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**Faced with today's food and energy crisis how can society improve its wellbeing?**

Society needs a new green revolution. The first 'green revolution' began in the mid twentieth century. It involved the application of fossil fuel based energy, machinery, and agricultural chemicals to dramatically increase food production. This fueled economic growth, that led for the most part to increased material wealth, which was equated with social wellbeing. The substantial negative environmental and social impacts of the first green revolution have become unacceptable. We need a second 'green revolution' driven at a grassroots level by local communities, supported and maintained at an institutional level by business, government and non-governmental organisations. This new 'green revolution' is not only possible – it is essential.

Food production and fossil fuel based energy have become inextricably linked. Energy consumption and social wellbeing have also become linked, in terms of material wealth and consumption being measured as a summation of social wellbeing. In order to improve the wellbeing of society now and in the future these linkages need to be decoupled. Agriculture needs to become progressively non-reliant on fossil fuel energy. Social wellbeing needs to be examined not just in terms of gross domestic product – but within a more holistic framework that includes factors such as access to environmental goods like clean air and water, community health, work-life balance and sustainable consumption patterns. The concept of a new 'green revolution' represents a food production system that is primarily local, vibrant and flexible. It is also environmentally and socially sustainable, in line with the classic Bruntland definition: meeting the needs of this generation without compromising the ability of future generations to meet their own needs.

The largescale industrial systems that produce most of our food are costly in terms of negative environmental impacts and social wellbeing. Crops are often grown in large-scale monocultures, which are highly susceptible to disease and pests. This leads to an increased input of fossil fuel based pesticides. Soil that is intensively farmed and treated with petroleum based chemicals rapidly loses fertility, thus requiring further input of fertilisers. Over time this has a detrimental impact on soil and water quality, and can affect the nutritive quality of the food itself. Agricultural run off can damage aquatic eco-systems, as seen in many places by declining water quality and aquatic life. Extensive irrigation can lead to the salinisation of land and the depletion of ground water reservoirs. Food is often transported vast distances from where it is grown. As peak oil approaches and an energy crisis looms this system is fast becoming unaffordable. Globally, the impacts of climate change are a pressing reality. Scientific consensus contends that climate change is primarily anthropogenic, resulting from the burning of fossil fuels. A substantial way to reduce global fossil fuel usage is to utilise food production systems that do not rely on this form of energy. Many food producers, particularly in the global south or third world, are heavily dependant on international markets. This dramatically impacts the wellbeing of farmers when world commodity prices fall. Where subsistence farming has been abandoned in order to pursue 'cash crops' for export, a valuable supply of local food ceases. Where food production relies heavily on seasonal and migrant labour, flagrant abuse of agricultural workers rights have been recorded.

A number of viable alternatives exist to today's main industrial food production system. Organic farming systems provide biologically diverse environments and sustainable inputs, without the negative environmental impacts of conventional agriculture. City

farms indicate that urban land use can be highly efficient when put into growing food, thereby reducing food transportation distances for urban areas. Community gardens, allotment farming systems, backyard or rooftop gardening can provide a significant amount of a household's food. Organic food production relies less on mechanised production and more on human labour. In terms of providing employment for people this can be seen as a positive factor. Streamlining food production systems can reduce wastage and reduce necessary inputs. Utilising rainwater and 'grey' water can cut down on irrigation needs. Using composting, crop rotation, companion planting, shelterbelts and other ecologically based production methods reduce or cut out the need for fossil fuel based inputs, and increase sustainable outputs from food growing land. Labour standards and food production are more visible and more easily regulated when food is grown 'close to home'. The wellbeing of agricultural workers should be a central aspect of sustainable food production.

Underlying this whole transition is a redefinition of wellbeing. Governments and societies need to define wellbeing, not only in terms of gross domestic product, but by meaningful community interactions, physical and mental health, creative activities, and the ability of the environment to provide services such as clean air and water. Food production systems are vital to addressing environmental problems such as soil degradation, water pollution and climate change. A reduction in fossil fuel based material wealth, linked to lengthy working hours in a central urban area, can lead to time-rich societies instead. The concept of being 'time-rich', and reduced hours of paid employment, means that growing one's own food becomes a more realistic option. Locally produced food is transported shorter distances and profits go back into local communities. Instead of an industrial, fossil fuel dependent way of producing food, many different locally appropriate systems can be utilised. Long-term environmental health needs to be valued in a way that encourages changes from consumption driven lifestyles toward sustainability.

Society already contains within itself important tools for improving social wellbeing and transitioning to sustainable food production. The Internet is an incredible information resource, providing food growing information and helping people to pool resources and form networks. Internet based social movements provide people with the conceptual tools to improve social and environmental health. Education gives people the knowledge and skills to understand the link between environmental wellbeing and food production, and to learn practical methods of food production. Many people possess significant knowledge of how to grow food within their own regions. This information can be passed on through families, neighbours, and friends. Consumer demand for sustainable food helps to support this transition. Retailers are recognising and responding to consumer demand for ethically and environmentally responsible produce. It is crucial that sustainable systems are supported at an institutional level. Land use zoning, regular farmer's markets, food trees in public spaces, education, food import and export policies, subsidies, and food labeling standards are examples of local and national level action that support sustainable food production. Political pressure from society on relevant institutions can help bring about these kinds of changes. The seeds of a vibrant healthy and green society already exist. We need to water them, value them and provide the conditions in which they can grow.