FutureDirections international

INDEPENDENT STRATEGIC ANALYSIS OF AUSTRALIA'S GLOBAL INTERESTS

FDI Feature Interview

16 August 2016

# Vision Infinity for Food Security: Dr Shashi B. Sharma

**Key Points**

- The issue of global food security and the consequences of its absence are becoming more pressing.
- New paradigms are needed and old ones need to be discarded if food insecurity is to be avoided.
- Comprehensive initiatives are needed to achieve a fundamental change in how we think we can produce food without damaging the natural ecosystem, how we can protect it from loss and how we can provide it without exposing the environment and people to health and safety risks in a growing global economy.
- Time limited visions for food security may represent flawed and myopic thinking. Vision infinity for food security, that is food security for all forever, is mandatory.

## Introduction

In the introductory abstract to *Vision Infinity for Food Security*, (Sharma and Wightman 2015), co-author Dr Shashi Sharma draws our attention to the 1798 prediction by Thomas Malthus that human kind's ability to feed itself was limited by population size. Malthus foresaw a time when human numbers would exhaust the capacity of planetary food producing resources with catastrophic consequences. After all, a secure food supply is essential for species survival.

Food security can be defined as ensuring that all people, at all times, have both physical and economic access to the basic food that they need or, put more simply, for each individual to have sufficient food, each day, to provide the nutrients and energy to maintain a healthy and active life.

The book calls for a fundamental and philosophical re-thinking and re-structuring of our food production, distribution and consumption.

FDI has taken the opportunity to interview Professor Sharma about his book and his vision for a world perpetually free from food insecurity; that is, food security for all forever.

**Interview**

**FDI**: *In your recently published book **Vision Infinity for Food Security**, you provide a most interesting analysis about food security, suggesting that present-day and proposed agricultural practices are unsustainable and will not meet future food demands. How do you arrive at this alarming conclusion?*

**SS**: Humans have come a long way since the advent of agriculture and made unbelievable achievements, particularly in the last 200 years - from electricity in the1870s to the World Wide Web in early 1990s. The wealth of this world has steadily grown to over US$ 260 trillion. This remarkable progress is, unfortunately, accompanied by widespread and ongoing destruction through over-exploitation of our natural environment and pollution of all kinds that are impacting on the climate of this planet. As a consequence, land and water resources needed to produce more food are already overstretched. There is practically no more land that can be released for food production without creating further irreversible challenges to world biodiversity and without converting land that is dedicated to forests. Freshwater and marine food-stocks are as challenged as land based food production systems.

A hunger epidemic is widespread with about two billion food insecure people who are starving and suffering from malnutrition. In about 80 years there will be five billion additional mouths to feed. As such, the world population is getting older and, in less than 100 years about 80 per cent of the people with median age over 40 years will be living in urban environments. Making plans and arrangements to provide safe and nutritious food to all should be the number one global priority of the century.

It will not be just a simple matter of opening up more land, growing more crops and breeding more livestock. Deserts are expanding and new pests are emerging and spreading uncontrollably, thereby putting more pressure on food production systems. Degradation of soil quality and health is affecting almost all countries. Soils are being abused and eroded at rates that are orders of magnitude greater than the soil renewal mechanism can compensate. Recent reports reveal that we are losing about 24 billion tonnes of fertile soil per year. Not only is soil quality and health declining due to over exploitation but bees are dying world-wide for no single, verifiable reason. Biosecurity breakdowns are already debilitating but can only get worse. Water tables are falling worldwide and aquifers of some of the grain producing countries - China, India and USA, which together produce one half of the world's grain - are rapidly being depleted.

The environmental cost of meeting the growing food demands of people is increasingly becoming unaffordable. Unfortunately, someone, somewhere on this planet, has to pay for the damage being caused to the natural resources and the environment in general. Is there a shifting of cost by the present generation onto the future generations?

There is a distinct lack of long-term vision and plans for achieving global food security. If this serious matter is not given due attention, it is not hard to foresee that war may result with people migrating and rebelling for access to food, land and natural resources.

**FDI**: *What needs to be done if we are to avoid the catastrophic outcomes we face if present practices and attitudes are maintained?*

**SS**: Comprehensive initiatives are needed to achieve a fundamental change in how we think we can produce food without damaging the natural ecosystem, how we can protect it from loss and how we can provide it without exposing the environment and people to health and safety risks in a growing global economy.

It is crucial that the global food production system must not compromise the long term productive capacity of land and water ecosystems. This includes the urgent development of a global action plan for sustaining 12 billion people in 2100. It would help if the holistic, sustainable food value chain approach was incorporated into all future development projects. The food and agriculture sector has generally lagged behind in technology adoption and this must change. Improving the efficiency of the food value chain with technological and market innovation that enables billions of smallholder farmers would be a giant leap. Technology-intensive agriculture for small and large holder farmers, where all major activities in the value chain are mechanised and can be remotely operated, could be one of the options to create highly efficient value chains.

Food production practices and technologies must maintain the productive capacity with a negligible degradation impact on the environment and biodiversity. If there is any degradation, there should be a built-in mechanism to repair the system and reinstate productive capacity. This would require the transformation of conventional agriculture to eco-agriculture and a transformation from a producing "more food" to a "sustainable food" supply processing approach.

As a start, global adoption of a 3Ps strategy - **Produce** food sustainably; **Protect** food from loss in the value chain; and, **Provide** bio-secure, safe and nutritious food – is mandatory if food security for all, forever is to be achieved.

**FDI**: *Do you believe that the scientific community is sufficiently engaged to consider the research required? And if not, what needs to be done? What would you describe as the priority areas for research?*

**SS**: Global large-scale food production systems and their underpinning research activities are heavily skewed towards producing more food but not necessarily in a sustainable manner. There is a need for corrective action to renovate agriculture of 20th century. The research spectrum must continue to expand from mainly production to include research on other components of food value chain. Not losing food is as important, if not more so than producing more food sustainably.

Our planet has more water than land and yet we suffer from water shortages. We should expand our water dependence to include ocean water for food production. This includes much greater attention to biosaline agriculture to develop food production systems for saline environments by harnessing the potential of plant species that have inherent ability to grow under saline conditions.

About 70 per cent of our planet is covered with water and about 98 percent of this water is in the oceans. This water evaporates and travels through the air, rains down on the land and then flows back to the ocean. There is need for research and innovation to understand the craft of rain making and develop an ability to create rain as and when and where needed. Drought prone rain-dependant agriculture presently constitutes 80 percent of global agriculture.

During the history of agriculture, humans have learnt the science and art of domestication and the production of plants for feed and food. This capability has enabled us to feed seven billion human beings across regions and continents. Now the focus has to be on microbes, particularly the soil microbes, to gain a proper understanding and knowledge of global soil microbial systems and use this knowledge to enhance sustainability and to achieve food security for present and future generations. It is estimated that at least half of the living biomass on the planet is microbial yet probably less than 0.1 percent has been characterised. Soils are extremely important as a carbon sink and vast accumulator of organic carbon, much more than Earth's

atmosphere and all the plants on the planet. Research investments in soils in general, and soil biology in particular, must be increased.

Renewable energy sources are mandatory. The energy dependence of food system should be entirely on renewable sources. Solar energy, a freely and widely available resource, remains grossly under used. There is excellent scope for much greater use of solar energy along the food value chain from growing plants and animals more efficiently to drying crops, heating storage structures, generating electricity and making the value chain more efficient.

There is urgent need to optimise the efficiency of the global food system. Food is lost all along the value chain from farm to fork. About 33 per cent of the current global investment into food production is wasted while, at the same, time about two billion people suffer from hunger and malnutrition. Development of food loss minimisation and effective food waste utilisation plans are needed for all countries, including a cultural shift towards prevention of food waste at the consumer level.

**FDI**: *What role do policy makers (the politicians and public servants who design and implement policies) need to play to change our present outlook and attitude to deal with the future?*

**SS**: Long term vision has been missing from our food security planning and inter-generational perspective. Globally, policymakers appear to have adopted a problem solving approach to address food insecurity. This would be an acceptable approach if the focus is on solving problems before they arise. We are developing short-term visions – Vision 2020, Vision 2030 and so on. These visions generally define key problems and develop goals to address these problems and may even succeed in solving them. These processes, however, create new sets of problems and then again develop new vision statements to address these problems and thus continue the cycle. In fact, these problems should not have emerged if 'foresight', 'long-term vision' and 'wisdom' were primary planning tools and drivers for feeding the human population.

Political leaders should not only fix problems after they have manifested but must endeavour to envision and take lead in preventing problems from happening. This is difficult as there may be little recognition or accolades for the solutions to problems that were avoided or resolved before their manifestation. There is a distinct need for change in mentality to the effect that we get out of the problem solving modality and move straight into the problem prevention mode. 'Politically correct', 'smart' and 'clever' initiatives must be underpinned by a long-term vision, particularly when planning for food security for all forever.

Time limited visions for food security may represent flawed and myopic thinking. We have proposed a *Vision Infinity for Food Security*; that is, food security for all forever. A clear mission and plan is fundamental to achieve this. Perhaps it would help if we looked back and assessed performance of our food and agriculture sector in relation to other sectors during the past at least 10,000 years to identify what worked, what did not, what were the game changers, what lessons we can learn, and then looked forward to create a food and agriculture mission for 1000 years, plan for 100 years with goals for 10 years. It would be difficult to think and create a mission for 1000 years when we have life span of about 100 years when global governance and management systems and even our outlooks are geared towards short-term envisioning. We need to meet this challenge head on and as a priority. Global politicians and public servants must take the lead. It is a change in approach, attitude, strategy and vision that is required.

Active community engagement is vital to ensure a long-term perspective of food security initiatives worldwide much beyond the political election cycles. The gradual emergence of civil society as an important voice in food security related decision-making and global governance is an encouraging development. The civil society, as a representative of interests of the community

at large, must be the custodian of long-term vision. They must take responsibility for ensuring that the direction that elected and appointed leaders take, and resources they expend, are consistent with the vision and mission of food security for the present and future generations. Civil society must hold the political system, governments, private sector and academia to account, measuring consistency of their plans and actions with a global food security vision.

**FDI**: *How can the public be approached to accept the seriousness of the global food situation and be convinced of the need to advocate change?*

**SS**: It is crucial that the global community fully understands the power of its decisions on what to eat, when and what to buy and not to buy. This determines what food will be produced and traded. Public understanding of the food value chains and awareness of food security issues are a must to encourage greater involvement in the process, promote an understanding of how expensive the process is, and the implications of losing or wasting food. The Japanese initiative of Shokuiku (food education) has merit for consideration by the global community for enhancing awareness and knowledge about food - how it is produced, from where it comes and consequences of wasting food and not eating balanced nutritive diet, and so on.

The Shokuiku concept seeks, among other outcomes, to have people develop a greater appreciation for understanding dietary outcomes, including the roles played by the natural environment and the people who produce, transport and prepare food. It seeks to engage parents, educators and day-care providers in order to actively promote Shokuiku among children be it at home or at schools or in the community generally. In so doing, it seeks to actively promote an awareness and appreciation of traditional food culture and an interaction between food consumers and producers, thus promoting people's health in body and mind and thus enriching human lives.

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**About the Interviewee**:

Dr Sharma is Director of Plant Biosecurity at the Department of Agriculture and Food Western Australia. He was on a 3-year secondment (Feb 2013 to Jan 2016) to Murdoch University in Western Australia as Professor and Chair in Biosecurity and Food Security. He has been internationally working in the food and agriculture sector for the last about 40 years and has served on several committees including the national Plant Health Committee and Participants Committee for the Cooperative Research Centre for National Plant Biosecurity in Australia. Chairman of three Western Australian plant industry committees: Grains Industry Biosecurity Committee, Horticulture Industry Biosecurity Committee, and the Bee Industry Consultative Committee. He has served as Principal Consultant, Team Leader and Director for international programs of AGWEST International, Department of Agriculture and Food for providing advice to countries and regions and capacity enhancement in the area of biosecurity risk management. He has highlighted the importance of biosecurity risk management to achieving global food security.

He has had a number of senior roles and appointments including: Director of Australia-China Joint Centre for Abiotic and Biotic Stress Management in Agriculture, Horticulture and Forestry – a joint initiative between Murdoch University and the Northwest Agriculture and Forestry University, China; Co-chair of WA Zero Food Waste Group Program Leader, Safeguarding Trade Program of the Cooperative Research Centre for Plant Biosecurity, Australia.

Head and Professor of the Division of Nematology, the largest nematology centre in the world, located in New Delhi, India; Member of the Academic Council of the Post Graduate School and Chairman of Board of Studies; Member of national Scientific Advisory Panel of Crops Program of the Indian Council of Agricultural Research.

Senior Scientist at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT); Coordinator, area-wide insecticide resistance management project, ICRISAT Representative for the CGIAR System-wide Integrated Pest Program; Visiting Professor at the Delta Centre of the University of Missouri USA while on sabbatical from ICRISAT; and International Fellow at the Rothamsted International, United Kingdom. He is author/co-author of over 200 publications mainly in agriculture protection including three books. Professor Sharma is recipient of a number of awards in recognition of his contributions made to agriculture including 'Excellence in Science' award of the Consultative Group on International Agriculture Research (CGIAR).

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*Any opinions or views expressed in this paper are those of the individual interviewee, unless stated to be those of Future Directions International. The views of the interviewee are his personal view as author of the book and are not of his current and past employers.*

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80 Birdwood Parade, Dalkeith WA 6009, Australia.
Tel: +61 8 9389 9831 Fax: +61 8 9389 8803
E-mail: info@futuredirections.org.au
Web: www.futuredirections.org.au