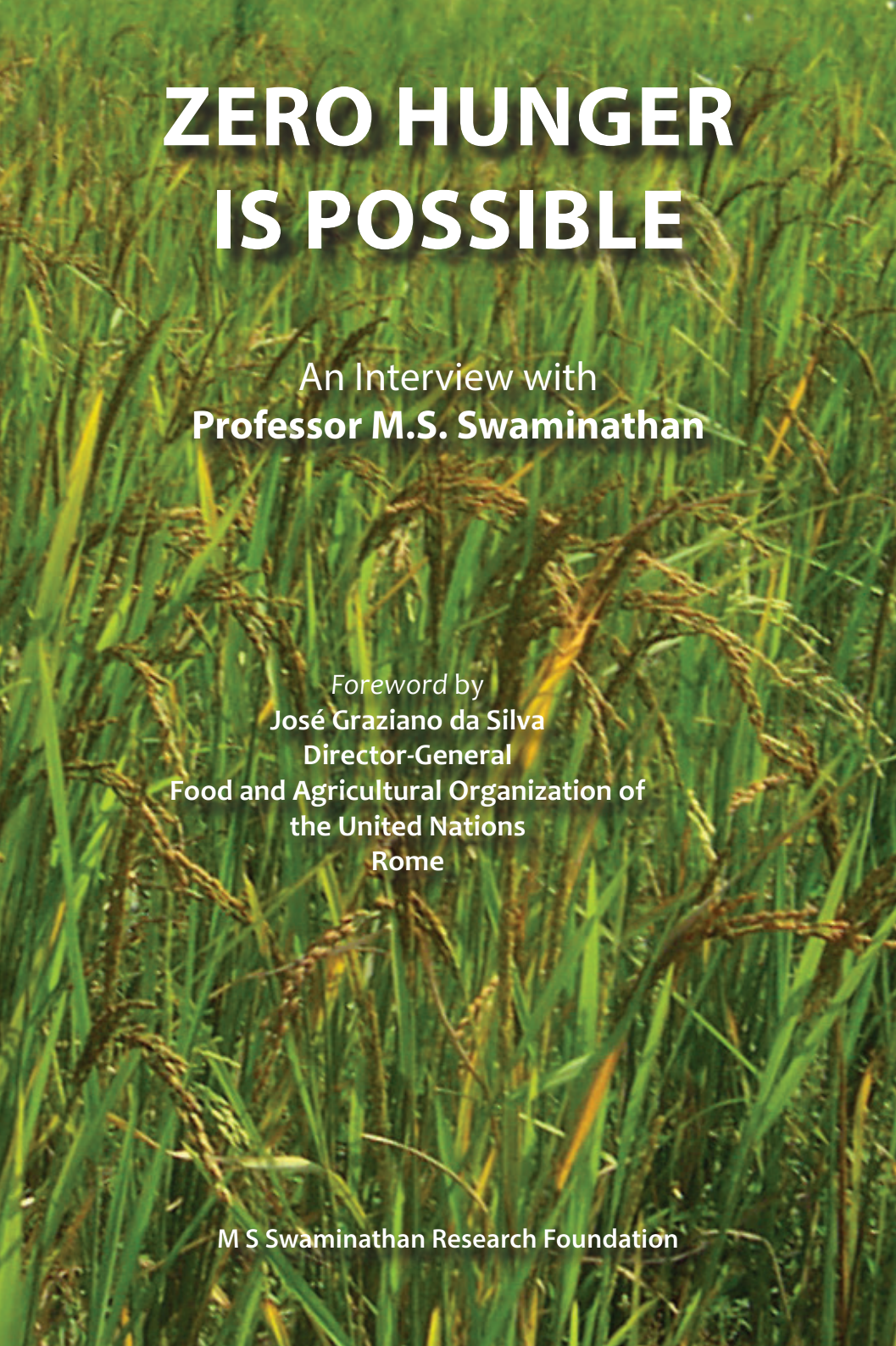

ZERO HUNGER IS POSSIBLE

An Interview with
Professor M.S. Swaminathan

Foreword by
José Graziano da Silva
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MSSRF/OP/14/3

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FOREWORD

The name of Professor M.S. Swaminathan has been closely associated with the efforts to increase agricultural production and food security for well over 50 years. Professor Swaminathan is widely recognised as the main architect of India's Green Revolution and has played an unparalleled role in India's policy making on food and agriculture for decades. Together with the late Professor Norman Borlaug, Professor Swaminathan is rightly considered one of the pioneering leading lights in the field of food and agriculture worldwide.

Over the years, Professor Swaminathan has also worked closely with the Food and Agriculture Organization (FAO) of the United Nations. As Independent Chairman of the FAO Council between 1981 and 1985, he played a key role in establishing the Commission on Genetic Resources for Food and Agriculture. In 1987 he received the first World Food Prize and in 2009, he became the first chairperson of the Steering Committee of the High Level Panel of Experts on Food Security and Nutrition (HLPE) of the Committee on World Food Security (CFS). We could not have made a better choice. During his term as the Chairperson, the HLPE addressed a plethora of matters relating to food security including price volatility, land tenure and international investments in agriculture, climate change, social protection, biofuels and investing in smallholder agriculture.

In this interview, Professor Swaminathan discusses various aspects of the "Zero Hunger" vision and provides valuable insights on how we may achieve it. His observations cover a wide range of issues including challenges for the global movement to end world hunger; the evolving role of government in supporting basic scientific research and promoting technological innovation; the proper relation between food systems and nutrition; and the role of international institutions. All of us have a part to play in the fight against hunger and it is time to step up our efforts because despite the national and international efforts to ensure food security, over 840 million people still suffer from hunger.

Nevertheless, more than 40 countries have significantly reduced hunger in the last two decades, and national governments are increasingly placing food security on the top of their political agendas. The United Nations Zero Hunger Challenge, and endorsement of the same principle by heads of state and government in Africa, Latin America and Caribbean and Asia is a testament to the political priority and recognition that sustainable food security must and can be achieved with the right combination of policy instruments, including supporting the sustainable increase of small-scale and family farming production and their access markets and strengthening social protection. As 2014 is the International Year of Family Farming, let me highlight the important role they play in this effort: for many years they were considered to be part of the problem of hunger, but, in fact, they are part of its solution.

The pursuit of a hunger-free and food secure world is the cornerstone of FAO's mission. Recently, we scaled up our efforts globally and sharpened the focus of our work to better assist Member Countries to identify and implement the actions that best fit their needs as they advance towards achieving this ambitious but essential goal. This is an effort that needs a broad partnership led by governments but with the involvement of non-state actors and international support. FAO is committed to this partnership. Professor Swaminathan addresses all of us -- international organizations, national policy makers and academics -- when he says that "human well-being forms the bottom line of policy-making". I would like to take this opportunity to thank Professor Swaminathan for his many years of extraordinary service to mankind and to the FAO, and I hope you enjoy this interview.

August, 2014

José Graziano da Silva
Director-General
Food and Agriculture Organization of the United Nations

This interview was conducted on the sidelines of the 40th Plenary Meeting of the Committee on World Food Security (CFS), held at FAO Headquarters in Rome in October 2013. The interview covered a wide range of issues including challenges for the global movement to end world hunger and malnutrition, fostering innovation and a transition to sustainable agricultural practices, promoting dietary diversity and resilience of rural livelihoods, and priorities for the global governance mechanisms for food security and agriculture.

Jomo Kwame Sundaram

I. India's Green Revolution

Jomo Kwame Sundaram: Professor Swaminathan, let me begin, if I may, seventy years ago, when you made a decision to study agricultural sciences. This was in the wake of the Bengal famine of 1943. What motivated you to study agricultural sciences?

M. S. Swaminathan: In the 1940s, when I entered the university, my aspiration was to go into the medical field because my father had just died. He had built a very fine hospital, and my mother wanted me to take over the hospital. It was at that time, in 1942, that Gandhiji gave a call for the Quit India Movement. And, in 1942-43, there was the Bengal famine. Many of us, who were students at that time and were very idealistic, asked ourselves, what can we do for independent India?

So I decided, because of the Bengal famine, to study agriculture. I changed my field and went to the Agriculture College at Coimbatore, instead of going to a Medical College. And, I also decided, to go into agricultural research, and that too in genetics and breeding, for the simple reason that a good variety has the largest impact. A large number of farmers, whether small or large, can benefit from a good strain of a crop. I also got fascinated with the science of genetics as a whole.

After Coimbatore, I went to Delhi, then to Holland, then to Cambridge, and so on, over the years. I returned from the University of Wisconsin to India in 1954, and started working at the Central Rice Research Institute, Cuttack, on transferring genes for fertilizer response from Japonica varieties to Indica varieties. That was the first attempt to develop high yielding varieties which can respond to good soil fertility and good water management.

Then I shifted to Delhi, and started a similar work in wheat. Wheat was a different story because we had to get Norin dwarfing genes from Norman Borlaug in Mexico. We started working seriously on dwarf wheat breeding programme in 1963, and within five years, there was what was called the "Wheat Revolution". Indira Gandhi, the then Prime Minister of India, released a special stamp to mark the achievement.

Green Revolution Made India Self-Sufficient in Food Production

In 1947, when India became independent, we were producing about 6 million tonnes of wheat a year. By 1962, wheat production went to about 10 million tonnes a year. But between 1964 and 1968, annual production of wheat increased from about 10 million tonnes to about 17 million tonnes. Yields achieved in four thousand years of known history of wheat cultivation in the Indian subcontinent, from the time of Mohenjo-Daro, were doubled in four years, 1964 to 1968. It was a quantum jump in production, and that is why, it was called a revolutionary step.

This infused a great deal of confidence because those were days when Indian farmers had been written off by very leading authorities. External experts said that India was leading a "ship-to-mouth existence". We had to depend on PL480 wheat from the US. In 1966, a year that also saw severe drought, 10 million tonnes of PL480 wheat were imported. Doomsday experts were in plenty. Paul and William Paddock wrote a book called *Famine-1975*. Anne and Paul Ehrlich wrote a book called *The Population Bomb*, in which they said that, Indians will die of starvation if they don't die earlier by a thermo-nuclear bomb. This book was published in 1968. That was the same year Indira Gandhi released the stamp celebrating the "Wheat Revolution". When external experts were saying that Indians will starve to death, the Indian Prime Minister said that there was a revolution.

So it was a very interesting, exciting, period in our history. The work done in the last 40 years by our farmers, by scientists and by political leaders has led to a very major transition, from ship-to-mouth to right-to-food, with home-grown food. This year, the government passed a bill making food a basic right. So, from ship-to-mouth to right-to-food, with home-grown food, has been a very major transition.

India's Green Revolution: How did it Happen?

The Green Revolution became possible because various factors – provision of skills, political will and farmers' enthusiasm – all came together. We call it the "Green Revolution Symphony". This Green Revolution Symphony had three components:

First is technology, the prime mover of change. We would not have been able to increase the yields without the technology. You need appropriate technologies, which have low risk but are high yielding. This is very important because poor farmers cannot take many risks.

Sometimes, people don't realize how much work went into developing high yielding varieties of wheat. We had to genetically checkmate all the races of rust. Otherwise, it would have been completely killed. You see, conditions which are conducive for the crop to grow are the same conditions which are also conducive for the pests and pathogens. And therefore, unless you take care of the pests and pathogens, you will not get expected yield.

Secondly, the services that were needed to take the technology to the field. With nationalisation of the banking system, banks were asked to specifically focus on expanding supply of rural credit under the priority sector norms. New programmes for agricultural extension were designed to enable diffusion of technology, particularly, in targeted areas and among small and marginal farmers.

Thirdly, appropriate public policy, which ensured that the economics was right. Scientists can do the work but whether farming is economical, whether the new varieties can give reasonable incomes to farmers, will depend upon input and output prices, which are shaped by government policies. Whatever we do, unless farmers are enthusiastic, we will not get the desired results. In India, farming is a private enterprise and farmers use the land in the way they want. They will produce more only when there are assured and remunerative marketing opportunities. So the Agricultural Prices Commission and the Food Corporation of India were established, and a whole set of accompanying steps were taken. An elaborate system was developed on the basis of these organisations to set remunerative floor prices for food grains, to procure and store food grains, and to run an expanded public distribution system for food security and poverty alleviation.

The change took place not only in wheat but also in rice, and later on, in many other crops like maize, sorghum, potato, and soybean. When

farmers learnt new agronomic practices, they took them to other crops too. Even in the US, the revolution started with hybrid corn in Iowa. But hybrid corn technology involved a lot of important improvements in agronomic practices, and farmers transferred these to other crops as well. So, although it started with wheat, technological change spread to a whole range of other crops and, therefore, William Gaud coined the generic term "Green Revolution" to describe it.

I remember, in the late sixties, Borlaug and many of us were criticized by environmentalists who said that we were promoting use of more pesticides. Rachel Carson's book called "*A Silent Spring*" had been published in the early sixties. They said that the so-called Green Revolution is being spearheaded by commercial companies. The ecologists decried the new technology by saying it was environmentally harmful. The economists said that, since new purchased inputs were needed for higher output, those who have no money will not benefit from new technology. They also said that Green Revolution would exacerbate inequalities by making small farmers poorer and large farmers richer.

The criticism that adoption of new technologies required resources was true. That is why, I told the then Agriculture Minister, Mr. C. Subramaniam, who was a very dynamic minister, that we must have a programme to support small and marginal farmers, and landless labour. We started a big programme to make credit available at low cost to small farmers.

II. Ending World Hunger

Hunger as a Multi-dimensional Problem

JKS: Looking beyond the Green Revolution experience in India, there has also been a tremendous increase in the productivity of farmers and in the production of food at the global level. What happened in India has also happened in varying degrees in other parts of the world. As a result, we have much more food today than in the past. Unfortunately, we find that, while at the end of the Second World War, about one in six people were hungry, about one in eight people are hungry even today. There has been some progress but the progress has been uneven. Despite the increase in availability of food, access to food has not improved for the poorest people.

We also know that the three quarters of the people who are considered to be very poor in the world are people who work the land, or who are close to the land. This is one of the most important problems that we face today.

You have, in the course of your public lectures, and in other contexts, made a number of comments on the problem of hunger. Could you share some insights on the issue of ending world hunger?

MSS: We now have a new situation in the world, where we know that we can produce adequate amount of food, and that we can also produce more sustainably, but a large number of people still remain hungry. This is what we call "the hunger enigma".

There are three forms of hunger. First is a calorie deprivation or undernourishment. The second is protein hunger or inadequate consumption of protein. And the third is the hidden hunger, caused by the deficiency of micro-nutrients like zinc, iron, iodine, vitamin A, and vitamin B12.

If you really want to overcome hunger, you have to attack at all these three fronts: inadequate consumption of calories, inadequate consumption of protein foods, and inadequate consumption of micro-nutrients. In

addition, one has to address other non-food factors. Access to safe drinking water and sanitation are exceedingly important for absorption of nutrients by the body.

Therefore, food security is a multi-dimensional problem. It is not just a problem of providing the calories, although undernourishment is the cause of malnutrition in many cases. Cereal-based diets help in meeting a part of protein and micro-nutrient requirements too. In Africa and other places, where diets are tuber-based, like cassava, staple food does not provide as much of proteins and micro-nutrients.

Micro-nutrient Deficiencies

JKS: On the specific challenges of dealing with hidden hunger, of trying to achieve a balanced diet, what are the most important breakthroughs that we need to make on this problem?

MSS: Hidden hunger is one of the most serious parts of hunger because you require a very small quantity of micro-nutrients. But if these are absent, they can seriously impair functioning of the human body. Very small quantities of micro-nutrients make a large impact in the quality of life of an individual. Also, micronutrient deficiencies are much more widespread than deprivation in terms of calories. For example, while nearly 800 million people suffer from undernourishment or calorie deprivation, about 2 billion suffer from iron deficiency. Prevalence of micronutrient deficiencies is particularly high among pregnant women and children. A large number of children go blind because of Vitamin A deficiency.

The earlier approach to eradication of hidden hunger was primarily based on chemical fortification. Even today, for example, salt can be fortified with iron, iodine, Vitamin A and many other micro-nutrients. And everybody consumes salt. There are good and inexpensive methods of using salt as a carrier. Similarly, earlier, people thought wheat should be fortified. Chemical fortification was considered to be the approach.

The next approach was the genetic fortification. Starting with genetic fortification of rice -- what is called the 'Golden Rice' -- with a high

content of beta-carotene. Of course, that became controversial because of genetic modification.

But nature provides a wide range of naturally bio-fortified foods. A simple plant like *moringa* has almost all the micro-nutrients you need. Sweet potato is very rich in Vitamin A. There are varieties of pearl millet, commonly consumed in India, which are very rich in iron. There are varieties of sorghum, which are very rich in zinc. So, our approach should be to take naturally bio-fortified foods and introduce them in the farming system. Agricultural remedies for nutritional maladies can be easily found. They are the simplest and least expensive. In other words, we must promote nutrition sensitive farming system.

Some of the traditional culinary practices are based on knowledge of nutritional value of different food items and how to bring together plants or animal products that can provide mutually reinforcing nutrients. In Europe, combining egg and chips, or fish and chips, is based on the fact that egg and fish, and potato chips, have complementary amino acid profiles. When you take them together, one amino acid which is missing in one food is provided by the other.

I designed a programme called the Farming System for Nutrition. How do we marry nutrition and agriculture together in such a way that many of our choices of crops are based both on the market as well as on the nutritional content of the crop? DFID is supporting a large project called Leveraging Agriculture for Nutrition in South Asia (LANSA). The CGIAR calls it HarvestPlus. You harvest something but you have a bonus there in terms of nutrition. The HarvestPlus programme is doing a good job. Earlier they were thinking of mostly genetically modified crops. But, now we know, it is not necessary. There is enough variability in nature in terms of micro-nutrients. All that you need is to cultivate them and have a good yield.

We are at the threshold of a nutrition revolution based on agriculture. There is much more understanding today of the importance of using agricultural remedies for nutritional maladies. I hope the International Conference on Nutrition (ICN2) to be held in November 2014 will further show the scientific basis of integrating agriculture with nutrition.

FAO's Role in Ending World Hunger

JKS: Last year, there was a very important identification of new priorities for the United Nations. The Secretary General of the United Nations announced at the Rio+20 Conference, the Challenge of Zero Hunger, to eradicate hunger within our lifetime. There were a number of elements to this challenge, which he elaborated. At the same time, the Food and Agriculture Organization of the United Nations has identified new priorities, approved by its Member States, which are broadly aligned with the Zero Hunger Vision. Whereas previously the World Food Summit of 1996 wanted to halve the number of hungry people, now the ambition is to abolish hunger altogether.

Yet, the economic situation in the world today presents challenges. In last five years, economic growth in many parts of the world has been much slower and the prospects for growth and economic recovery in the near future, according to the IMF as well as the others, are quite dismal.

In spite of this, many countries, regions and FAO has embraced this new goal of ending hunger. FAO is focusing on five strategic objectives to assist countries in reaching this goal. What would you consider to be the new strategic priorities for the FAO, and for the international community more generally, in trying to rid the world of hunger?

MSS: I must compliment the Secretary General, that he has posed the Zero Hunger Challenge, and the FAO Director-General for fully focusing the Organization in helping countries reach the zero hunger vision. I remember many years ago, Edmund Hillary, who along with Tenzing Norgay was the first to climb Everest. Hillary was asked, "Why do you want to climb Everest?" "Because," he said, "it is there and it is a challenge." It is important to see ending widespread hunger as a global challenge. Statistics show that hunger and undernutrition continue to be widespread. Particularly maternal and foetal under-nutrition, low birth weight babies leading to impaired cognitive abilities as a result of maternal and foetal under-nutrition. We now know the problems. We

also know the solution. It is important to take on this challenge and see that hunger is abolished from our world.

I would like to identify four issues that I believe are important to advance towards sustainable food security and that are covered in FAO´s strategic objectives. For the sake of convenience, I will put them in terms of four Cs.

Conservation of natural resources

First is conservation, of natural resources.

FAO has established a global soil partnership. Long ago, FAO started a world soil charter. While the oceans provide about ten per cent of our food, ninety per cent of it has to come from the soil. So, the conservation of soil resources is very important.

Similarly, a global water partnership exists to look at all aspects of water. Land and water use have to be viewed together because land use decisions are also water use decisions. If I decide to grow rice, then I require more water. If I grow millet, I would need much less water.

In fact, I entered the FAO building for the first time in the late 1950s to attend a meeting on the conservation of genetic resources. When I was the Independent Chairman of the FAO Council, we established a Commission on Genetic Resources for Food Security.

FAO has had a long tradition of working towards conservation of natural resources. Land, water, biodiversity and now, climate-risk management, are all part of the first C.

Cultivation, with an emphasis on sustainability

The second C is Cultivation, with a particular emphasis on sustainability along with intensification.

Land is a shrinking resource for agriculture. In my own country, the land cost is so high that the farmers will get a higher and more assured income if, instead of cultivating the land, they sell it and put the money in the bank. So, we have the problem of retaining good land for agriculture.

Agriculture is a highly risky profession. And with climate-change, the risks – droughts, floods, high temperatures – are increasing.

So, the challenge is, how to provide higher incomes through cultivation of crops? The smaller the farm, the greater is the need for marketable surplus. And hence you have to have, what is called the sustainable intensification of cultivation.

Consumption, with an emphasis on diversification of diets

And the third C is the whole area of consumption. Consumption is an area where FAO, in my view, should make more contribution in widening the food basket.

With commercialization of agriculture, particularly with large multinationals engaging in grain trade, you find that the grain trade has become very narrow and is limited to four or five crops like wheat, rice, corn and soybean.

FAO has so many diagrams to show that in the past we had a very large number of crops in the food base. We must revive the earlier culinary traditions, which involved a large number of crops.

That is why the declaration of 2013 as the Year of Quinoa is very important. People need to know that there is a crop like this. I have been suggesting we should have an International Year of Orphan and Underutilized Crops.

With great difficulty, I got the Indian Food Security Act to include, apart from wheat and rice, the traditional two crops in the public distribution system, the whole set of millets in the basket of commodities that will be provided.

The consumption pattern and the culinary diversity must be enlarged in relation to consumption of grains because many of these crops are also much more climate resilient. They do not require so much water. Unfortunately, if you see the globally important heritage agricultural systems, you will find many of them grew crops that are either extinct or which farmers are not growing any more.

Commerce, with emphasis on protection of small farmers

The fourth C is Commerce.

The challenge in this area is, how do you protect the small farmers and ensure that they get a fair price in the market?

Because all said and done, progress towards a right to food can only be possible if farmers – in particular, small farmers – are provided an assured and remunerative procurement price, and a commitment to procure what they produce at that price.

In trade, of course, WTO is there. But we have to ensure that there is no conflict between WTO rules and the goal of food security and overcoming hunger. The Zero Hunger Vision should be the bottomline of WTO policies on food grains.

I think, FAO has a big job ahead of it in all these areas. We also have to ensure that all organizations, including the WTO, coordinate for achieving the hunger target. It should not be the role of FAO alone, but of all the sister organizations of the UN. We must have the same commitment that the bottom line for all of our work is eradication of hunger.

Global Trends in Prices of Food

JKS: One of the great achievements of the second half of the twentieth century was that food prices, generally speaking, came down and it helped in reducing poverty and hunger. This was a very important development. But since around 2006, with the biofuel mandates as well as the increased speculation involving commodity futures and options, we have seen that food prices have gone up again. While high prices may provide an incentive to small farmers, they limit our progress on eradicating hunger.

MSS: The escalation of cost, both of food and fuel, in the last decade has affected the poor very badly. After all, the poorer you are, the higher the percentage of your income that goes for procuring food. If there is high volatility in prices of food, the poor suffer the most. And women and children suffer even more than the others. This is why we should promote human well-being as the bottom line of policy-making.

III. Investing in Technology for Value Addition in Agriculture

JKS: 2014 is the Year of Family Farming. Many of your remarks have suggested the difficulties smallholder agriculturalists face. You talked about increasing productivity, about the need for availability of affordable credit and other types of initiatives which might be taken to make smallholder agriculture much more viable than has been the case so far. At the same time, many people would point out that the ratio between the farming population and the land is very high in many parts of the world. And it is difficult to reduce rural poverty with that population land ratio. What is your own view? Of course, situations vary in many parts of the world. But what would you recommend in terms of initiatives?

MSS: The population issue is a real issue. Because, as it is said, people cannot live with food alone. India, for example, has a very large young population. Over 60 per cent are below the age of 35. They have to get jobs, they have to have houses. The demographic situation has to be handled keeping in mind the population-supporting capacity of an ecosystem.

Agriculture promotes job-led economic growth while much of modern industry promotes job-less growth. We are just at the beginning of the phase of value addition to products, value chains and so on, which is now being talked about. How do you prepare more value-added products from every part of the biomass? For sustainable intensification, we will need to use techniques like bio-fertilizers, bio-pesticides and vermiculture. I call these biological software enterprises. How do you support enterprises to provide these inputs for sustainable agriculture? Development of these enterprises needs to be much more rooted in science.

Information technology and biotechnology are transformational technologies. We must make enough investments in technology that is relevant to the small-scale farmers. For example, there are two kinds of

information that are important for farmers: information about weather and information about markets. In India, the livelihood of the farmer depends upon the monsoons and the market. These are being conveyed to them these days through mobile phones.

If you want to promote job-led growth, we must look at agriculture, and the new opportunities in value chain development in agriculture. Growth in employment opportunities needs to come from these biological software enterprises.

For example, Government of India is setting up a rice bio-park in Myanmar because, there, rice is the most important crop. But many farmers are poor. We have undertaken the task of setting up the Rice Bio-Park to show the products that can be made from the straw, the bran or from the husk, and to show what value addition can be done to the grain. An enormous number of new jobs and additional income can be created through such value addition. FAO can help in these areas of research, on post-harvest technology, value addition to primary products, and the biomass utilization.

IV. Role of Public and Private Sectors in Agricultural Research

JKS: Much of the research for the Green Revolution was publicly-funded or philanthropically funded. Technological diffusion, through extension services, was led by governments. A major difference between that period and now is that technological change today is very much driven by private corporations. There is a great deal of popular resistance, not least by farmer groups and by others concerned about environment and ecology, to the terms and conditions on which technology is being developed and provided. With technology becoming a private property, and the profits that are associated with intellectual property rights over technology, there is a great deal more scepticism about technological change.

MSS: This is a real problem, and I think the pros and cons of the role of public and private sectors have to be analysed very carefully. In countries like India, China and Brazil, public good research is still the dominant form of research. For example, over 80 per cent of the investment in agricultural research in India comes from the Government of India. Rest of the 20 per cent is accounted for by various types of private investment including by seed companies and companies producing farm machinery. But predominantly, public good research is still the dominant form of research. It may change in future.

The private sector is unlikely to invest in areas where returns are low. For example, take a public health issue - private companies are not going to produce a vaccine for leprosy because leprosy-affected people are poor and cannot pay for it. So there are areas – in health, agriculture or even industry – where public-sector research is crucial.

There are also other differences between public research and for-profit research. For example, historically, farmers are used to keeping their own seeds. But, in promoting new varieties of seeds, a private company may prefer a hybrid seed because farmers will have to buy seeds every year.

I do not approve of intellectual property rights for technologies that can help the small farmers produce more. It is important that both options – preserving their own seeds and buying new seeds – are available to farmers. Many farmers will not be able to buy seeds. I have also been arguing that, when companies sell expensive seeds, they should also provide insurance. In areas like Vidarbha in Central India, there is a continuing incidence of a large number of suicides by farmers because they take to high cost technology without the ability to cope with the loss, which often occurs for reasons beyond their control.

Every country will have to strike a balance between public good research to ensure availability of appropriate technologies to resource-poor farmers and private research for high-value agriculture and horticulture for resource-rich farmers producing for niche and export markets. We must ensure that in the science policy of a country, there is adequate provision to ensure that technological solutions for problems of the poorer sections of the population are researched and that technology is available free to them, without IPR restrictions.

The bottom line should be the wellbeing of the poorer sections of the community. Gandhiji used to talk about *antyodaya*, wellbeing of the worst-off person: look at whether your actions are going to benefit the poorest person. That is the test we should use for public funding. If it is going to do something good for the poor, you should go ahead and do it. So, I think that has to be the policy in a country with a lot of economic disparities, where there is a lot of human suffering, and a lot of people are living at or below the subsistence level.

V. Food Self-Sufficiency in the Era of Globalisation

JKS: The Green Revolution was part of a movement towards greater national food self-sufficiency in many developing countries. Since the 1980s, the argument has swung to the other side, where many people are saying that, with globalisation, you can meet your food requirements internationally. You don't have to produce your own food. This view has been dominant, especially in the last three decades. At the same time, in recent times, as you know, there has been the resurgence of what is called the food sovereignty movement. So the debate continues. What do you think about this debate and where do you stand?

MSS: Globalization has its advantages but it should not result in undermining sovereignty in the area of food. A country has to ensure that it has the minimum amount of food that is needed.

Globalisation's benefits are seen, for example, in diffusion of information technology, which has benefited everyone, including the poor. But it is important to protect areas where globalisation would result in job losses. Job-led growth should be the most important priority. Also people have diverse preferences of what they would like to do. Globalisation should not undermine that diversity.

Price volatility in international markets is very high. With a country of 1.2 billion in India, we can't afford to depend on imported food for managing our food security. Our Food Security Act cannot be managed on the basis of imported food. If big countries like India or China buy large quantities of grain from the international markets, this would drive international prices up.

So, I think, in areas like food or drinking water, which are fundamental requirements of human beings, national governments have the primary responsibility. They should ensure that their sovereignty is protected. Food sovereignty is important because people cannot live without food. And hence, I would say in such cases, a more balanced approach should be adopted.

VI. India's National Food Security Act

JKS: After India's Right to Food Act was passed by the Indian Parliament, some countries raised an objection at the WTO that this was likely to result in India violating its commitments under WTO's Agreement on Agriculture. There are many proposed ways forward and apparently the issue has been put on hold for the time being. But this will become a major issue in the time ahead because what is possible in India will also be very important for the rest of the developing world. If India can achieve something, then other developing and less-developed countries may be able to emulate India. But, if even India cannot go through with something, then it becomes a major deterrent to other countries.

MSS: First of all, WTO was established as a rule-based organization for free and fair trade. And it generally covers only crops that are produced for export market. What you grow for internal consumption, is not really what the WTO should deal with. The US, for example, gives very large subsidy to its farmers, classified under the WTO's Green Box. Each country gives subsidies to its farmers according to their own capacity. I am rather surprised that the Indian Food Security Act, a purely humanitarian bill that would ensure people have minimum amount of food, is being challenged. After all, fundamental human needs come before anything else.

I think that the first and foremost duty of any government is to eradicate hunger. Somewhere in this building, I saw a photograph of Mahatma Gandhi with a quotation from him saying, "to the millions who have to go without two meals a day...God can only appear as bread". Gandhiji said, this God of bread must be available to every home and hut in an independent India. It is after a long time, after more than sixty years of independence, we have been able to redeem that pledge. I think countries that have some objection should also realize we are all humans, and it is important that we think of humanity rather than some petty regulations.

We had the same problem when we introduced the Protection of Plant Varieties and Farmers' Rights Act in India. I was the author of that bill. The International Union for the Protection of New Varieties of Plants

established by the UPOV convention in Geneva along with the World Intellectual Property Organization (WIPO) said that we could not protect farmers' rights. I said, what is the purpose of breeders if there are no farmers? Farmers are the primary conservers and we insisted that their rights must be protected.

I think, we have to introduce some sanity in these negotiations.

Some external agencies are suggesting that it will be much better for India to distribute cash, as was done, for example, in Brazil as part of Bolsa Familia, rather than distribute food. In India, agriculture is not merely a food-producing machine. It is the backbone of the livelihood security system of seventy per cent of the population. If the food they produce is not purchased at a remunerative price, they will not produce. Therefore, before making recommendations like cash transfers instead of grains, people should understand the socio-economic conditions under which farmers work in India. That is the main difference between agriculture in developing countries like India and in developed countries like Canada or the United States. In those countries, farming is just another business. In India and in many other developing countries like in Africa, it is a livelihood industry and a way of life. Those who are advocating and making policies should recognize this fundamental difference in the occupational situation in the world.

JKS: India, in particular, has a lot of experience with different kinds of social protection programmes. The public distribution system (PDS), the targeted PDS, the National Rural Employment Guarantee Act, cash transfers, and now, the legislation on Right to Food; these have all been very major experiments from an international perspective. A variety of instruments have been implemented in India, which others can learn from, and India, in turn, can learn from other experiences.

MSS: We need to look at the whole issue of access to food, which is a function of purchasing power or employment. I always say, for looking at the progress on hunger, instead of measuring food deficit in terms of million tonnes of grains, it will be more appropriate to measure unemployment in terms of million person years of jobs.

We also need to think about what kind of social support can be given to those who have no purchasing power. There have been various experiments on social protection starting with programmes for women and children, school noon-meal programmes, and food-for-work programmes. The most recent programmes in India are about entitlement to work and food. Food entitlement is a legal entitlement to give every person a certain amount of grain. At least that can help you to partially overcome the problem of calorie deficiency or undernourishment because that is one of the forms of hunger.

At the same time, in some cases, we have wrong policies. For example, provision of free or subsidised electricity in India, leads to the depletion of the ground water and what I call subsidies for ecocides, the ecological suicides. That is why I said synergy between technology and public policy is extremely important. If either of them – technology or public policies – is wrong, then you won't get the desired results.

VII. Role of CFS in Eradication of World Hunger

Importance of CFS in Global Governance of Food Security

JKS: If I may turn to your leadership of the High Level Panel of Experts on Food Security and Nutrition (HLPE) set up by the UN Committee on World Food Security (CFS). During your tenure as Chair of the HLPE, you provided very important intellectual leadership in a number of new areas which the CFS had to confront. What do you see as the potential role of the CFS in generating new norms on food security and related issues? I am particularly concerned about this because the CFS provides norms but its norms lead to things like Voluntary Guidelines rather than international law or the kinds of binding agreements established through WTO.

MSS: CFS is a very powerful mechanism for sharing views and developing consensus on important global issues related to food security. This is because the CFS brings together the civil society organizations, the private sector, governments and the academics. It has created a platform for partnership of all of these. But the CFS is not like WTO or any of those organizations that create rules. CFS can only recommend. Its resolutions can be considered by governments, which are, after all, part of the CFS. Thus, CFS influences public policy in a different way.

The CFS is an idea-generating, knowledge-sharing advisory body. It cannot do more than generate and share ideas because what needs to be done to achieve food security – in the areas of production, increasing purchasing power, and provision of drinking water, sanitation and health care – are primarily responsibilities of national governments. Ideas that are emanating from the CFS could help them.

Having a think tank like the HLPE and its steering committee to support a body like the CFS is a very good mechanism to look at science-based solutions to problems. On demands of the CFS, HLPE has dealt with some of the most important issues. What should be the minimum level of social protection, the social protection floor? What should be done for food security in view of climate change? And, on biofuels and food

security, we looked at how to make energy and food security mutually reinforcing and not mutually competing.

Proceedings and conclusions of the CFS take into account the views of all the sectors, the civil society, the private sector, and the governments. I hope this experiment in consultative management of food security will be given the necessary support by member governments and used to inform national policy making.

It is inevitable to have a diversity of approaches in a body like this. Every country has its own development agenda and the representatives come here briefed by their national governments. That is why, in my statement in the opening session of this 40th plenary meeting of the CFS, I talked of the importance of the CFS in bringing about a fundamental unity of purpose, although there may be diversity of approaches, in achieving our common goal of a hunger free world.

Functioning of the HLPE

JKS: On a number of issues, the leadership of High Level Panel of Experts has been very important in breaking new ground. For example, the question of foreign land acquisitions. This has been a very sensitive issue in some parts of the world, particularly in Sub-Saharan Africa in recent years. Another big issue has been the question of climate change. Agriculture is believed to contribute quite a bit to global warming. A third area where you have made a very important contribution is the question of biofuels.

MSS: In the CFS, as far as the HLPE is concerned, I have done two things.

First, in the beginning itself, I told the CFS Bureau that our work will be demand driven. CFS, through its consultative process involving national governments, civil society and private sector, should identify the problems on which they want us to prepare reports. I did not want the HLPE to become another academic institution churning out reports, which you may or may not like. Therefore, all the six reports done in my time, and the two more that are in the pipeline, were all asked for by the members of the CFS. And that is why the CFS has taken them seriously.

Secondly, I have always felt that, in these matters, the process of development of the report is as important as the product. Therefore, we followed a broad consultative process, putting everything on the website, including the scope and the terms of reference, the study team, and the first, "V0" draft. In fact, we have done a transparent, detailed process documentation, about how we functioned. I think, this is probably the first time in this house, that there is a very detailed process documentation of the way in which the Steering Committee and the HLPE functioned.

The work has given me a great satisfaction also because the problems that have been taken up are exceedingly important for food security.

VIII. Future Directions for the Work of FAO

JKS: Professor Swaminathan, do you have any recommendations for what we need to emphasize in our work at FAO – work which we are doing but perhaps we are not putting enough emphasis on, or work which we are not doing? Do you have any parting words on the work that we do here?

MSS: FAO is a member-based organization. I have been the Independent Chairman of the FAO Council for four years, from 1981 to 1985. Much of FAO's agenda is in response to members' suggestions, the Programme Committee and so on. There are so many things to be done but there are also other organizations.

FAO can play a catalytic role given its strength, particularly in comparison with other organizations, like the CGIAR. Unlike CGIAR, FAO is an inter-governmental and a UN body. So FAO has an important role to play.

FAO must have two kinds of agenda. First is, of course, what is in response to demands from the members. Secondly, FAO needs to be proactive and look at the emerging problems.

In my small centre (the M.S. Swaminathan Research Foundation), we have a whole anticipatory research programme, dealing with seawater farming. Ninety seven per cent of the world's water is sea water. What are we doing with it and what could we do with it?

FAO should be forward looking at emerging problems and new technologies. I am not talking of controversial technologies like genetic modification. But FAO should keep an eye on the emerging problems and challenges before agriculture. There are budgetary constraints. But given these constraints, the agenda should comprise of two kinds of things: to address the problems of today and to address the problems of tomorrow. It is by looking also at the problems of tomorrow that FAO can provide leadership.

JKS: As you know, the Director-General Graziano launched a new 'Strategic Thinking Process' after he took over. At the end of this process,

the organization has identified five cross-cutting strategic objectives to facilitate all the different units in FAO to work together as an organization. Through these strategic objectives, the organisation has prioritised the work towards ending hunger and malnutrition, increasing sustainable production, elimination of rural poverty, enabling more inclusive and efficient food systems, and increasing resilience of livelihoods. Problems of today -- hunger, malnutrition and rural poverty – as well as problems of tomorrow – climate change, sustainability of food systems and resilience of livelihoods appear very prominently in the new Strategic Framework. In that sense, the organization really shares with you the vision that you have elaborated, and I believe that our Strategic Framework provides a path for us to work towards realising that vision.

With this, let me thank you Professor Swaminathan, for your very valuable insights.

Rome
October 11, 2013

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