
PLANNING AND FOOD SECURITY WITHIN THE COMMONWEALTH: DISCUSSION PAPER

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Foreword by Clive Harridge
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The Commonwealth Association of Planners (CAP) is very grateful for the valuable work of Professor Wayne Caldwell, Anneliza Collett, Therese Ludlow, Ian Sinclair and Jenny Whitehead in preparing this discussion paper on one of the most serious challenges facing Commonwealth countries.

Access to food is a basic human need but unfortunately that human need is not being met in many areas and achieving food security is a major challenge. Planning has a significant role to play in addressing threats to food security but this is not a topic that is currently featuring strongly in planning practice. This must change.

Food security is a major issue for Commonwealth countries and is recognised as such at the highest levels of Government. The Commonwealth Heads of Government at their biennial meeting in Trinidad and Tobago in November 2009, expressed their deep concern about world food security (1). Recognising that poverty was the fundamental cause of food insecurity, Heads of Government also identified threats posed by climate change, lack of access to fresh water, dumping of waste and volatile commodity and energy prices. They called for increased investment in sustainable agriculture, rural development and natural resource management and they stressed the importance of a coherent, multi-dimensional approach to sustainable agricultural development and food security. Heads of Government recognised the need to increase food production particularly in countries most affected by hunger.

The Discussion Paper together with its Call for Action will be highly valuable in raising awareness and understanding of planning and food security challenges across the Commonwealth. The Paper will be used by the CAP and others to open up a wide discussion and sharing of ideas.

Note

1. *The Port of Spain Communiqué*, Commonwealth Heads of Government Meeting, Trinidad and Tobago, 2009. Published by the Commonwealth Secretariat.

It is estimated that every year, we lose an area of farmland greater than the size of Scotland to erosion and urban sprawl while at the same time we add more than 70 million people to the planet's population (Wright, 2004)

1.0 Introduction

At a fundamental level, quality of life is intrinsically connected to the degree to which basic human needs are met. While the planning system has historically concerned itself with clean air, clean water, and the adequacy of shelter, minimal attention has been directed towards another basic human need: food. The World Food Summit in 1996 defined **food security** as existing when: "all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (World Food Summit (1996), cited in FAO, 2006, pg 1).

According to the *Policy Guide on Community and Regional Food Planning* from the American Planning Association (APA) (2007, p. 1):

Food is a sustaining and enduring necessity. Yet among the basic essentials for life — air, water, shelter, and food — only food has been absent over the years as a focus of serious professional planning interest. This is a puzzling omission because, as a discipline, planning marks its distinctiveness by being comprehensive in scope and attentive to the temporal dimensions and spatial interconnections among important facets of community life.

This concern with food availability and food security can be found across the Commonwealth. Every member country has its own particular and diverse set of issues that can be summarized into key themes. The global consensus is that population and food prices are increasing; while food access is decreasing. At the same time fossil fuels and clean water sources are being depleted and climate change is occurring. Additionally, there are competing demands on agricultural land for uses other than food production. This is not just a local problem, it is also a global problem. There is an increasing sense of urgency for appropriate action that will enhance food security building on principles of sustainability. From a planning perspective the topic has been gaining momentum.

The APA has recently released a *Policy Guide on Community and Regional Food Planning* and the Ontario Professional Planners Institute (Canada) has dedicated its 2010 symposium to 'Planning for Food'. The topic is also receiving extensive attention from the research community. The Royal Town Planning Institute (London, England) released a policy statement entitled *Planning for Food* in August 2010 stating that the "farming industry is not only central to the UK's long term food security, but also the sustainability of food production, food policy and consequently people's health" (RTPI, 2010). The paper also stresses the importance of planners' role in the discussion and planning system of agricultural systems within planning policy by stating: "both development planning and the development management functions need to be

recognized as an important tool to help improve UK food security in the longer term — giving consideration to the wider land use and spatial implications” (RTPI, 2010).

Food safety is also leading to new partnerships between planners and the health profession as seen in the example of Australia as discussed in Budge et al.’s 2009 article “Integrating land use planning and community food security: A new agenda for government to deliver on sustainability, economic growth and social justice”. Food security is as much a health issue as it is a planning issue. Linking planners with other professions in determining a solution to the food security dilemma allows for new and exciting future partnerships.

1.1 Purpose

This paper has a fundamental goal of raising awareness and encouraging dialogue concerning the importance of planning for food and food security amongst planners and within communities across the Commonwealth. In support of this there are four basic goals:

- 1) To identify relevant trends affecting food production and food security. These trends are related to land use, food production and distribution, land loss, and risks to food security, among others.
- 2) To establish the link between food security, natural resource management, land loss, and planning.
- 3) To explore the role of the planner in planning for food production and distribution in addition to explaining why food security is a planning issue.
- 4) To identify and share innovative, best practices (and where appropriate to provide a series of recommendations for planners).

This paper builds upon the experience of the authors (based largely in Australia, Canada, and South Africa). It draws upon academic literature and related government reports. It is recognized that there is a wealth of diversity and experience across the Commonwealth, in developing and developed nations, that cannot be fully captured in a paper of this nature. Also, the importance of aquaculture and its role in food supply systems is beyond the scope of this paper. This paper, however, is intended to begin a dialogue that will lead to a much broader discussion and sharing of ideas.

2.0 The Context for Agriculture and Food across the Commonwealth

The Commonwealth is a “voluntary association of 54 countries that support each other and work towards shared goals in democracy and development” (Commonwealth Secretariat, 2010). The Commonwealth is made up of small, large, developing and developed nations, consisting of approximately two billion people. It spans from Africa to Asia, the Americas, and includes the Caribbean, Europe and the South Pacific (Commonwealth Secretariat, 2010).

As stated by the Commonwealth Secretariat:

Commonwealth countries work together in a spirit of co-operation, partnership and understanding, beyond the ties of history, language and institutions, it is the association's values which unite its members: democracy, freedom, peace, the rule of law and opportunity for all. (Commonwealth Secretariat, 2010, para. 8)

Planning for agriculture and food is a necessary task for Commonwealth countries. Having a range of environmental, economic, and social characteristics, the state of agriculture and food can differ across these nations. The integration of differing perspectives, experience, and knowledge can contribute to an informed outlook on food security and agriculture. It is important to recognize what agriculture and food security mean for the particular Commonwealth countries. The agriculture and food security issues arising within developed countries may not be the same issues developing countries are contending with. However, the issue of food security is of importance across all nations of the Commonwealth.

The FAO (Food and Agriculture Organization) states that agriculture is expected to feed a population of 9.1 billion by 2050. It also states that agriculture is the main livelihood of 75% of the poor in developing countries (FAO, 2009a). This is true within the Commonwealth as well, where agriculture is the backbone of the economy of many countries. According to Sneddon (2009) the agricultural sector contributes 30%–60% of gross domestic product (GDP) for many Commonwealth countries. Agriculture, therefore, provides not only food but also income and employment and is, therefore, a major element of international trade. Additionally, in 2007, “agricultural exports for commonwealth countries represented 33 percent of total exports for members in the Caribbean region, 14 percent in South Asia, 35 percent in Africa and 53 percent in the Pacific” (Sneddon, 2009).

Emerson and Wallis's 2003 paper discussed the issue of sustainable agriculture. They noted that sustainable agriculture can be defined in terms of whether emphasis should be placed on production or on natural resource conservation:

Protagonists of intensive agriculture favour the argument that agriculture is not sustainable if it does not feed the world. This group also cites the successes of the Green Revolution in improving agricultural yields, and is optimistic about the potential of agricultural biotechnology and free trade.

Principles of Food Sovereignty as Defined by Via Campesina:

1. Food is a basic human right.
2. Genuine agrarian reform is necessary to give landless and farming peoples, especially women, ownership and control of the land they work.
3. Protecting natural resources especially land, water, seeds and livestock breeds.
4. Reorganizing food trade so that national agricultural policies support the number one priority of domestic consumption and food self-sufficiency.
5. Ending the globalization of hunger by not allowing multinational corporations to undermine food sovereignty and control agricultural policies.
6. Social peace must be kept by not allowing food to be used as a weapon to marginalize and oppress poor people.
7. Democratic control must be implemented by allowing small-scale farmers to have direct input in formulating agricultural policies.

Retrieved from: *Food Sovereignty. Is it Achievable?*, Taylor-Cole (2010)

Why Planners' Involvement in Community Food Assessment is Important

Planners are trained to focus on communities. They conceptualize, collect, organize, and disseminate information about communities to both inform policies and evaluate their outcomes. They are trained to lead, facilitate, and manage community-based group processes, they are able to analyze the spatial dimensions of community needs, concerns, resources, and goals translating them into spatial and land-use policies. They are linked to decision makers and decision arenas in public, private, and non-profit sectors. Planners can recommend decision makers appropriate policies and plans that deliver preferred outcomes. They bring interdisciplinary perspectives and the capacity to identify new community concerns at the intersection of multiple disciplines while incorporating them into planning.

Source: *Community Food Assessment: A First Step in Planning for Community Food Security*, Pothukuchi (2004)

The alternative perspective is that food security is not solely dependent on agricultural productivity. By placing greater emphasis on the conservation of land, water, plant and animal genetic resources, more people will have access to food, and the potential for sustaining or enhancing productivity levels will be maintained. This group points to the mounting problems of agricultural pollution, soil erosion and degradation, loss of agricultural biodiversity and inequitable access to the means of production and exchange as causes for concern. (Emerson & Wallis, 2003, p 4)

Another perspective views food sovereignty as the route to ensuring food security. Movements such as the international peasant movement, known as Via Campesina, advocate seven principles that define food sovereignty. These principles include viewing food is a basic human right as well as the importance of protecting natural resources, especially land, water, seeds, and livestock. See text box on previous page for all seven principles. It is through these principles, Via Campesina believes, food security would be attained (Taylor-Cole, 2010).

Additionally, at an international level, many countries are working toward millennium development goals (MDGs) i.e., benchmarks set to tackle extreme poverty by the international community through tailoring each country's development needs both locally and globally. These benchmarks are to be achieved by 2015. Of the eight goals two are focussed towards eradicating extreme hunger and poverty while ensuring environmental sustainability. The World Food Summit on Food Security in 2009 brought forth similar goals: to work toward eradicating hunger; to examine governance issues; to work on fair competition in markets and on ensuring farmers' incomes; to promote investment in agriculture; to evaluate strategies dealing with food crises; and, finally, to ensure countries can adapt to climate changes.

In addition to addressing the socioeconomic aspects of food security and agriculture a dynamic interaction should be encouraged among natural resource specialists, agriculturalists, and planners — especially land use planners to ensure that the most suitable land use is identified for optimal utilization.

As noted above there are many perspectives and positions concerning food security and agriculture. There is an opportunity for planners to play a key role adding their professional perspective on food security. As Pothukuchi (2004) states, planners are trained on the subject of communities, they are concerned with the overarching and normative goals of healthy and sustainable communities. Therefore, the importance of

planners in understanding and contributing to food security is critical. (See text box on the previous page.)

Figure 1 ‘Planning for Food Security’, captures much of the contextual information that makes planning for agriculture and food such a challenging issue. This diagram acknowledges the many environmental, economic, and social factors that affect the strategies that are followed in Commonwealth countries. The issues that have to be considered when planning for food security can be grouped into two categories: first, Environmental Opportunities and Constraints; and, second, Social and Economic Factors. We also need to consider sustainable development and catchment management (the impact that development will have on water quality and land degradation). While these factors, opportunities, and constraints vary in the Commonwealth there is a need to consider the overarching context of planning for agriculture and food.

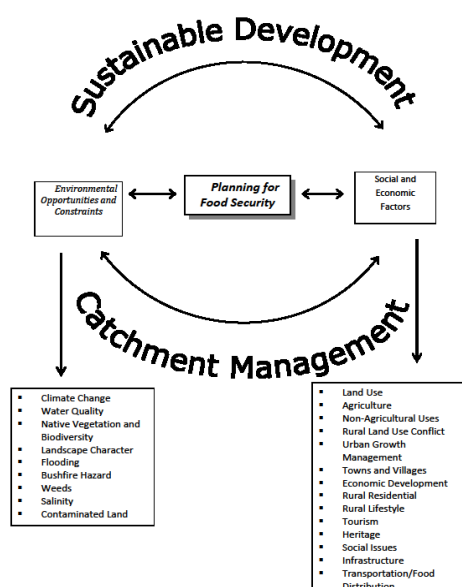


Figure 1: Planning for food security – Issues and themes:
An Australian perspective. Source: Sinclair (2002)

3.0 Risks to Food Security

Food security risks can be described in terms of their environmental, social, and economic drivers. Ultimately, in Commonwealth countries, as in other parts of the world, environmental factors such as drought and land degradation present the greatest challenges to achieving food security.

The production and distribution of food is reliant on a range of natural resources that are under threat due to global changes. Water scarcity, land degradation, the loss of farm land to non-food-producing uses, and diminishing oil resources, all affect efforts to meet food needs and accomplish sustainable development.

Water scarcity. One third of the world's population lives in climatic zones collectively referred to as drylands¹. These are particularly susceptible to land degradation, and persistent degradation leads to desertification. When this occurs, basic human needs cannot be met. Water scarcity, therefore, is the single biggest risk to global food security.

Already we are seeing internal migrations of whole villages of environmental refugees leaving their ancestral lands to flee to urban centres, and this is expected to accelerate as climate change advances. "Each year, five to ten million hectares of agricultural land are lost because of degradation caused by water shortages" (Stigset, 2008 as cited in Clapp & Cohen, 2009). Linked to water scarcity is also water quality.

Land degradation. A condition not limited to drylands. Reduction or loss of biological productivity is caused, worldwide by poor agricultural and land stewardship practices that include inadequate water and soil resource management; veld management; salination due to over-irrigation; erosion; and reduction or loss of pollinator species. The United Nations Environment Programme (UNEP) estimates that 0.2% of global cropland productivity is lost every year due to unsustainable agricultural practices (FAO, 2009a).

Over the past half-century, more than one-quarter of the world's 8.7 billion hectares of agricultural lands, pastures, forest and woodlands have been degraded through misuse or overuse, with another 5–10 million hectares added each year. (Shah & Strong, 2000, p 21)

Productive farmland loss. This is a significant risk to food security. It arises from demand for competing land uses such as biofuel cultivation; rural residential development; urban expansion; and abandonment. These competing land uses may

Human settlement can take two forms: Urban expansion and rural residential development

In some countries rural non-farm residential development is affecting agricultural production: "The residential use of rural land is called rural residential development; that is, people live on rural lots, but use the land primarily for residential rather than agricultural purposes" (Sinclair & Bunker, 2007).

Rural residential development can be divided into two main categories: rural fringe and rural living (Sinclair & Bunker, 2007). Sometimes this rural residential development can have a greater impact on food production than actual urban expansion. Food production has effects off the site which include: noise; odours; dust; night time activities; farm chemical spray drift; and an effect on landscape and the amenities of rural areas. These effects cannot be contained within the boundaries of the farm and often will impact on the adjoining land.

Noise is a good case in point. In rural areas it is very quiet, especially at night, and the noise of a tractor or water pump will travel long distances. This can cause a loss of quality of life for adjoining owners who are not farmers who use the rural land for residential purposes. They will complain and the Government can require the farmer to curtail the noise thereby affecting the farm's operations, which invariably leads to the farm closing down.

¹ Drylands are regions that receive less rainfall than the moisture potentially lost through evaporation and transpiration. They occupy between 40% and 50% of Earth's land surfaces and are home to more than two billion people. Most of Australia, Central Asia, parts of Canada, and two-thirds of the African continent are drylands (UNCCD, 1995).

also encroach on previously uncultivated land that has high potential for agricultural use.

Crops used for production of liquid **biofuels** compete for the same land resources as food crops. Despite concerns about the threat to food security, there was a threefold increase in liquid biofuels use over the period 2000–2008 (FAO, 2009b).

Many Commonwealth countries have introduced measures to limit the **conversion of agricultural land** to other uses, or to restrict subdivision of land to parcels that are too small to be agriculturally viable. This is done to maintain a reserve of land for food production and to curtail the encroachment of urban and rural residential development into food producing areas. Particularly, in the more developed Commonwealth countries, urban sprawl, and ‘hobby farmers’ represent a threat to limited reserves of high quality agricultural land. Figure 2 illustrates what is commonly referred to as the ‘cycle of farmland conversion’.

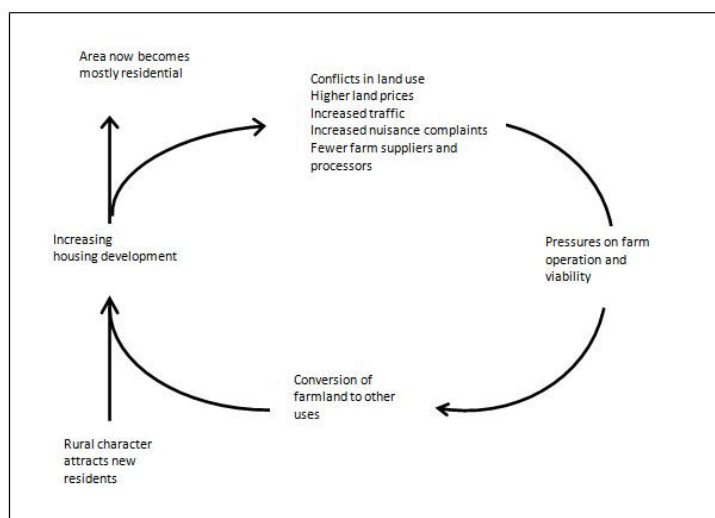


Figure 2: An example of land use trends: The cycle of farmland conversion Source: Daniels & Bower (1997, p. 6)

Current food production and distribution systems are largely reliant on environmentally costly and **unsustainable fossil fuel** based manufacturing and transportation technologies. The unevenness of food production capacity across the Commonwealth, and the globe, means that transportation is an essential component of food security. Increases in transportation costs have far-reaching consequences.

In addition to environmental factors described above, there are also a number of social and economic pressures that constitute a risk to food security.

Loss of farms. Low levels of profitability from farming, property taxes, high returns from sales of farmland for residential development, and urban-agricultural land use conflict are cited as reasons for farm abandonment or conversion to other uses. Financial

incentives and subsidies may entice farmers to stay on the land but are not always sustainable. The EU's Common Agricultural Policy has caused such distortions in international markets so as to attract harsh criticism (Buckwell (2007) as cited in Caldwell, Hilts, & Wilton, 2007).

Access to food. In some parts of the world food is limited because of: poverty; political instability; poor infrastructure; underinvestment in agricultural development; and a lack of expertise. Subsistence farmers, who represent a significant sector of the population in many of the Commonwealth's developing countries, are particularly vulnerable to environmental and economic shocks. Governments typically lack the resources to provide support, resulting in high levels of malnutrition and dependence on external interventions and imports as is noted by Charles Runge, the Honorary Secretary of the Royal Agricultural Society of the Commonwealth, who introduces the paper 'Sustainable Agriculture, Sustainable Life' (2003).

The FAO estimates that the calorific intake per person should be 2,350 kilocalories per day. Some 54 countries fall below this minimum — most in sub-Saharan Africa, where the Commonwealth has 19 members. And yet, world food production figures show that theoretically enough food is available for 2,805 kilocalories per day. The problem is this is unevenly distributed and poor countries cannot afford to make up the shortfall by importing.

A policy focus on agricultural production can have the dual benefit of addressing food security but can also be an important strategy in the reduction of poverty and the creation of jobs.

Access to land and security of tenure. Food security, according to the United Nations Economic Commission for Africa (2009) "depends on the land resources available to the household or community and their ability to mobilize resources for the production and/or distribution of food to achieve an active and healthy life". For many households in developing countries, the only means of achieving a modicum of food security is to be self-sufficient, growing crops on plots of up to two hectares for their own consumption or localized sale. This is only possible where people have access to land and some form of security of tenure. Typically many areas suffer from inequitable land distribution. They also lack land tenure security or have inadequate land legislation. A general dearth of knowledge is also an issue. All of these factors contribute to risks around food security.

A recent phenomenon in Africa and Asia is acquisition of land by foreigners, sometimes including foreign governments, whereby large tracts of land are being purchased or leased for production of food or biofuel crops. In many cases, these crops are being exported back to the landowner's country of origin (von Braun & Meinzen-Dick, 2009; Cotula et al., 2009). Cotula et al. (2009) note "In many cases land is already being used or claimed — yet existing land uses and claims go unrecognised because land users are marginalised from formal land rights and access to the law and institutions". In such instances, inadequate administration of land rights represents a risk to food security.

Population growth. While population growth rates in Commonwealth countries vary, the dominant trend is upward thus creating competing pressure for land required for a variety of human uses, not least of which is settlement. There are a number of land use trends connected to population growth and environmental factors, as discussed above. The pattern and distribution of human settlement is also a contributing factor. FAO (2009b) predicts that **food production** will need to increase by 70% over the next 40 years in order to feed a future, and more urbanized, world population. The FAO estimates that between 10% and 20% of this increase will need to come from expansion of cultivated lands, the rest from increased yields and cropping intensity. It also identifies potential impediments to the achievement of these targets such as: environmental limitation; failing governments²; weak political will; inadequate policy mechanisms; under-investment; and resistance of citizenry to reforms.

Australia

A 2010 Senate Select Committee investigation into Food Production in Australia concluded the following: Australian governments need to give serious consideration to mechanisms for protecting our most fertile agricultural land from alternative uses in the interests of our long term productive capacity and food security. Source: Senate Select Committee on Agricultural and Related Industries (2010)

4.0 Food Production and Distribution Trends

Conflict between environmental management, food production, and economic growth is one of the biggest threats to sustainable development. This is the result of an increased demand for the utilization of countries' natural resource base that may result in a detrimental effect on the environment and, in certain instances, cause a loss in biodiversity. Ineffective land use planning and limited integration of environmental planning within a comprehensive land use plan is one of the reasons for this scenario (Collett, 2008). Every country must have a sustainable food supply. Continued food production ensures a healthy and prosperous nation and it will also contribute to the country's economic welfare including the continued creation of job opportunities.

Subsidies can also distort international markets related to food production. In the past the United States and European countries have often been identified as being affected by conflicts relating to subsidies as they may lead to oversupply and downward pressure on international markets. The end result of subsidies is a potential impact on domestic agriculture.

Large corporations have become more involved in farming. Farmers often contract commodities at a set price, even before the crop has been planted. These approaches help to limit risk to the farmer, but point to the increasing globalization of the world's food supply, which may present risks to farmers in other countries.

² The 'Failed States Index' (FfP, 2009) provides a ranking of governments' ability to maintain social stability and deliver services to its citizenry. The Commonwealth states of Zimbabwe, Nigeria, Kenya, Pakistan, and Bangladesh are among the 20 worst off on the list.

Canada

Issues of food security are dealt with at the federal, provincial, and community level. The federal government plays a key role related to issues of international trade and on-farm financial support. Increasingly, however, there is also a focus on the local food production and consumption in both rural and urban centres. These local initiatives have increasing support at all levels of government, with strong community backing.

In Canada responsibility for land use planning rests with each of the ten provinces. Each of these provinces have policies and regulations at both the provincial and municipal levels that address rural planning and farmland preservation.

In Ontario, for example, the province has adopted a provincial policy statement, green belt legislation, and other related approaches that are mandated at the municipal level.

Municipally, official plans and zoning by-laws designate and zone agricultural land for agricultural uses. Key areas of production receive special protection, and high capability farmlands are intended to be protected to ensure long-term agricultural use. Despite this there are still pressures for conversion to non-farm uses — both connected to urban sprawl and scattered rural non-farm development.

In developing countries most agricultural production is done through human labour. Production by small scale farmers is often consumed by the farmer's own household. Agriculture is practiced on a small scale, mostly on a piece of land in close vicinity to the farmer's home and in many instances is marginal for agricultural production. Crop selection and production practices are limited. Any surplus the farmer may have is sold to nearby families to generate funds needed to buy seed for a next crop. Agricultural production (food security) in this instance is not sustained but dependent on a number of external factors.

On a commercial level, the farmer employs both permanent and non-permanent seasonal workers to assist in his/her daily farming practices. As agriculture has become more business oriented, farmers apply a more intensive approach to production practices. Sometimes this has created employment opportunities, but many times technology and mechanization have replaced people. As the demand for food increases, farmers have adapted their farming practices to enable them to produce food at sustained high yields.

Farmers, especially in developed countries are farming on a more scientific basis, continuously conducting soil analysis on their lands that will ensure the application of correct amounts of fertilizers and other needed nutrients. Crop selection is based not only on consumer demand but also on the most suitable crop for the area where the farm is located. Each crop is carefully selected based on soil, climate, and terrain characteristics, limiting the possibility of a crop failure. Farmers have also adopted greenhouse production and hydroponics. Genetically modified crops, although also very controversial, have enabled farmers to produce sustained high yields of crops with reduced inputs. These farming practices still rely on fossil fuels that affect transportation costs and carbon footprints.

Available land with agricultural potential is very limited within most countries. In many instances this land has either been lost or is earmarked for other purposes such as development. Land suitable for agricultural production located close to the urban fringe of a town is under stress even though it may be ideally suited for production due to its location. Sometimes there is the temptation to convert environmentally sensitive lands into food production areas. High potential agricultural land needs to be identified and

protected through appropriate legislation to ensure that this land is preserved for current or future production. Effective planning, utilization of available information and the support of decision makers will help to ensure continued food production. Figure 3 provides an example of predicted change in agricultural productivity by 2080. In relation to Figure 3 the following findings of a study by Cline, 2007 should be considered:

Based on a consensus estimate of 6 climate models and two crop modeling methods, assuming a 4.4 C increase in temperature and a 2.9% increase in precipitation, global agricultural output potential is likely to decrease by about 6%, or 16% without carbon fertilization. Cline suggested a range of output potential decline between 10 and 25% among regions. As climate change increases, projections have been made that by 2080 agricultural output potential may be reduced by up to 60% for several African countries, on average 16–27%, dependent upon the effect of carbon fertilization in addition to general water scarcity as a result of melting glaciers, change in rainfall patterns, or overuse. (as cited in UNEP, 2008)

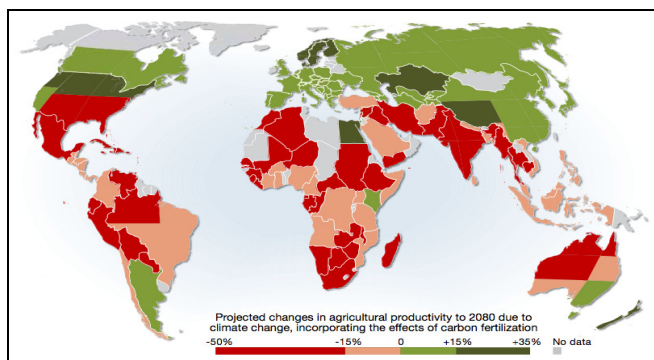


Figure 3: Global projected changes in agricultural productivity 2080 due to climate change, incorporating the effects of carbon fertilization. Source: UNEP/GRID (2008) — Arendal Maps and Graphics Library

5.0 Implications for/and Components of Food Security

Affordable and accessible food for all households is a necessity and the responsibility of government and the broader agriculture community. There are various options available to achieve this goal. One option is increased production by farmers on suitable land using the correct production methods. Another option, for example, is to improve networks of distribution. In developed countries, strategies are likely to be quite different than in developing countries where, for example, the subject in question may be a subsistence farmer who works a hectare or two of land. In a developing country the subject may be an example of large-scale production agriculture where there is optimal utilization of the land's potential and limited potential input costs. Hence, in terms of food security, as well as food affordability and accessibility, it is crucial to protect suitable arable land and encourage sustainable production methods for all subjects involved.

Food systems are at risk more than ever. Significant shocks related to weather, peak oil, and water scarcity have the potential to greatly affect international markets. This may avail benefits to farmers (in terms of international commodity prices), but sometimes there may be severe repercussions for communities. These repercussions are compounded by related environmental issues connected to biodiversity and land degradation. Current models of food production must be re-examined and alternatives sought. Planning for resiliency and the sustainable management of natural resources is increasingly a necessity, but may also represent an opportunity.

The United Nation's (UN) Conference on the Human Environment, held in 1972, pointed out that economic growth will overshoot the Earth's ability to renew and maintain its natural resources. This was emphasized by the fact that the global economic footprint (people's natural resource consumption) in 2001 was 2.2 global ha per person, whilst the productive area of the biosphere was estimated to be an average of 1.8 global ha per person. This means that the Earth's resources are being used up at a rate faster than its resources are being generated (Department of Environmental Affairs and Tourism South Africa, 2006a).

The World Commission on Environment and Development drew the world's attention to the concept of sustainable development with the inclusion of mankind's right to use resources but emphasized a less detrimental effect on the environment. It further stated that unsustainable patterns of production and consumption should be reduced. Priority issues that should receive attention include: biodiversity; the economy; the impact on resource consumption; human vulnerability; food security; land use and productivity; and the overall well-being of people (Aventis CropScience, 2000).

Continued, but economically viable, agricultural production forms the cornerstone for reliable and continued food production. According to Bie, Baldascini, and Tscirley (1996) sustainable agriculture consists of the integration of economic, social, and environmental information in the development and planning processes that will have an impact on net farm productivity.

Sustainable farming practices are necessary. Farming is dependent on the natural resource base of a country for the production of food and, therefore, resources should not be depleted or pushed beyond their limits. To achieve this goal the use of excessive herbicides and pesticides would have to be limited. Additionally, suitable cultivation methods for the land being cultivated would need to be chosen and, also, the non-cultivation of land unsuitable for agricultural production. Correct irrigation practices and

In KwaZulu-Natal, South Africa, "The conversion of agricultural land to non-agricultural uses appears to be driven primarily by financial considerations. Whilst some farmers are genuinely seeking alternate means to augment their incomes, some farmers are finding it more profitable to sell to developers than to continue farming in areas where there is a market for land for non-agricultural activities. Property taxes, the lack of incentives and stock theft are among the reasons cited.

This has raised concern from the Department of Agriculture due to the implications for long-term food security. Although government financial support to established farmers is almost non-existent, some mechanisms have been extended to assist new farmers. Some of these projects have proven to be financially unfeasible and raised concerns around land reform strategies.

Concerns about the implications of the development trends are diverse but generally centred around the potential for permanent loss of the resource. In its role as the protector of the public good, local government is expected to conserve public resources but, due to the pressure to achieve economic growth, decisions are not always made in the interests of long-term sustainability". (Ferguson et al., 2007)

proper soil conservation measures would also need to be implemented. Without these measures the degradation of natural resources will result in a diminished agricultural sector, negatively impacting on food security and the ability of the world's population to feed itself.

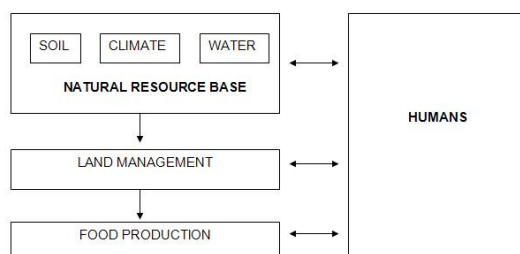


Figure 4: Interaction between humans and the environment Source: Collett (2008)

Intensified support should be given to accessibility of land and its effective utilization support a country's natural resource base. It is very important that effective planning should be conducted to ensure food security. The effective use of natural resources and the management of land and food security should be an integrated process that needs to be balanced and carefully managed (see Figure 4). Strengthening diversity and anticipating changes that may occur is also essential.

6.0 Planning Options / Responses

In order to ensure food security several things need to occur. We need to protect and enhance the current resource base as well we need to develop new, more productive and 'clean' farming technologies, including aquaculture. Additionally, we need to improve the resilience of small-scale farmers and aquaculture systems to exogenous shocks (FAO, 2009c). Planners can have a critical role not only in the preservation of land for food production but, also, in minimizing environmental impacts which may compromise the long-term sustainability of arable land. Environmental issues such as water availability and quality, drought, desertification, climate change and so on are prevalent in both developing and developed countries in the Commonwealth.

There is also a need for increased integration of land and water management, and the reduction of stress on dryland ecosystems. A recent report by the United Nations' Convention to Combat Desertification (2008) supports this position:

Land use changes should be considered where current agricultural patterns are no longer sustainable in terms of water consumption. Conversions of marginal agricultural lands into suitable alternatives, such as forests or grassland, would do much to prevent land degradation and to regenerate long-term farming potential.

This can be achieved through the introduction of alternative livelihoods and the creation of economic opportunities in urban centres and non-dryland areas are strategies

recommended in the Millennium Ecosystem Assessment to combat desertification (Millennium Ecosystem Assessment, 2005).

6.1 Policy Responses and Perspectives of Developed Countries

The traditional policy response to planning for food security has been to implement planning policy and regulation. There is a need, however, to balance these mechanisms with incentives such as economic development initiatives and improvements to farming infrastructure while also encouraging community engagement, communication, and education. The key is to identify and link the three parts in an integrated program, as can be seen in Figure 5, see below.

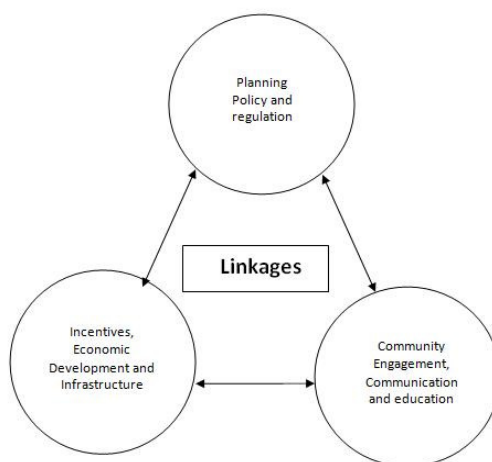


Figure 5: Policy response to planning for food security. Source: Sinclair & Bunker (2007, p. 167)

In some instances provincial, state, and national governments can establish policies to help direct municipal land use decisions. In Canada, for example a number of provincial governments have issued policy statements that are intended to form the basis for municipal decision-making. In turn local plans and by-laws reflect a broader public interest. There is a need to identify the best land for food production (including grazing) and to zone it in such a way to protect it. Zoning and land-use regulations are the principal method of controlling the development of land. Other rural lands may have a landscape character that also needs to be protected.

In the United States incentives, including the purchase and transfer of development rights/credits are implemented. Purchase of development rights or credits can be used where land is declared to be in a preservation zone and kept for agricultural purposes. A farmer can sell the development rights or credits to a government or non-government organization. In return, a covenant is taken out over the land to ensure that the land is used only for agricultural purposes.

This innovative approach to protecting farmland (purchase of development rights) may or may not be applicable in a number of Commonwealth countries. It is important to acknowledge that in the United States property rights are entrenched constitutionally, whereas this may or may not be the case in Commonwealth countries. Where they are not, regulatory approaches may be more effective, and certainly less expensive.

Economic development initiatives are also used to ensure that farming can continue, thereby providing for food security. These initiatives include farm gate sales, agritourism, farmers' markets, local branding, and incentives for farmers to deal directly with restaurateurs.

There is a need to ensure that there is sufficient infrastructure to allow agriculture to continue. This includes water as well as access to: produce stores; farm machinery dealerships; mechanics; transport (road, rail, and air); access to consultants and other professionals as well as a workforce.

There is also a need to engage with the community to make it aware of the importance and benefits of farmland. Connections can be made between urban agriculture and the community. Education is useful in overcoming misconceptions about the idyllic rural lifestyle sought by those moving to the country from urban areas. Restaurants can promote fresh food from nearby sources. Initiatives in agritourism, such as wine and food festivals, are also useful in promoting community awareness of local agricultural production. Community gardens can also be established in urban areas.

An effective policy response to planning for food security requires coordination between all levels of government. It also requires a balance between regulatory tools and educational efforts in addition to broader community and economic support for agriculture. Collectively these responses can make a positive contribution to food security.

6.2 Policy Responses and Perspectives of Developing Countries

Developing countries often face challenges that are different than those faced in developed countries. In many instances the agricultural system is radically different in developing countries in contrast to developed countries, while at the same time the resources of their governments are often limited. The net result calls for different approaches and strategies to effectively plan for food security.

In many developing countries there is a need to ensure equitable access to land. Land policies, for example, are necessary for adequate land administration. An example of this can be found in Zimbabwe where the law system regarding tenure does not recognize rights to land, and, therefore, "all land occupied by Africans was state land" (ECA, 2009). The land policy (1998) of Zimbabwe includes the following stipulations:

- Ensure equitable and socially just access to land;

- Democratize land tenure systems and ensure security of tenure for all forms of landholdings;
 - Provide for participatory processes of management in the use and planning of land; and
 - Promote sustainable and efficient use and management of land.
- (ECA, 2009, p 80)

Equally as important is the need to recognize the very different agricultural systems that often include small-scale producers. Access to information, training, quality seeds, as well as technical knowledge and support, can be invaluable in supporting this important agricultural sector. In this instance food security reflects both the ability of the individual farmer to support his/her family, but also the ability to generate food that can feed the broader community, improving the livelihood system.

Information dissemination can also be critical in stemming unsustainable priorities that can lead to desertification, erosion, and crop failure. In addition, as increasing urbanization consumes agricultural land, broader planning strategies will be required to minimize the disruption to food production.

7.0 Recommendations

This paper's main goal is to raise awareness and to encourage dialogue concerning the importance of planning for food creation and security within the Commonwealth. Its intended audience includes planners, communities, and governments. This paper has identified some differences between developed and developing countries across the Commonwealth, noting the need for different strategies and approaches. Both developed and developing Commonwealth countries have in common: land loss due to land degradation (erosion, loss of fertility, desertification, salinization); and land loss due to urban sprawl and related urbanization. This is a fundamental concern to all Commonwealth countries and their residents. Another common concern for today and the future is the loss of productive capacity and the risk to future production caused by climate change, decreasing productivity associated with peak oil (decreasing availability of relatively inexpensive fossil fuels) as well as the globally uneven distribution of food production capacity and resources.

In this context this paper concludes with the issuance of a "call to action". A call directed to the planning profession but also a call directed to decision makers across the Commonwealth.

A Call to Action

1. **A Broad Definition of Planning.** While the protection of farmland frequently depends on regulation there is much to be gained in pursuing non-regulatory strategies and voluntary action. In developed countries, for example, this includes local development projects supporting a local farmers' market, whereas in developing countries this may include work to profile a new crop or seed variety.

2. Support for Protecting Farmland. Planners and government need to issue strong statements in support of protecting farmland. Requisite policy and legislation are needed in support of these statements.

3. Raising the Profile of Food and Planning. Healthy food is a basic human need (and right) that needs to be recognized and planned for. This includes issues related to the land base, and issues related to access and availability. Whereas, in the past, food and food security issues were often secondary to other planning interests it now needs to be recognized for the role it plays at a local, regional, and national level. The role of urban agriculture, as it relates to urban areas and the peri-urban fringe, also needs to be addressed.

4. Educational Strategies. Planners across the Commonwealth need to develop and implement educational and awareness strategies related to the loss of farmland and land degradation. Educational strategies can help to ensure better decision-making, and contribute to an informed and engaged community (including both farm and non-farm interests).

5. Awareness and Regulations. Planners should also be aware of the appropriate regulatory procedures and tools. These tools will vary by country. In some contexts regulation will be difficult, whereas in other situations it will be a key tool helping to guide urban development and limit residential sprawl — urban and rural residential. Countries need to demarcate/zone areas suitable for food production based on the land's potential and this needs to be made public to all involved role-players for incorporation into all planning tools or strategies.

6. Planning for the Future. Threats to food production largely connected to climate change and decreasing supplies of fossil fuels will make some areas more productive and even more areas less productive. Equatorial regions and areas prone to dryness are likely to suffer a loss in productivity while temperate regions may gain. Decreasing supplies of relatively inexpensive fossil fuels, however, are likely to threaten productivity levels in those countries with a high dependency on their use.

7. Recognizing “One Size Does Not Fit All”. The issues and needs related to food security vary across the Commonwealth. The needs of one country may be quite different than the needs of another country. Likewise, the applicability of regulatory and non-regulatory strategies will vary.

8. Sustainable Agriculture. Agricultural practices can be inherently sustainable and renewable or inherently unsustainable, leading to land degradation and loss of productive capacity. Long-term food security across the Commonwealth will depend on successfully encouraging sustainable practices and discouraging non-sustainable approaches to agricultural production.

9. Research. Documenting the Magnitude of the Issue. Further research is needed to document the magnitude of this issue in individual countries and across the

Commonwealth. The authors encourage research on the points that have been identified within this paper and note a relative lack of information and statistics on topics such as land loss or land tenure and suggest this is a robust area for future research.

Monitoring Evolving Trends. There are a variety of issues that will affect the future of food security across the commonwealth. Climate change and peak oil have been mentioned, but international markets and tenure security can equally play an important role. The challenge in the decades ahead will be to monitor these trends, helping planners, citizens, farmers, and communities to adapt.

10. Role of the Commonwealth Association of Planners. Networks and Food Security. For many Commonwealth countries, the Commonwealth Association of Planners can be an important organization that can help to share information and develop networks related to planning for food security.

Sharing Strategies and Best Practices. Commonwealth planners can learn much from each other. The Commonwealth Association of Planners can play a role helping planners to share strategies and best practices.

Authors' Biographies

Wayne Caldwell Is a Professor in Rural Planning at the University of Guelph in Ontario, Canada. He also has a career long affiliation with the County of Huron Department of Planning and Development. Wayne served as President of the Ontario Professional Planners Institute from 2007-2009, as Chair of the Ontario Rural Council (1999-2003) and is currently President of the Association of Canadian University Planning Programs. His primary focus has been on planning and change in rural and agricultural communities. He is an active researcher in the area of farmland preservation, rural conflict resolution, governance of nutrient management and community based approaches to economic and environmental issues. His books include "Doing Democracy with Circles: Engaging Communities in Public Planning" (2010) and "Farmland Preservation: Land for Future Generations" (2007).

Anneliza Collett Is an Assistant Director within South Africa's Department of Agriculture, Forestry, and Fisheries within the Department's directorate: Land Use and Soil Management. She is responsible for the development and management of spatial information (geo-graphic information data sets and decision support systems) pertaining to natural resource management, the status thereof as well as the demarcation and protection of agricultural land. Part of her responsibilities include supplying technical advice and support to land use managers as well as the review of Integrated Development Plans, Spatial Development Frameworks and Environmental Management Frameworks. She is also involved in the compilation of guidelines for the management of agricultural land and the review of agricultural potential studies. Anneliza has been trained as a natural resource specialist. She has a M.Sc. degree wherein her thesis focused on the demarcation and protection of agricultural land within the South African context, with special focus on the Gauteng province.

Therese Ludlow Is a Master's Student at the University of Guelph in the Rural Planning and Development Program. Working alongside Dr. Wayne Caldwell on this paper, her interests lie in Program Evaluation and Project Development. Her research focuses on Foreign Land Acquisition and Tenure Security surrounding food security issues in developing countries.

Ian Sinclair, Principal Consultant, EDGE Land Planning. Ian is a Principal Consultant with Edge Land Planning, a consultancy specializing in rural strategic planning for Local and State Government. Ian has 25 years experience working in rural areas — in Local Government as well as consulting. He specializes in strategic planning for rural and metropolitan fringe Councils, having done work in more than 30 Council areas across NSW and Queensland. With a degree in Town Planning and a Certificate in Economic Development from the Indiana Economic Development Institute Ian is also a Fellow of the Planning Institute of Australia and Member of the American Planners Association. He has taken part in 12 study tours of Canada and the United States looking at Rural Planning, Economic Development, and urban Issues. As well Ian is a regular speaker at conferences in Australia, the United States, and Canada in addition to being a part time lecturer in Rural Planning matters at the University of NSW, Faculty of the Built

Environment. He is also a guest lecturer at a number of other Universities in Australia, Canada, and the United States on Rural Planning and Economic Development Issues. Ian also authored the “Rural Planning” chapter in *Planning Australia — Issues for Urban and Regional Planning* (2007; edited by Associate Professor Susan Thompson of the Faculty of the Built Environment at the University of NSW).

Jenny Whitehead Is a sustainable environments consultant at *iRAP* in Cape Town, South Africa. Jenny has worked for 25 years mainly in private practice working primarily with local, provincial, and national government agencies. Jenny also worked six years as a staff consultant in a quasi-governmental development agency. She has resisted the limitations of sector-based practice and opted to pursue a broad, trans-disciplinary interpretation of sustainable development and land use management. Jenny contributed to the research and drafting of policy guidelines for management of agricultural lands in the KwaZulu-Natal Province of South Africa.

Appendix A

Commonwealth countries. There are 54 countries of the Commonwealth:

Antigua and Barbuda	Mozambique
Australia	Namibia
The Bahamas	Nauru
Bangladesh	New Zealand
Barbados	Nigeria
Belize	Pakistan
Botswana	Papua New Guinea
Brunei Darussalam	Rwanda
Cameroon	St Kitts and Nevis
Canada	St Lucia
Cyprus	St Vincent and the Grenadines
Dominica	Samoa
Fiji Islands	Seychelles
The Gambia	Sierra Leone
Ghana	Singapore
Grenada	Solomon Islands
Guyana	South Africa
India	Sri Lanka
Jamaica	Swaziland
Kenya	Tonga
Kiribati	Trinidad and Tobago
Lesotho	Tuvalu
Malawi	Uganda
Malaysia	United Kingdom
Maldives	United Republic of Tanzania
Malta	Vanuatu
Mauritius	Zambia
	*Gibraltar

Source: <http://www.commonwealthfoundation.com/Aboutus/TheCommonwealth/Commonwealthcountries>

*Associated Member

References

- American Planning Association. (APA). (2007). *Policy Guide on Community and Regional Food Planning. Final Policy Guide*. Retrieved from: <http://www.planning.org/policy/guides/adopted/food.htm>
- Aventis CropScience. (2000). Rio Declaration on Environment and Development. (PowerPoint presentation), Berlin, DE: Technology Strategy and Resources.
- Budge, T., Thompson, L., Black, J., Cover, S. (2009). Integrating Land Use Planning and Community Food Security A New Agenda for Government to Deliver on Sustainability, Economic Growth and Social Justice. *Agenda*, October, 1–76.
- Bie, S. W., Baldascini, A., & Tscirley, J. B. (1996). The context of indicators in FAO land quality indicators and their use in sustainable agriculture and rural development. Proceedings of the workshop, 25–26 January 1996. *FAO Land and Water Bulletin*, 5, Rome, IT: Food and Agricultural Organization.
- Caldwell, W., Hilts, S. & Wilton, B. (2007) *Farmland Preservation: Land for Future Generations*. Canada. 343–363.
- Clapp, J., Cohen, M. J. (2009). *The Global Food Crisis: Governance Challenges and Opportunities*. Waterloo, ON: Wilfred Laurier University Press.
- Collett, A. (2008). *The Determination, Protection and Management of High Potential Agricultural Land in South Africa with Special Reference to Gauteng*. Unpublished M.Sc. thesis. Pretoria, SA: University of Pretoria.
- Commonwealth Foundation. (2010) The Commonwealth Countries Retrieved from: <http://www.commonwealthfoundation.com/Aboutus/TheCommonwealth/Commonwealthcountries>
- Commonwealth Secretariat. (2010). *The Commonwealth*. Retrieved from: http://www.thecommonwealth.org/Internal/191086/191247/the_commonwealth/
- Cotula, L., Vermeulen, S., Leonard, R., & Keeley, J. (2009). *Land Grab or Development Opportunity? Agricultural Investment and International Land Deals in Africa*, London, UK: IIED, Rome, IT: FAO, Rome, IT: IFAD.
- Daniels, T., & Bower, D. (1997). *Holding Our Ground*, Washington, DC: Island Press.

- Department of Environmental Affairs and Tourism. (2006a). *South Africa Environment Outlook: A Report on the State of the Environment*. Pretoria, SA: Department of Environmental Affairs and Tourism.
- Economic Commission for Africa. (ECA). (2009). *Land Tenure Systems and Their Impacts on Food Security and Sustainable Development in Africa*. Addis Abba, ET: Economic Commission for Africa. Retrieved from: http://www.uneca.org/eca_resources/publications/sdd/land_tenure_systems.pdf
- Emerson, C., & Wallis, M. (2003). *Sustainable Agriculture in the Commonwealth: The Challenge. Sustainable Agriculture, Sustainable Life*. Commonwealth Business Council: Publications. Retrieved from: http://www.unilever.com/Images/Sust_Ag_Sust_Life_tcm3-11410_tcm13-5326.pdf
- Ferguson, C., Whitehead J., von Riesen, A., Naidoo, N., Ralfe, K., & Briginshaw, D. (2007). *Guidelines to assist in the Management of Development Pressure in Agricultural Areas or Areas with Agricultural Potential*. Pietermaritzburg, SA: KwaZulu-Natal Provincial Planning and Development Commission.
- Food and Agricultural Organization of the United Nations. (2006). *Food Security*. Policy Brief, June, Issue 2. Retrieved from: ftp://ftp.fao.org/es/ESA/policybriefs/pb_02.pdf
- Food and Agricultural Organization of the United Nations. (FAO). (2009a). *Food Security and Agricultural Mitigation in Developing Countries: Options for Capturing Synergies*. Retrieved from: <http://www.fao.org/docrep/012/i1318e/i1318e00.pdf>
- Food and Agricultural Organization of the United Nations. (FAO). (2009b). World Summit on Food Security, Rome, November 16–18, *Background Paper — Feeding the World, Eradicating Hunger*. Retrieved from: <ftp://ftp.fao.org/docrep/fao/Meeting/018/k6077e.pdf>
- Food and Agricultural Organization of the United Nations. (FAO). (2009c). *Land Tenure and Rural Development*. Chapter 3. What is Land Tenure? Retrieved from: <http://www.fao.org/docrep/005/y4307e/y4307e05.htm>
- Fund for Peace.(FfP) (2009). *Failed States Index*. Retrieved from: <http://www.fundforpeace.org/web/index.php>
- Millennium Ecosystem Assessment. (2005). *Ecosystems and Human Well-being: Desertification Synthesis*. Washington, DC: World Resources Institute. Retrieved from: <http://www.maweb.org/documents/document.355.aspx.pdf>
- Ontario Professional Planners Institute. (OPPI). (2007). Healthy communities sustainable communities: A call to action. *Ontario Planning Journal*, 22(6), 3–5.

- Senate Select Committee on Agricultural and Related Industries. (2010). *Select Committee on Agriculture and Related Industries: Food Production in Australia. Final Report*, Canberra, AU: Senate Printing Unit, Department of the Senate, Parliament House. Retrieved from http://www.aph.gov.au/Senate/committee/agric_ctte/food_production/report/c02.htm
- UNEP/GRID-Arendal Maps and Graphics Library (2008). *Projected Agriculture in 2080 Due to Climate Change*. Retrieved from: <http://maps.grida.no/go/graphic/projected-agriculture-in-2080-due-to-climate-change>
- Pothukuchi, K. (2004). Community food assessment: A first step in planning for community food security. *Journal of Planning Education and Research*. 23, 356–377.
- Royal Town Planning Institute (RTPI). (2010). *Planning for Food*. Retrieved from: <http://www.rtpi.org.uk/download/5248/Rural-Planning-Network-Think-Piece-on-Food.pdf>
- Runge, C. (2003). *Sustainable Agriculture in the Commonwealth: The Challenge*. *Sustainable Agriculture, Sustainable Life*. Commonwealth Business Council: Publications. Retrieved from: http://www.unilever.com/Images/Sust_Ag_Sust_Life_tcm3-11410_tcm13-5326.pdf
- Shah, M., & Strong, M. (2000). *Food in the 21st Century: From Science to Sustainable Agriculture*. Washington, DC: The World Bank.
- Sinclair, I. (2002). Sustainable Growth Management for Sydney: The Issues, New Planner, No. 53, Sydney, AU: Planning Institute of Australia NSW.
- Sinclair, I., & Bunker, R. (2007). Planning for Rural Landscapes. In S. Thompson (Ed.), *Planning Australia: An Overview of Urban and Regional Planning*, Melbourne, AU: Cambridge University Press.
- Sneddon, J. (2009). Climate Change, Agriculture and Trade Prospects for Developing Countries. Trade hot topics. *Commonwealth*, Issue 61, 1–8.
- Taylor-Cole, W. (2010). Food Sovereignty. Is it Achievable? *Public Sector Management*. 21(3).
- United Nations Convention to Combat Desertification. (UNCCD). (1994). United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification Particularly in Africa. Geneva, CH: United Nations Environment Programme. Retrieved from:

<http://www.un.org/millennium/law/xxvii-25.htm>

United Nations Convention to Combat Desertification. (UNCCD). (2008). Fact Sheet 11: *Combating Desertification in Africa*. Retrieved from:
<http://www.unccd.int/publicinfo/factsheets/showFS.php?number=11>

United Nations Environment Programme. (UNEP). (2008). *Impacts on Environmental Degradation on Yield and Area*. Retrieved from:
<http://www.grida.no/publications/rr/food-crisis/page/3567.aspx>

Von Braun, J., & Meinzen-Dick, R. (2009). "Land Grabbing" by Foreign Investors in Developing Countries: Risks and Opportunities. Policy brief 13. Washington, DC: International Food Policy Research Institute.(IFPRI)

World Food Summit Declaration and Plan of Action. (1996). *Rome Declaration on World Food Security*, Italy. Retrieved from:
<http://www.fao.org/docrep/003/w3613e/w3613e00.HTM>

Wiebe, K., (2003). *Linking Land Quality, Agricultural Productivity, and Food Security*. USDA-ERS Agricultural Economic Report No. 823. Retrieved from:
<http://ssrn.com/abstract=757869>

Wright, R. (2004). *A Short History of Progress*. New York, NY: Carroll and Graf Publishers.