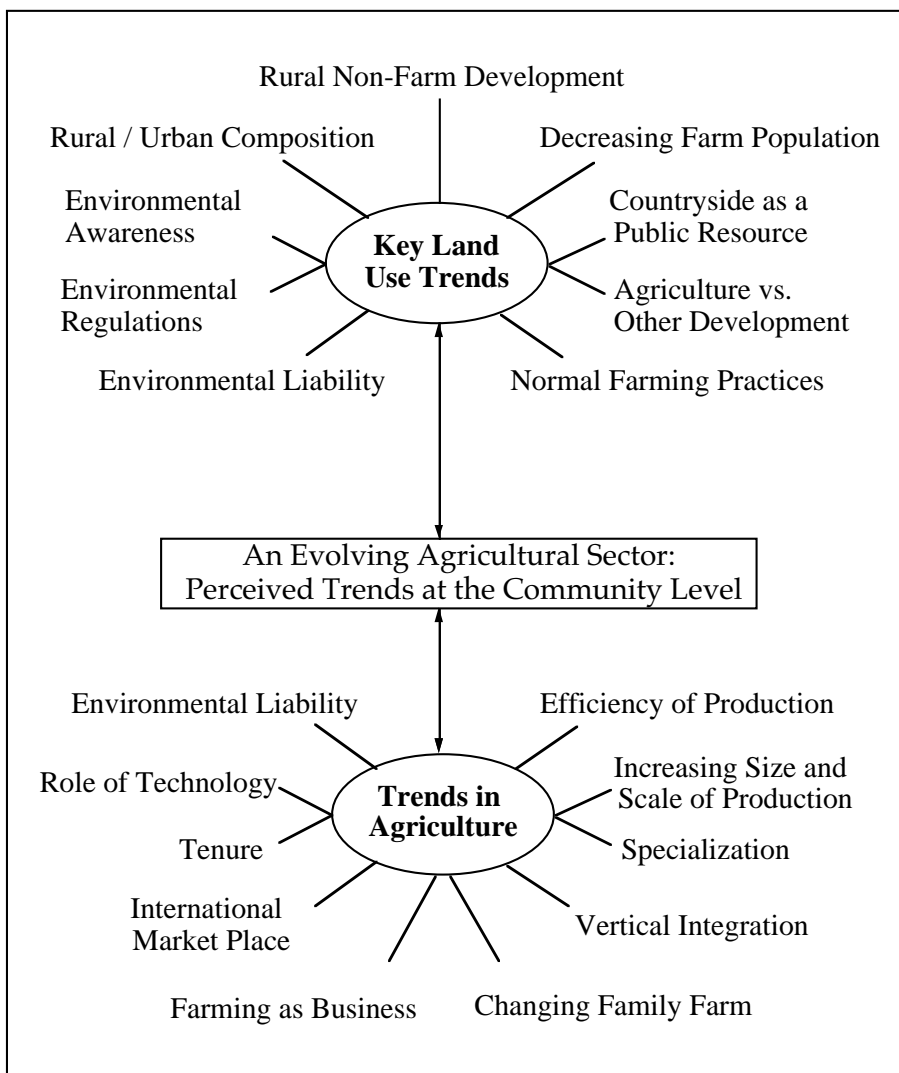


Figure 1: The Municipality and an Evolving Agricultural Sector: Trends at the Community Level

## Rural/Urban Composition

At the national and provincial levels, rural is a decreasing component of the country's population. Across Canada and largely since the end of the Second World War, there has been a continuous shift in the residency of the population from rural to urban. The result is that within Ontario in 1996, for example, only 16.7 percent of the province's population was classified as rural and only 2.1 percent was classified as farm. In 1941, 27 percent of Canada's total population lived on farms compared to just three percent in 1991 (Thibault, 1994). As a result, as rural and agriculture have become relatively less prominent, agriculture and agricultural issues are a much smaller component of the provincial and national agenda.

## Decreasing Farm Population

While there has been population growth in many rural areas, the farm population has generally decreased both in absolute numbers and as a proportion of the total rural population. These trends are evident within the most pronounced agricultural areas. For example, between 1986 and 1996, the rural non-farm population of Ontario grew by 179,892 while the farm population decreased by 17,325 (OMAFRA, 2001). This shift in the rural farm and non-farm population is accompanied by a corresponding increase in the potential for conflict between these groups. These changes also translate into a reduction in the significance of agricultural issues provincially and federally.

## The Growth of Rural Non-Farm Development

Related to the previous demographic trends is increasing urban development in rural areas (Caldwell, 1995; Ministry of Municipal Affairs, 1991). This rural non-farm development raises the probability of conflicts with agriculture, changes the farm/non-farm composition of communities and, by virtue of a higher population density, may contribute to issues of nuisance complaints and corresponding policy restricting certain farm practices.

## The Countryside As A Public Resource

While agricultural areas of North America are predominantly in private ownership, some view the countryside as a common or public resource. While many farmers would disagree with this

view, it is acknowledged that they represent less than three percent of the total population. Consequently, there is the probability that over time legislation and local by-laws will increasingly reflect the broader public perspective. This is particularly true for those ubiquitous resources such as air and water that transcend private property and that clearly are public goods.

## Agriculture Versus Other Development

Many municipal officials seek certain levels of development within their community. For example, the development of rural non-farm lots is a common occurrence in much of rural Ontario (Caldwell, 1995). Often, however, agriculture is not valued to the same extent as other forms of development such as residential or commercial. As a result, policies are often implemented that favour non-farm development. In many instances this can be to the detriment of on-going agricultural activity.

## Normal Farming Practices

Historically the concept of 'normal farm practices' has helped to provide farmers with protection from harassment from neighbouring property owners. This protection can exist within legislation and within the courts as a means of acknowledging that certain farm practices have environmental implications as a normal consequence in the production of food (Penfold et al., 1989). The result has been the continuance of certain farm practices, particularly related to manure handling and disposal, that might be construed as normal, but that may not be in the best interest of the environment. It seems apparent that given the need to ensure high environmental standards the farm community will be held increasingly responsible for farm practices and their implications for the environment.

## Environmental Awareness

Society has become increasingly aware and concerned with issues that contribute to the degradation of the environment (Caldwell, 1994). This environmental awareness contributes to the public being much less accepting and tolerant of issues related to agriculture and the environment. In Ontario, a number of deaths from suspected contamination of water from livestock (E-Coli bacteria) has placed much scrutiny on the livestock sector.

## Environmental Liability

Related to increased environmental awareness is an increasing liability that potentially exists as a result of air or water contamination from agricultural practices. The potential for nuisance suits, and accidents or poor management that contaminate surface or ground water are likely to lead farmers and their insurance companies to be increasingly careful in the establishment and maintenance of livestock facilities (Caldwell and Toombs, 1999; Carter and Owen, 2000). Issues related to environmental liability will likely lead municipalities to more rigorously enforce and develop by-law provisions that pertain to the establishment and management of livestock facilities.

## Elected Officials and Environmental Regulations

With changes in society, demographics, political influence and the composition of the farm community, elected officials are increasingly willing to establish, implement and enforce environmental regulations and to not come to the defense of farmers when an issue or complaint develops. Over the last 20 years, for example, the author has witnessed increasing municipal regulation related to issues related to the land base available for manure disposal, the proper use of manure and nutrient components, the type of manure storage, the distance to non-farm uses, the methods of manure disposal, and the size and type of livestock operations.

## An Evolving Agricultural Sector

Figure 1 also identifies the importance of a number of trends that have had a profound impact on agriculture and the way it is perceived within society. Since the end of the Second World War, there has been increasing industrialization in the nature and scale of agricultural production. Increasing specialization, and intensification of production are evident in a number of agricultural categories (for a general overview of these trends see Ward, 1999). These evolving and ongoing agricultural trends continue to have an impact at the community level and in turn affect how municipalities respond to agriculture.

Increasingly, agriculture is moving in the direction of larger, specialized, more efficient and more intensive operations. In an attempt to find increasing efficiencies and in response to the

cost price squeeze, farmers find that net returns per unit of production are decreasing, dictating larger and larger operations. Between 1951 and 1996 for example, the total number of dairy farmers in Ontario dropped from 40,000 to 8,320 (Surgeoner and Grieve, 1995; OMAFRA, 2001). During the same time the number of farmers reporting hogs dropped from 93,564 to 6,777 (Surgeoner and Dalrymple, 1995; OMAFRA, 2001). In the United States, the numbers are even more drastic, with the total number of pork producers having dropped from three million farms to 150,000 - a 95 percent drop (Henderson, 1998). Moreover, according to the Center for Rural Affairs (as reported by Henderson, 1998), just 50 producers now farrow 40 percent of U.S. hogs. This move towards fewer, but larger, farms is also repeated in the dairy and poultry sector. Specialization has also affected the way in which the farm unit is perceived within the community. Larger 'single industry' production units (with geographic concentrations) have meant that it is easier to focus on those sectors and practices in agriculture that are less acceptable and potentially damaging to the environment.

Associated with this move to larger, more intensive operations is a trend towards a vertically integrated approach to agricultural production. Increasingly, the elements of production, marketing, financing, and processing are linked together. In the livestock industry, for example, there are strong linkages between each of these components. The result, at the community level, is that there is less willingness to accept the individual management decisions that are made for these large corporate farms. The perception is that decisions at this level will not reflect the same stewardship or community based ethic of individual family farmers. Whether this perspective is correct or not is a point for debate, but the perception is held by many farm and non-farm individuals. The resulting perception is that there is a disconnectedness between agriculture, the farm, and the rural community.

For both large corporations and small family farms there is a reality to production as they try to cope in the 21st century. Farming is big business competing in an international market place. In order to remain competitive in this market, farmers are required to evolve, change and adapt their approach to agricultural production. The results, in some instances, are decisions that others within the community find difficult to

support. Related issues include the continued adoption and reliance upon technology and issues related to tenure. Some within society perceive that those systems which rely on technological control are more at risk than traditional systems that rely solely on human involvement. For example, the traditional stack of manure sitting behind the barn is often viewed as less environmentally offensive than a large liquid system contained within a concrete facility and applied using modern technology (the author has witnessed for example, extensive conflict related to the establishment of new barns using liquid systems, while older traditional systems receive much less public scrutiny). The approach to the ownership and management of land has also changed within the rural community. Today much less of the land base is controlled by individual resident farmers. There is a much higher proportion of non-farm ownership, absentee owners and a tendency for corporations to own very large land holdings. Some believe that this tenure system is much less concerned with an environmentally responsible approach to land stewardship.

These trends in agriculture and in particular the move to larger, more intensive livestock operations have contributed to a number of community and municipal concerns. In response, there is a range of specific actions which municipalities are considering (Figure 2). The following section sets the context for these approaches.

The issues and concerns identified in Figure 2 are both perceptual and real. First, perceptual issues may not have any real or scientific basis but are perceived as real by the public and, in turn, may generate political support leading to political action. As a result, certain legitimate and environmentally benign practices may be challenged because of the public's negative perception or lack of tolerance. There may not, for example, be any scientific argument against the storage of liquid manure in a concrete facility or with the proper application of manure, or with a livestock farm on a small acreage; however, these issues are real to many people and in turn may lead to municipal regulation. Second, there are many real issues associated with livestock production. In addition to the effects on air quality, as the size and scale of livestock facilities increases so too does the potential risk of a spill leading to the contamination of ground and surface water.

Figure 2 identifies three general community concerns associated with large livestock operations: environmental, economic and socio-political. Environmental concerns include issues related to odour, stewardship, and water quality. While odour is an expected by-product of livestock farming, the concentrations of livestock odour and the ability to single out individual farms or livestock types (example hogs) in combination with community trends such as non-farm growth contribute to the prominence of this issue. Concerns over water quality relate to both surface and ground water. The impact of agriculture on water quality is a heated issue within many rural communities. While the magnitude of the problem is often debated, issues related to manure spills and the occurrence of non-point source contamination is clear evidence of the negative impact agriculture can have in these areas. In the United States earthen lagoons and a number of recorded 'catastrophic spills' have brought much bad press (Henderson, 1998). In Ontario, attention has been more focused on issues of manure handling and application and the corresponding impact on surface and ground water (Livestock Manure Pollution Prevention Project, 1998). The tragedy at Walkerton, Ontario (June, 2000) in which a number of people died from contaminated water has generated a public outcry over water quality in a way not previously seen in Ontario. While the role of agriculture in this tragedy is still to be determined, logic dictates that liquid manure, poor management, and high concentrations of livestock are a concern.

Economic issues are largely related to environmental concerns. Odour in particular can potentially have an impact on real estate values. While the issue can be exacerbated by significant non-farm development, it is not exclusively a farm versus non-farm issue. In Huron County within south-western Ontario, for example, the significant debate over the last few years involved farmers, non-farmers, cottagers and urbanites. Property value issues, while notoriously difficult to prove, can be exceedingly emotional and challenging to respond to. Municipalities have often responded with strong agricultural policies to prevent the establishment of non-farm uses, and provide separation distance criteria for farm and non-farm activity, but in many instances municipalities have been pressured to restrict the size, and type of livestock operation.

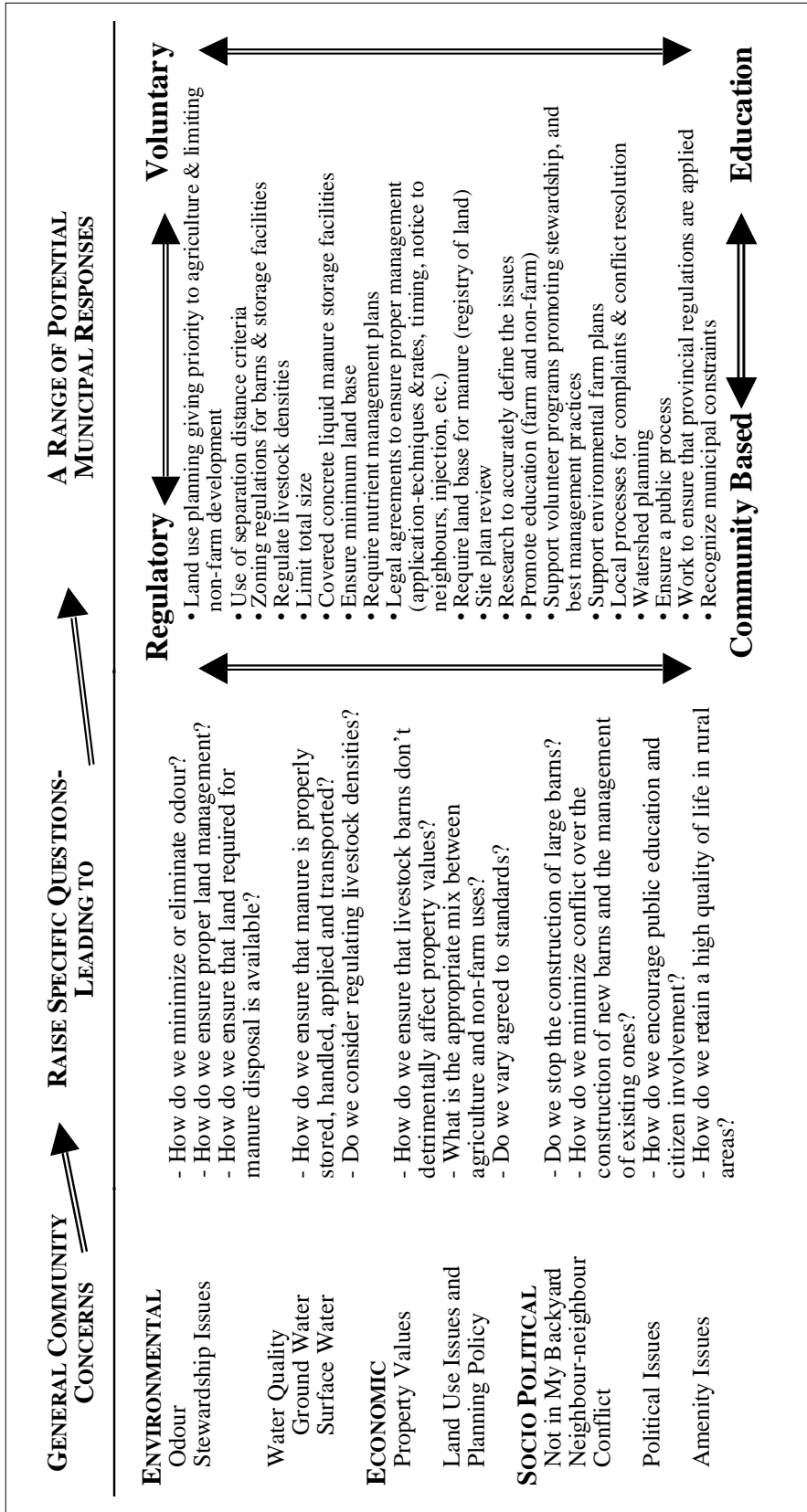
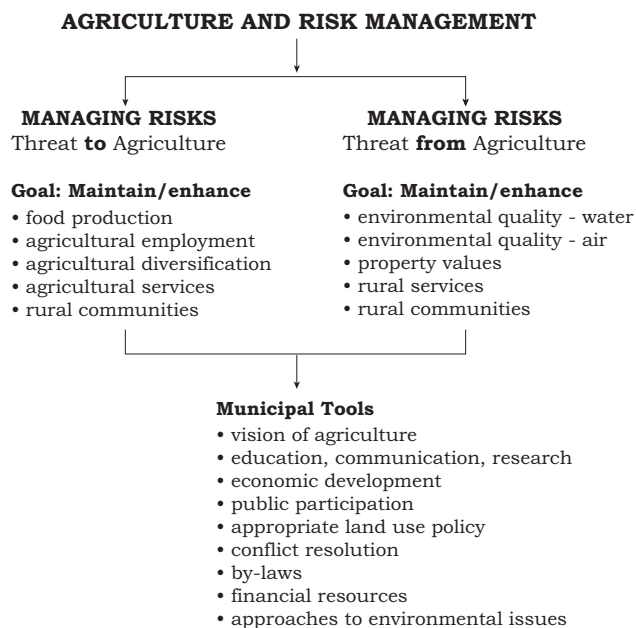


Figure 2: Large Livestock Barns, Community Issues and Municipal Response

Socio-political issues, like economic issues can be very difficult to deal with. Opposition to large livestock barns often sounds like the 'NIMBY' syndrome (not in my back yard) and can lead to intense emotional debate and conflict between neighbours. The debate can pit one sector of the community against another, raise fundamental questions about how we want our communities to evolve and can lead to questions concerning the role of agriculture in the community. This emotion can complicate the best intentions of involving the community in policy development, implementation and on-going monitoring. As municipalities reflect upon the changes that have occurred in agricultural production they are faced with needing to manage two separate types of risks. From a municipal perspective, it is appropriate to ensure that agriculture is maintained and enhanced while at the same time ensuring that agricultural practices are consistent with broader community goals, including environmental quality (Figure 3). In response municipalities have attempted to develop and implement a variety of approaches. The balance of this paper focuses on issues of risk management and related options for a municipal response.



**Figure 3:** Agriculture and Risk Management from a Municipal Perspective

## Constraints to Municipal Involvement

Across North America there are a variety of municipal approaches designed in response to these environmental, economic and socio-political concerns. The nature of municipal involvement varies across the continent and within individual provinces and states, and reflects different attitudes towards agriculture and the livestock industry. These differences reflect the role of agriculture within the local economy, the relative presence of non-farm development, the community's recent experience with agriculture, the relative health of the local environment and the nature and extent of the livestock industry. There are, however, constraints on municipal involvement. Some of these are described below.

### Jurisdictional Constraints

Municipalities are established, subject to and empowered by legislation. The passage of by-laws can only occur in those areas where provincial legislation establishes municipal authority. In Ontario, the Planning Act, Municipal Act and Building Code are the key tools and, even under this legislation, there are constraints in terms of the types of issues that can be addressed and the types of by-laws that can be passed. By-laws that are passed without appropriate legislative backing are subject to review and may be quashed by the courts.

### Public Rights

Related to the jurisdictional constraints that inhibit certain municipal action are the legal rights enjoyed by individuals. Included in these are the rights of farmers to challenge the legal basis for municipal action and to farm with minimal interference subject to compliance with appropriate requirements of local, provincial and federal authorities.

### Enforcement Issues

Governments - local, provincial and federal - have been known to pass by-laws and regulations for which they do not have the financial or human resources to implement. Any attempt to enhance the municipal role as it pertains to livestock agriculture needs to recognize this constraint.

## Public Support

The successful implementation of by-laws is largely predicated on support from the public in terms of the need for, the appropriateness of, and the fairness of the regulatory action. Not only is the support of the general public essential, but so too is the support of the farm community. This reiterates the need to avoid taking action prematurely, and to work to develop an approach that is understood and acceptable.

## Protecting the Agricultural Industry and Maintaining Competitiveness

Municipalities with an active agricultural industry need to recognize the importance of agriculture, and maintain its ability to compete in the local and global market. By-laws that unduly restrict the ability of agriculture to evolve, or establish unrealistic financial impediments are likely to contribute to an unhealthy and potentially uncompetitive agricultural sector.

## Provincial Policy and Direction

Frequently, municipalities must contend with policy and programs which reflect provincial policy and priorities. These policies often set the fundamental direction that municipalities should (or shall) follow. In Ontario, for example, provincial policy directs the use of separation distances between livestock and non-farm uses. In the United States, state or federal policy also provides direction to municipalities. For example, “confinement operations - no matter how factory like - are generally considered farms and are usually protected by right-to-farm laws, zoning exemptions, and other special treatment” (Henderson, 1998, 8).

## Towards a Municipal Response

Within Canada there exists a combination of local and provincial guidelines and laws that pertain to livestock facilities. In addition to Right to Farm Legislation, which has been adopted by all Provinces (excluding Newfoundland), there also exists Environmental Protection Legislation and, in many provinces, Codes of Practice or Guides to Agricultural Land Use. Throughout much of Canada, local municipal by-laws have been pursued, although their impact on the siting of livestock facilities varies. In Manitoba however, the local elected council has considerable discretion in their review of large livestock

operations (Manitoba Agriculture, 1995) and, in Ontario, the local focus has included a number of controls under the planning system including official plans, the Agricultural Code of Practice, zoning by-laws and by-laws regulating manure pits (Caldwell and Toombs, 1999). Most recently, the direction in Ontario has been for municipalities to require the completion of Nutrient Management Plans prior to the issuance of a building permit for an ‘intensive’ livestock operation (Ontario Farm Environmental Coalition, 1998).

As the need for increased food production escalates, as the trend to larger livestock facilities continues and as the population of North America grows, the municipal response to livestock production will be increasingly outside the realm of traditional land use planning. While a more formal land use planning response will be required, it should be viewed as only one of several tools open to municipalities. The challenge will be to develop an approach that strikes a fair and effective balance between agriculture, the environment and the community. Figure 2 focuses on a number of approaches under four key headings: regulatory, voluntary, education (and research) and community based.

In developing a response to an intensifying livestock industry, municipalities need to identify and evaluate the probable success of individual approaches. While public pressure in response to the concerns identified in Figure 2 is likely to push municipalities into a regulatory mode, voluntary, education and community based approaches may add substantially to the potential success of municipal intervention.

Regulatory approaches include numerous municipal actions aimed at both a proper balance between agriculture and the non-farm community and at the proper siting and management of the livestock industry (see Caldwell and Toombs, 1999 and Caldwell, 1998 for more detail). The first of these, and potentially the most successful, is a land use planning program that respects and gives priority to agriculture within rural areas. This approach, while long-term, provides the opportunity to minimize perceptual issues. The absence of an urban concentration of population and a less dense rural population is likely to minimize potential conflict between farm and non-farm uses, thereby minimizing the need for government regulation and involvement in agriculture. There is then the opportunity to focus on those

issues that constitute a real threat to the environment and rural populations. The appropriate regulation of the livestock industry can provide assurances to society and protect the environment. Separation distance requirements between farm and non-farm uses, zoning regulations, a minimum land base, and the requirement for nutrient management plans are examples of appropriate directions. More debatable, but pursued by some municipalities, are attempts to regulate total size, and ban certain types of facilities, regulate livestock densities, require legal agreements to guarantee compliance with certain standards, and implement a registry of land for manure disposal, among others. There is obviously a place for regulatory actions, but regulatory actions on their own are not likely to achieve the high standards that society and, increasingly, the farm community demands.

Voluntary programs and approaches provide an opportunity to overcome many of the limitations associated with the sole reliance on regulatory initiatives. Many of the problems that exist within the agricultural community are historic in nature and difficult to regulate. Rates of manure application, over-fertilization, livestock access to streams, and application of manure in less than optimal conditions are examples of troublesome activities that tend to go beyond the jurisdictional and practical abilities of the municipality to regulate. While municipalities may not want to be involved in the direct delivery of voluntary programs, there are numerous farm organizations and provincial (or state) programs that concern themselves with promoting high standards of farm management. In Ontario, the Environmental Farm Plan has been very successful at enlisting farmers on a voluntary basis to adopt agricultural environmental planning. Likewise the program 'Healthy Futures for Ontario Agriculture, 1999' offers the promise of co-operation between the farm community, municipalities and the province in an attempt to address these types of issues. Similar examples exist in the United States (Bellows, 1996). The success of these types of programs can be summarized in the context of the many who collectively and voluntarily improve their environmental practices versus the few who are regulated to do so (recognizing the differences that exist between regulating siting and management practices associated with new operations versus many existing operations).

Related to voluntary approaches are programs of education and research. A clear understanding of the issues can be facilitated through municipal involvement, both in terms of research and also through the dissemination of information. Helping to ensure community based dialogue and through the public development of policy, information can be shared between farm and non-farm interests. Moreover, even though the requirement for a nutrient management plan might be thought of as a regulatory initiative, the benefits are largely educational, i.e. making sure that the farmer of a new large operation is fully conversant with the issues, opportunities and risks associated with a large operation. In a similar fashion, voluntary programs associated with 'watershed planing' are largely educational. As a tool to help citizens within a community understand the dynamics between human activity and the environment in the context of a watershed, it can be a useful awareness building initiative.

Finally, municipal initiatives should be community based. They should occur with a goal of facilitating open discussion between various interests in the community and should respect the rights of citizens to participate, influence and affect municipal policy. Programs of dealing with complaints through conflict resolution can be useful as a means to diffuse conflict, share information and foster understanding of differing views. This notion of being community based applies to all facets of the municipal response: regulation, volunteerism and education.

## Conclusions

Today's modern and often intensive livestock industry poses certain risks and can raise concerns and antagonism within the community. Some of these concerns are justified while others are more perceptual in nature. Whether real or perceived, however, these concerns are being taken seriously by municipalities and need to be treated seriously by producers. Municipalities are often lobbied by ratepayers to take action and to manage the risks associated with a changing and sometimes growing livestock industry. People see an evolving livestock industry affecting their personal quality of life, including the air that they breathe and the water that they drink.

Municipalities are thrust into this debate concerning the future of livestock production for three key reasons. First,

municipalities are the level of government that most closely reflects local community composition; second, responsibility for land use issues and planning is generally vested at this level and third, municipalities tend to be more accessible and responsive to local concerns and community wishes than other levels of government. This paper offers a range of regulatory, voluntary, educational (research) and community based tools that can be applied at the municipal level to help manage related risks. The challenge for municipalities is to strike an effective balance between these initiatives.

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