Food and nutrition security towards human security

by

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ABSTRACT

On the occasion of the World Food Summit five years later, which was convened in Rome on 11-13 June 2002, the current situation of food insecurity and malnutrition has been reviewed. The current efforts being made by FAO’s member countries to improve the situation have not yet produced the expected results. The paper will set the scene of the present reality in light of the baseline assessment made in 1996. The main conclusions and recommendations made on the occasion of the WFS-FYL, as reported in the Summit Declaration, are summarised. Reference is also made to important concepts and follow-up initiatives linked to the overall strategy for improving Food Security viz. the Anti-Hunger Programme, the Right to Food, the Millennium Project. In light of this overall picture, the importance of vegetables in human nutrition is analysed. Information is provided on the current trends and awareness for quality as a basic health requirement, but also as an essential criterion for marketing. Production technologies, which are instrumental to high quality and safe vegetables, are described and reference is made to the expanding niche market for organic produce. The paper illustrates the assets of horticultural crops in terms of income and employment generation, and their expanding role in the countries’ food security strategies and derived health benefits. As a conclusion, the relationship between food security and human security is discussed.

On the occasion of the WFS-fyl (World Food Summit - five years later), which was convened in Rome on 11-13 June 2002, the current situation of food insecurity and malnutrition has been reviewed.

1. About 815 million people suffer from chronic hunger. The annual reduction achieved over 1990-1992 to 1997-1999 period was 6 million (as opposed to the target reduction of 20 million annually as set by the WFS in 1996). If the WFS target of halving the number of undernourished by the year 2015 to 400 million, a reduction of 22 million undernourished per year is needed.

2. Success will require political will, resources, technology, and fairer trade. The WFS-fyl called for an international alliance for reducing world hunger. It also unanimously adopted a declaration calling on the international community to take action so that the pledge to reduce the number of hungry people to approximately 400 million by 2015 is fulfilled. That pledge was already made at the original World Food Summit in 1996 - the largest-ever global gathering of leaders to address hunger and food security - and progress towards it remained disappointingly slow.

3. The World Food Summit, five years later, which was attended by delegations from 179 countries plus the European Commission and called for:

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1 With the contribution from Hartwig de Haen and Kostas Stamoulis, of the Economic and Social Department; from Kay Killingsworth and Nadine Valat of the Sustainable Development Department and World Food Summit Secretariat; from Maya Pineiro and Catherine Bessy of the Food Quality and Standards Service; Abdul Kobakiwal and Fintan Scanlan of the Special Programme for Food Security Co-ordination and Monitoring Service; Eric Kueneman, Jantien Emmens, Lucie Herzigova, Gianna de Cesare from the Crop and Grassland Service; Boyd Haight and Rita Walsh from the Agriculture Department. Pierre Brat, Max Reynes, and Jean-Marc Brillouet from CIRAD, France; Vincent Rubatsky and Ronald Voss from University California Davis, California.
• an intergovernmental working group to develop voluntary guidelines to achieve the progressive realization of the right to food;
• reversing the overall decline of agriculture and rural development in the national budgets of developing countries, in assistance provided by developed countries, and in lending by the international financing institutions; and
• voluntary contributions to the FAO Trust Fund on Food Safety and Food Security.

4. The Summit offered a forum for all ‘stakeholders’ in the fight against hunger. More than a dozen side events provided opportunities for delegates to discuss topics ranging from the role of rural women in feeding the world to FAO's activities in emergency situations. In addition, a parliamentarians' meeting, a private sector forum, and a forum for non-governmental and civil society organizations took place in parallel to the official event.

5. Member Nations divided into three round tables to review progress achieved in reducing hunger since 1996. Constraints highlighted included insufficient water supplies, lack of access to technology, inadequate investment and depletion of natural resources. Two major constraints stood out -- lack of political will and lack of resources.

6. The World map on the dietary energy supply (DES) prepared by FAO illustrates the countries where people are more likely to have enough food. The paradox consists in the fact that sufficient food is produced to meet the requirements for all people on the planet, sufficient knowledge is available about the necessary balance of essential nutrients needed for proper growth and for prevention of nutritional disorders. However, hundreds of millions of people are hungry and more than one third of humanity suffers from malnutrition caused by lack of essential vitamins and minerals. In many countries “access to food” is the real problem. Even where food supplies are adequate, they are not always available to those in need. To ensure nutritional wellbeing, every individual should have access at all times to sufficient supplies of a variety of safe, and good quality foods.

7. The simultaneous persistence of widespread extreme food deprivation and plentiful food supplies in a world with excellent means of communications and transport, can only suggest that there are fundamental flaws in the way in which nations are functioning and the relationships between them are governed and managed. While food is being distributed to the needy through emergency operations and World Food Programme interventions, the continuous transfer of food surpluses to the needy has considerable economic implications which may not be a sustainable solution to endemic food shortages.

The current efforts made by FAO’s member countries to improve the situation have not yet produced the expected results.
8. FAO's latest estimates indicate that, in 1997-99, there were 815 million undernourished people in the world: 777 million in the developing countries, 27 million in transition countries and 11 million in the industrialised countries. For the developing countries, the latest figure represents a decrease of 39 million since 1990-92 (the benchmark period used at the World Food Summit), for which the revised figure is 816 million undernourished. This means that the average annual decrease now stands at about 6 million people.

9. Clearly, there has been a slowdown in the reduction of undernourished in the world. As a consequence, to achieve the World Food Summit goal of halving the number of undernourished in developing countries by 2015, the average annual decrease required is no longer 20 million but 22 million - well above the current level of performance. The overall decline in the number of undernourished in the developing countries hides contrasting trends which are illustrated in the graphs below.

10. The performances largely vary from for example quite good in Peru to very preoccupying trends in the Democratic Republic of Congo and Democratic People’s Republic of Korea. At present, the human population is increasing by 80 million persons a year, mostly in the poorest countries. The understanding of the evolution in the number of undernourished has to be waived against the world population growth which remains steady but also largely varies according to regions and countries, as illustrated below.

11. Projections indicate that the goal set by the Summit in 1996, of halving the number of under-nourished people by the year 2015 to 400 million, will not be achieved unless approached with renewed determination. It lies well within current technical, institutional and financial capacities to win the battle against hunger. Chronic hunger is both a cause and effect of poverty, the paper states. "As long as people - whether adults or young children - are hungry, their response to development opportunities is bound to be inhibited.” In most economies, the presence of widespread hunger stunts the potential for national economic growth. Only if people have enough to eat, will they be able to work and generate wealth.
12. Since the WFS in 1996, there is no clear evidence of a rise in international or domestic resources for agricultural development. Instead, Official Development Assistance for agriculture has fallen steadily. Relatively modest investments, combined with simple technology changes, can raise small farmer productivity, improve food security and reduce poverty.

13. The main conclusions and recommendations made on occasion of the World Food Summit, five years later are reported in the Summit Declaration, which is appended as an Annex to this paper.

A series of initiatives and concepts have originated from the debates and are being implemented in order to assist the member countries in achieving improved food security.

- **The Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS).**

14. FIVIMS is an Inter-agency programme and is now well established with members representing international and bilateral donors, technical UN agencies and NGOs. The IAWG-FIVIMS is supported by a Secretariat housed in FAO headquarters in Rome (Italy). At the international level, FIVIMS implements diverse activities in support of national information systems, to enable them to become part of an international information exchange network. At the country level, FIVIMS works with a network of information systems that gather and analyse relevant national and sub-national data that measure food insecurity and vulnerability.

- **Anti-Hunger Programme**

15. Bringing hunger reduction on track to meet the WFS target requires that priorities are set and resources mobilised towards achieving the goal. The FAO secretariat unveiled, during the WFS-fyl, the first draft of the “Anti-Hunger Programme”, a document which constitutes a blueprint for action on five priority areas for action along with estimates of resource requirements towards the priority areas so that achievement of the WFS goal becomes possible. Four of those areas are related to promoting agriculture and rural development and one to enhancing direct access by the hungry to food. The Anti-Hunger Programme promotes the twin goals of hunger and poverty reduction through agriculture and development, and that of sustainable utilization of the resource base. The incremental resources required to implement the programme amount to US$24 billion $ annually.

16. The achievement of the target of halving the number of undernourished by 2015 is not conceivable without the broad participation of all stakeholders. It is recognized that formal responsibility for eliminating hunger rests with the governments of both developing and developed countries working in partnership with each other. It is for each country, in particular through its legislative bodies, to set its own national targets for halving undernourishment by 2015 and for governments to put in place a hunger reduction strategy as well as plans to achieve this target. Donor and recipient country governments will have to work closely with each other to ensure adequate financial support for the national initiatives.

17. However, success will also depend on the full engagement of the international community and civil society in all its dimensions, working together in complementary ways towards a common goal. At the international level, key players include the UN system, other intergovernmental organisations and the IFIs. Within civil society, much of the driving force comes from parliamentarians, NGOs, academic institutions and philanthropic foundations, as well as individual citizens. The private sector also has a major role to play, especially given its enormous and growing role in developing new technologies and in managing the flow of international agricultural production.

18. FAO, therefore, proposes that all those concerned with eliminating hunger, at the national and international levels, form an international Alliance against Hunger. The Alliance would be an association in which governments and parliaments work with the international community, civil society organizations, the private sector and concerned individuals. It would build on the many existing initiatives and institutions that are already successfully engaged within their respective mandates in the fight against hunger and would offer a framework for all of them to join forces in giving the hungry a stronger voice and responding to it.

- **The Special Programme for Food security**

19. The Special Programme for Food Security (SPFS), launched by FAO in 1994, responds to the urgent need to boost food production in Low Income and Food Deficit Countries (LIFDCs), to meet growing market demands and...
to help eradicate food insecurity. Its objective is to assist LIFDCs to improve their national food security through rapid increases in productivity and food production, reduction in year-to-year variability in production, and to improve access to food through a multi-disciplinary and participatory approach on an economically and environmentally sustainable basis. Increasing net income of farmers, generation of rural employment, consideration for social equity and gender sensitivity are at the core of SPFS.

20. Today there are over 800 million people in developing countries, about 20 percent of their total population, who are chronically undernourished, lacking sufficient food to live healthy and active lives. Millions more live in conditions that expose them to risk. The world population is increasing by 80 million persons per year, mostly in the poorest countries.

21. Despite impressive advances in agriculture, in many developing countries food production has failed to keep pace with the demand posed by a rapidly growing and increasingly urban population, giving rise to alarming forecasts for the future. According to current estimates, by the year 2025 the world’s population will have risen from the present 5.7 billion to 8.3 billion, with most of the increase being in developing countries. In sub-Saharan Africa, for example, the agricultural sector would have to feed a population which is expected to increase from 550 million in 1995 to 1200 million by 2025.

22. Access to an adequate supply of food is the most basic of human needs and rights. Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food ... for a healthy and active life (World Food Summit Plan of Action, para 1). To achieve this goal four conditions have to be met, namely:

- adequate availability of food supply
- stability of supply
- accessibility to food.
- quality and safety of food

23. The SPFS also draws from Agenda 21, unanimously adopted at the 1992 United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro. As stated in UNCED Agenda 21, Chapter 14.6, “The major thrust of food security…is to bring about a significant increase in agricultural production in a sustainable way and to achieve a substantial improvement in people’s entitlement to adequate food and culturally appropriate food supplies”. As the world’s population and living standards rise, the need for food will grow, and the availability of under-utilised arable land will continue to decrease. Chapter 14.1 states: “Agriculture has to meet this challenge, mainly by increasing production on land already in use and by avoiding further encroachment on land which is only marginally suitable for cultivation”. Agriculture must be transformed to promote sustainable food security for the millions of hungry people in the world.

24. The challenges of urban poverty and environmental destruction are unprecedented and will only increase as the urban populations of developing nations are expected to treble over the next two generations. It is inconceivable that there should be some 800 millions persons going hungry in a world that has the resources to provide for the most basic of human beings. “In the 19th century, some people looked at the condition of slavery and said that it was monstrous and unconscionable, that it must be abolished. They were known as the abolitionists. They did not argue from economic self-interest, but from moral outrage. Today the condition of hunger in a world of plenty is equally monstrous and unconscionable. We must become the “new abolitionists”. (Ismail Serageldin, 2002).

25. At the World Food Summit, Rome 1996, Heads of State and Government, made the following seven commitments that address the conditions necessary to achieve food security for all:

1. creation of an enabling political, social and economic environment
2. eradication of poverty and inequality
3. production of adequate and reliable food supplies
4. establishment of a fair and market-oriented world trade system
5. prevention of and preparedness for natural disasters and man-made emergencies
6. optimal allocation and use of public and private investments
7. implementation, monitoring and follow-up of the Summit Plan of Action at all levels.
26. The Special Programme is expected to contribute substantially to the implementation of the World Food Summit Plan of Action. It addresses food security in the broadest sense, dealing not only with increases in production, productivity and stability of supplies, but with all aspects of agricultural and rural development related to food security including farming systems, processing, trade, marketing, credit, extension, and the elimination of rural poverty.

- **The right to food**

27. The Rome Declaration on Food Security adopted at the World Food Summit in 1996 includes the following statement: "We, the Heads of State and Government,...reaffirm the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger".

28. Hunger is both a violation of human dignity and an obstacle to social, political and economic progress. International law recognizes that everyone has the fundamental right to be free from hunger, and 22 countries have enshrined food rights in their constitutions. National governments must do everything possible to ensure that people have the physical and economic access to enough safe, nutritious food to lead healthy and active lives.

29. The right to food, does not mean free food. A common misunderstanding is that the right to food requires the State to feed its people. This is not necessarily the case. Rather, the State must respect and protect the rights of individuals to feed themselves. Direct food assistance is mainly called for in emergencies, such as natural disasters or war. When a country cannot meet this need through its own resources, the State must request international assistance. 18679/ G. Bizzari

- **The UN Millennium project**

30. It is understood that the Global Endeavour for Improved food security can only be successful as part of a Global commitment to eradication of poverty which will be pursued by the Millennium Project under the overall guidance of the Secretary General Kofi Annan and the United Nations Development Programme (UNDP). This Project, which will galvanize energies and provide a focus for concerted action by governments, agencies and individuals, will essentially consist of the following four elements.

(i) A set of time bound targets for poverty elimination. Drawing upon data on the nature, dimensions and location of poverty, the world's leaders should commit themselves to remove absolute poverty everywhere by the year 2020.

(ii) Policies and programmes in different regions and countries. Evidently, the public sector will need to play a central role in providing and coordinating essential services.

(iii) Allocation of responsibility for implementing its policies and programmes. For the plan to succeed, it must rely on distinctive contributions by many parties.

(iv) Regular monitoring of progress in achieving targets for poverty elimination.

**In the global endeavour for improved food security, the diversity of vegetable crops and their nutritional value are of special significance.**

31. The Department of Nutrition for Health and Development of WHO, in collaboration with the Food policy and Nutrition Division of FAO, continually reviews new research and information from around the world on human nutrient requirements and recommended nutrient intakes. This is a vast and never-ending task, given the large number of essential human nutrients. These nutrients include protein, energy, carbohydrates, fats and lipids, a range of vitamins, and a host of minerals and trace elements.

32. Many countries rely on WHO and FAO to establish and disseminate this information, which they adopt as part of their national dietary allowances. Others use it as a base for their standards. The establishment of human nutrient requirements is the common foundation for all countries to develop food-based dietary guidelines for their populations.

33. Establishing requirements means that the public health and clinical significance of intake levels – both deficiency and excess – and associated disease patterns for each nutrient, need to be thoroughly reviewed for all
age groups. Every ten to fifteen years, enough research is completed and new evidence accumulated to warrant WHO and FAO undertaking a revision of at least the major nutrient requirements and recommended intakes.

34. People have always been interested in food. Proper nutrition means the intake of many different kinds of food with a proper balance and in optimal amounts. The term “undernourished” is used to designate those people lacking or having inadequate caloric intake. The term “malnourished” is used to designate people lacking minimum daily intake of proteins including essential amino-acids, vitamins and essential minerals and micro-nutrients. Undernourished people are likely to be also malnourished.

35. For guidance, consumers can refer to the Recommended Daily Allowances for proteins and vitamins published by the Food and Nutrition Board of the National Academic of Science, National Research Council in the United States. Vegetables play an important role in providing vitamins, minerals, micro-nutrients, as well as proteins to obtain a balanced diet. Starchy vegetables and more specifically the root and tuber crops play an important role as a source of calories to meet the energy requirements.

36. Vegetable used throughout the world number in several hundreds and besides the botanical classification they are also classified according to different parameters such as adaptation to different climates and in particular to the temperatures, the edible parts, tolerance to salinity, tolerance to soil acidity, preferred soil type and habitat.

37. Considering the many components that go into human nutrition it is difficult to assess the overall nutritive value of a crop, but attempts have been made in this direction. Grubben, G.J.H. (1978) proposed the “average nutritive value” (ANV) based on the following empirical formula.

\[
\text{ANV per 100 g of edible portion} = \frac{\text{g protein}}{5} + \frac{\text{mg Ca}}{100} + \frac{\text{mg Fe}}{2} + \frac{\text{mg vitamin C}}{40} + \frac{\text{mg carotene}}{}
\]

The ANV can be used to rank vegetables according to these nutrients considered important and obtain from vegetables yield per unit area, and efficiency of production on an area-time basis. Grubben (1978) compared some vegetables on these basis, as illustrated in the table.

| Table: potential yield of average nutritive value (ANV) from several types of vegetables |
|-------------------------------|---------------------|---------------------|---------------------|
| Vegetable | Harvest portion | Edible portion | ANV per m² | Duration (days from planting to harvest) | ANV (per m² per day) |
| Fleshy fruits |
| Tomato | 45 | 42.3 | 2.39 | 101 | 160 | 0.63 |
| Eggplant | 25 | 24.0 | 2.14 | 51 | 200 | 0.27 |
| Sweet peppers | 30 | 26.1 | 6.61 | 173 | 130 | 1.33 |
| Okra | 15 | 13.5 | 3.21 | 43 | 90 | 0.48 |
| Cucumber | 50 | 40.0 | 1.69 | 68 | 150 | 0.45 |
| Watermelon | 40 | 25.2 | 0.90 | 23 | 120 | 0.19 |
| Leaf Vegetables |
| Amaranth | 30 | 18.0 | 11.32 | 204 | 50 | 4.08 |
| Water spinach | 80 | 57.6 | 7.57 | 436 | 270 | 1.61 |
| Chinese cabbage | 30 | 25.8 | 6.99 | 180 | 90 | 2.00 |
| Lettuce | 20 | 14.8 | 5.35 | 79 | 50 | 1.58 |
| White cabbage | 40 | 34.0 | 3.52 | 120 | 90 | 1.33 |
| Cassava leaves | 60 | 52.2 | 16.67 | 870 | 270 | 3.22 |
| Leguminous vegetables |
| Asparagus bean (pods) | 7 | 6.2 | 3.74 | 23.0 | 150 | 0.15 |
| Lima bean (fresh) | 9 | 5.1 | 4.88 | 25.0 | 210 | 0.12 |
Mung bean (sprouted) 2.5 20.9 2.94 61.5 110 0.56
Hyacinth bean (dry) 3 3.0 14.03 42.1 180 0.23
Bulbs, tubers, roots
Onion 40 38.4 2.05 78.7 150 0.52
Carrot 20 16.6 6.48 107.6 90 1.20
Taro 20 16.8 2.38 40.0 120 0.33
Turnip 13 10.3 2.03 20.9 80 0.26

Source: G.J.H. Grubben (1978) a 1kg. of dry mungbean seed produces 9 kg. of sprouts.

38. Under nourishment usually relates to insufficient levels of energy intake. Malnutrition is used to refer to a number of diseases, each with a specific cause and related to one or more nutrients (for example, protein, iodine or calcium) and each characterized by cellular imbalance between the supply of nutrients and energy on the one hand, and body’s demand for them to ensure growth, maintenance and special functions, on the other. According to WHO an estimated 334 million children in developing countries are malnourished while in the same region 6.6 million out of 12.2 million deaths of children under-five are associated with malnutrition. WHO states further that: overall malnutrition must no longer be considered without reference to micronutrient status, as the two are inextricably linked. Attempting to improve protein-energy status without addressing micronutrient deficiencies will not result in optimal growth and function. (WHO, 1996).

39. During the International Conference on Nutrition that adopted a section on “Promoting appropriate diets and healthy lifestyles” governments were called upon, “... to provide advice to the public by disseminating, through the use of mass media and other appropriate means, qualitative and/or quantitative dietary guidelines relevant for different age groups and lifestyles and appropriate for the country’s population. During a subsequent expert consultation, convened by WHO and FAO in 1995, recommendations for the development and implementation of food-based dietary guidelines (FBDG) were made. Advantage of food based dietary guidelines is that local consumption patterns are respected in setting the guidelines. In order to evaluate dietary quality in existing Reference Nutrient Intake (RNI) values per unit of energy needs to be expressed with the diet.

40. The value of vegetables goes beyond the provision of necessary vitamins, minerals, micronutrient and, in a number of cases, protein. Evidence associates a lower relative risk of age-related blindness due to macular degeneration with the consumption of dark green leafy vegetables, particularly spinach and collard (FAO, after Seddon et al. 1994). Diets that are rich in fruits and vegetables are further associated with various positive outcomes such as reduced incidence of lung cancer. Food variety is appreciated for ensuring essential nutrient adequacy or decreasing the risk of food toxicity. In recent years, food variety has also been used as a predictor of health and there is enough evidence to justify promoting food variety through FBDG as a technique to reduce morbidity and mortality even though the exact functioning of it is not known.

41. There are a number of studies that illustrate that consuming more fruits and vegetables reduces the risk of certain chronic maladies, including coronary artery disease, diabetes and several cancers and probably leads to prolonged life expectancy, provided other health conditions are met.

42. At the recent International Congress on Vegetarian Nutrition, held at California’s Loma Linda University, research papers included some encouraging findings. A predominantly vegetarian diet may have beneficial effects for kidney and nerve function in diabetics. Eating more fruits and vegetables can slow down and perhaps reverse age-related declines in brain function and in cognitive and motor performance.

43. The above more than justifies the promotion of the consumption of vegetables for public health reasons in both countries with food shortages and food abundance. Recommendations in food dietary guidelines, as expected, always include recommendations on consumption of fruits and vegetables.

44. The sources of vegetables used as food varies according to the socio-economical context and can originate from one of the following categories: wild vegetables collected from spontaneous vegetation; wild vegetables growing as spontaneous weeds amongst other cultivated plants; home gardens in rural areas, small-scale intensified urban and peri-urban gardens; large-scale commercial production units.
Besides the nutritional value of vegetables, increased interest is being given to the functional benefits of vegetables and their therapeutic benefits to human health.

45. Recent epidemiology studies have established the positive correlation between the consumption of certain food items and the reduction in the occurrence of certain cancers. The carotenoids are a class of isoprenoid compounds which are highly unsaturated and therefore with a high capture capacity of free radicals which have anti-cancer properties. The carotenoids family form an important share of the micro-nutrients with important functions from a human nutrition point of view.

46. Fruits and vegetables contain different types (over 600) of carotenoids in different quantities. The recommended daily allowance of β-carotene, the precursor of vitamin A, ranges from 5000 to 25000 International Units (I.U.). Carrots, sweet potatoes and leafy vegetables contain high levels of β-carotene, usually exceeding 8000 I.U. per 100g and can therefore cover the recommended daily intakes.

47. There is interest in the role of nutrition in the prevention and pathogenesis of cancer: extensively conjugated biomolecules such as carotenoids act largely on physical quenching of \( ^1 \text{O}_2 \) and are thus essential to cancer prevention (Yamaguchi et al., 1999). Carotenoid intakes, including supplements, have been implicated as protective factors against a wide variety of human cancers (Krinsky and Sies, 1995; Mayne, 1996) (Table 2).

Table 2. Organs that may be protected against cancer by carotenoids (Olson, 1999).

<table>
<thead>
<tr>
<th>Organ</th>
</tr>
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<tbody>
<tr>
<td>Lung</td>
</tr>
<tr>
<td>Oral cavity, pharynx and larynx</td>
</tr>
<tr>
<td>Oesophagus and stomach</td>
</tr>
<tr>
<td>Colon and rectum</td>
</tr>
<tr>
<td>Breast</td>
</tr>
<tr>
<td>Prostate</td>
</tr>
<tr>
<td>Cervix</td>
</tr>
<tr>
<td>Skin</td>
</tr>
</tbody>
</table>

Some carotenoids are precursors of vitamin A (\( \text{all-trans}-\text{retinol}, \ C_{20}H_{30}O \) which has an antixero-phthalmic effect and has been associated with a reduction in cancer risk (Colditz et al., 1985; Ziegler, 1989).

48. Despite lycopene having no provitamin A activity, this specially unsaturated carotenoid presents very particular health effects. Increasing clinical evidence supports the role of lycopene as a natural antioxidant with important health benefits, since it appears to provide protection against a broad range of epithelial cancers. Tomatoes and tomato-based foods are the major source of lycopene compounds, and are also considered an important source of carotenoids in the human diet. Undesirable degradation of lycopene affects the health benefit: the main causes of tomato lycopene degradation during processing being isomerization and oxidation.

49. Real health effects of carotenoids might be cleared and Table 3 reports on some possible chemical ways to explain health effects of these class of molecules.

Table 3. Possible protective mechanisms of carotenoids against chronic diseases (Olson, 1999).

<table>
<thead>
<tr>
<th>Mechanism</th>
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<tbody>
<tr>
<td>Quenching of singlet oxygen</td>
</tr>
<tr>
<td>Scavenging of peroxyl radicals</td>
</tr>
<tr>
<td>Modulation of carcinogen metabolism</td>
</tr>
<tr>
<td>Inhibition of cell proliferation</td>
</tr>
<tr>
<td>Enhancement of cell differentiation via retinoids</td>
</tr>
<tr>
<td>Stimulation of cell-to-cell communication</td>
</tr>
<tr>
<td>Enhancement of the immune response</td>
</tr>
<tr>
<td>Filtering to blue light</td>
</tr>
</tbody>
</table>

50. Other chronic diseases: a large number of health effects were found in literature such as:
- cardiovascular disease (Mayne, 1996),
- age-related macular degeneration (Snodderly, 1995),
- cataracts (Krinsky and Sies, 1995),
- HIV infections (Santamaria, 1995).

51. β-carotene-rich foods are effective in eliminating vitamin A deficiency. The evidence, however, leans toward β-carotene-rich fruit and vegetable intake improving vitamin A status in deficient children and women (Nestel and Trumbo, 1999).

It is of a prime importance to know that:
- vitamin A is more effective than β-carotene in preventing vitamin A deficiency, many factors affecting the bioconversion of β-carotene (de Pee and West, 1996),
- increasing the consumption of fruits and vegetables that are widely available in developing countries is a viable and sustainable approach to preventing vitamin A deficiency, especially where coverage of pharmaceutical supplements and vitamin A-fortified foods are limited. The RDA for vitamin A for children between one and 10 years old is 400 RE (retinol equivalent) (FAO/WHO, 1988).

52. Heinonen et al., 1989 (Table 6) exhibits the equivalence between some of the vegetables consumed and total carotenoid contents provided.

Table 6. Total carotenoids and vitamin A activity in vegetables and leafy vegetables (Heinonen et al., 1989).

<table>
<thead>
<tr>
<th>Vegetables</th>
<th>Content (µg/100g of fresh products)</th>
<th>REa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrot</td>
<td>8430</td>
<td>1300</td>
</tr>
<tr>
<td>Cucumber</td>
<td>600</td>
<td>22</td>
</tr>
<tr>
<td>Tomato</td>
<td>4030</td>
<td>120</td>
</tr>
<tr>
<td>Red pepper</td>
<td>2900</td>
<td>480</td>
</tr>
<tr>
<td>Dill</td>
<td>11200</td>
<td>750</td>
</tr>
<tr>
<td>Watermelon</td>
<td>4500</td>
<td>140</td>
</tr>
<tr>
<td>Broccoli</td>
<td>2824</td>
<td>170</td>
</tr>
<tr>
<td>Brussels sprouts</td>
<td>1450</td>
<td>71</td>
</tr>
<tr>
<td>Parsley</td>
<td>15800</td>
<td>940</td>
</tr>
<tr>
<td>Spinach</td>
<td>7700</td>
<td>550</td>
</tr>
<tr>
<td>Lettuce leaf</td>
<td>2780</td>
<td>160</td>
</tr>
<tr>
<td>Celery</td>
<td>10100</td>
<td>490</td>
</tr>
<tr>
<td>Caruru (Amaranthus viridis)</td>
<td>39950</td>
<td>-c</td>
</tr>
</tbody>
</table>

a micrograms of RE/100 g (retinol equivalent = vitamin A), b Rodriguez-Amaya, 1999, c not determined.

53. Vegetables such as dill, carrot, tomato or watermelon are very rich in carotenoids and are thus of a high provitamin A source. In contrast to fruit, leaves have a constant qualitative carotenoid pattern, the major carotenoids being lutein, β-carotene, and violaxanthine (Rodriguez-Amaya, 1999). Less well known leafy vegetables exhibit huge values of carotenoids up to 39,95 mg per 100 grams in Caruru, a native leafy vegetable cultivated in Brazil (Rodriguez-Amaya, 1999). The bioavailability of carotenoids from leaves is known to be lower than those from fruits. On the other hand, the carotenoid contents of the former usually surpass those of the latter. Vegetable leaves are available all year round, easily produced in home gardens and are the most widely available and affordable sources of carotenoids worldwide.

World trends in production and supply of vegetables

54. The current production and consumption of vegetable still widely varies according to continents and countries as illustrated in table below. It should be noted that the production of wild and indigenous vegetables is not taken into account in production statistics and might be underestimated in consumption statistics.
WORLD PRODUCTION AND SUPPLY OF VEGETABLES

<table>
<thead>
<tr>
<th>Year</th>
<th>1979</th>
<th>2000</th>
<th>1979</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>326,616</td>
<td>691,894</td>
<td>66.1</td>
<td>101.9</td>
</tr>
<tr>
<td>Africa</td>
<td>22,630</td>
<td>45,546</td>
<td>45.4</td>
<td>52.0</td>
</tr>
<tr>
<td>North and Central America</td>
<td>34,273</td>
<td>52,179</td>
<td>88.7</td>
<td>98.3</td>
</tr>
<tr>
<td>South America</td>
<td>11,568</td>
<td>19,598</td>
<td>43.2</td>
<td>47.8</td>
</tr>
<tr>
<td>Asia</td>
<td>161,661</td>
<td>477,210</td>
<td>56.6</td>
<td>116.2</td>
</tr>
<tr>
<td>Europe</td>
<td>64,073</td>
<td>93,905</td>
<td>110.9</td>
<td>112.5</td>
</tr>
<tr>
<td>Oceania</td>
<td>1,684</td>
<td>3,456</td>
<td>71.8</td>
<td>98.7</td>
</tr>
<tr>
<td>Developed countries</td>
<td>141,938</td>
<td>161,800</td>
<td>107.4</td>
<td>112.8</td>
</tr>
<tr>
<td>Developing countries</td>
<td>184,679</td>
<td>530,094</td>
<td>51.1</td>
<td>98.8</td>
</tr>
</tbody>
</table>

55. The average vegetable supply available per person in the world is 102 kg per person per year with the highest level in Asia (116 kg) while the lowest level is found in South America (48 kg) and Africa (52 kg).

56. The world production of fruits and vegetables was estimated 1158 million ton in 2000 of which 691 million ton consists of vegetables. These figures reflect also the large amount of horticultural produce that is consumed domestically.

57. In industrialized countries, up to 30 percent of people suffer from food-borne illnesses every year. An estimated 70 percent of the approximately 1.5 billion annual cases of diarrhoea in the world are caused by biological contamination in foods. Contaminated food plays a major role in the epidemiology of cholera and other forms of epidemic diarrhoea, substantially contributing to malnutrition. The incidence of food-borne diseases may be 300 to

\[2 \times 10^3 \text{ MT can be contributed to the states belonging to the USSR till 1992.}\]

\[3 \times 21,500 \times 10^3 \text{ MT can be contributed to the states belonging to the USSR till 1992.}\]
350 times higher than the number of reported cases worldwide. Public concern over food safety has increased dramatically in the last five years. Internationally accepted, science-based food standards are critical to protect public health. These standards are also evolving to address consumer concerns about new products such as genetically modified foods. Consumers have become concerned about the “traceability” of the products they consume and the different operations involved in reaching the final product. *A farm-to-consumer approach to food production, processing and preparation can control contamination at every link in the food chain.*

58. Since 1963, an international food code has been in place to ensure food quality and safety worldwide. Codex Alimentarius, jointly administered by FAO and the World Health Organization, sets standards for pesticide and veterinary drug residues, additives, food imports, inspections and food sampling methods, among other issues. It serves as the basis for many national food standards. Codex has established such well-known safeguards as the “Best if used before” food label and definitions for low-fat and light food.

59. Of specific concern to the developing countries is the microbial contamination resulting from poor hygiene, frequently because of lack of access to clean water. It is a major source of illness, especially among children. Misuse and excessive use of pesticides sometimes lead to dangerously high residue levels in food. Where inspection systems are weak, countries are vulnerable to dumping of unsafe food by unscrupulous traders. Exports of poor-quality food to developed countries can lead to rejection of shipments, depriving the exporting countries of foreign exchange and causing hardship in farming communities.

60. Among countries, there are big differences in food safety standards. With the liberalization of international trade, the tariff rates of agricultural products are decreasing, but the green barrier is being built up. Food safety standards are getting stricter, and testing methods and facilities more complex.

61. Different governments have promulgated control standards for food safety in the form of laws and regulations that are well enforced. FAO is keeping a database of Maximum Residue Levels (MRLs), established by the Codex Committee on Pesticide Residues and food standards as well as other documents elaborated by the various Codex Committees.

(i) chemical safety: The Codex provides for MRLs, as far as pesticides residues are concerned, and a general standard regarding the contamination of food products (heavy metals and other contaminants)

(ii) microbiological contamination of fruits and vegetables. A draft code of hygienic practices for fresh fruits and vegetables (Alinom 03/13, appendix II, with annexes for ready to eat precut fruits and vegetables and sprout production), is due for adoption as a final text by the CAC in 2003. This complements the already existing general principles of food hygiene.

(iii) commercial quality: A large number of standards have been produced.

62. It should be realized that many developing countries still lack the scientific capabilities and do not have access to the technologies for precision measurement of food safety.

If countries have different safety standards, the SPS Agreement of WTO defines Codex standards as the reference in case of international dispute, and encourages countries to harmonise their phytosanitary measures on the basis of Codex standards when they exist.

**Guidelines for on-farm production practices are essential for ensuring product quality at the farm gate**

63. As a result of the Green Revolution, intensified agriculture systems have lead to the overuse and often misuse of large quantities of pesticides, herbicides, chemical fertilizers and urban organic wastes, including stable manure with different kinds of additive residues from feed. All these factors, plus environmental pollution of air, soil and water, are seriously affecting food safety. To maintain the people’s health and ensure the quality and safety of the food for local supply and export, guidelines are to be developed and disseminated and adhered too. *Therefore, the entry point to improving food safety would be to train farmers on the application of good agricultural practices (GAP) with considered use of pesticides and other inputs. In this context FAO’s global IPM facility aims at introducing Integrated Production and Pest Management (IPPM) as a means to ecologically sound production systems.*

64. The “Green Food” concept launched in China at the beginning of 1990 has become a real success. Green food is basically characterized by non-contamination, safety, good quality and nutritional value. Green food production
is based on a series of requirements for the environment and the production practices to be complied with. Chemicals and other kinds of toxic and harmful means of production are prohibited or are constrained. Quality control and monitoring of green food from farmland to dinner table are carried out. In this way, the ecological environment could be protected, food safety could be safeguarded, and sustainable agriculture could be developed. A framework of “green food” quality and standards has been elaborated, covering a series of aspects such as environment of production areas, production process, product quality, processing, packaging and storage. The first trademark "green food logo" was registered in China, and it is also registered in Hong Kong and Japan. The amount of green food supplied has been steadily increasing. Vegetables presently account for 17% of the consumption of green food products, fruits 8%, livestock and poultry products and dairy products 15%.

In the strive for quality, organically produced vegetables may offer valuable opportunities for selected niche markets

65. Currently there is, in a growing number of countries, legal protection for one specific type of environmental standard which is organic. Organic certification as such is not a product certification but process certification. It comes in addition to existing food safety requirements and does not replace them.

66. During the second half of the 1990s, a strong and steady growth in the sales of organic foods provided these products with a viable and sometimes value added market niche. Changes in dietary habits among many segments of the population of developed countries - resulting from increased health awareness and the increasing demand for a wider variety of products, including convenience food - have contributed to this growth. Due to major food scares, which hit many countries in western Europe in the late 1990s and start of this century, consumers in general have become more critical when purchasing food. Moreover, they have become more demanding regarding information on production and processing aspects. The sales of organic horticultural products have expanded rapidly in many of the major organic markets (e.g. the United States, countries in the European Community and Japan). However, the market share of organic products in total food sales is still small, with shares ranging between one and three percent.

67. The economies of many developing countries are dependent on the export of a relatively restricted number of agricultural commodities. Several of these commodities are likely to face further market liberalization pressure in the near future.

68. Despite ongoing conversion towards more sustainable farming methods in developed countries and government support to further boost organic production, consumption of organic foods is expected to continue to outgrow domestic production in developed countries, leaving room for significant organic imports, at least in the short- to medium-term and probably beyond. Moreover, tropical and off-season products will continue to provide an attractive potential for which many developing countries have comparative advantages.

69. The highest values of total organic food sales in 2000 were found in the United States (US$8000 million), followed by Germany (US$2100 million), the United Kingdom and Italy (US$1000 million). Other high sales values were found in France (US$850 million) and Switzerland (US$450 million). The United States and European markets have roughly the same size. Sales of certified organic products in Japan were estimated at only US$350 million in 2000, but total sales of "green" products (produced with less but not necessarily without chemicals) are estimated at US$2.5 billion.

70. Market surveys indicate fast growth in sales of organic fruit and vegetables in most developed countries. Sales values were found to increase in most markets at annual rates generally ranging between 20 and 30 percent during the last years of the 1990s. The share of organic sales in the fruit and vegetable sector is somewhat higher than the share of organic sales in total food sales. In most countries, organic shares in fresh fruit sales are estimated at about three to five percent, whereas for vegetable sales the organic shares are estimated at up to ten percent in the United Kingdom and Switzerland for example, partly due to the high sales volume of domestically produced organic vegetables through direct sales and box schemes. A recent publication released by FAO “World market for organic fruit and vegetables”, illustrates and substantiates the current trends and potentials.
Vegetables are renowned for their short cycle, and high value providing a valuable source of income leading to improved livelihood. Vegetables play an expanding role in the countries’ food security strategy and derived health benefits for the less endowed.

71. Where farmers have better yields by growing cereals, they are no longer poor and hungry. When they shift to horticulture, by growing vegetable and fruits, they can get more income and this will reflect on a better diet, education and livelihood of the family. In Kenya, the income of $1 a day has been raised to US $3 and 4 a day for those farmers who have been successful in diversifying their agriculture partly or entirely towards horticulture.

72. It is well known that vegetable growing for home consumption and neighbourhood marketing has become a survivor activity for millions of small-scale growers who live in the poor urban and peri-urban areas. As a result of the socio-political context and a phenomenon of the economic development process many people have migrated towards the cities. In view of their rural background and the difficulty of access to other income earning activities, a great number of them are squatting on small pieces of land and growing vegetables for home consumption and for sale. Areas cultivated are generally quite small and may range from one to several square meters. Leafy vegetables are particularly popular for their fast growth. However, whenever enough space is available diversification towards high value fruit and tuber vegetables is occurring. It is not uncommon to see families that survive on 100 square meters of intensive gardening. From small areas of 250 to 500 square meters, growers can obtain income equivalent to the local wages for temporary labour.

73. The demand for a year round supply of fresh products especially in wealthier nations has led to an increase in international trade and the increased importance of horticul tural produce and commodities in developing countries. At the same time, the development of post harvest technologies has been important in facilitating this increase in trade.

74. The world production of fruits and vegetables was estimated 1,158 metric tons in 2000 of which 692 metric tons consists of vegetables. Exports of fresh and processed vegetables rose from 19.7 million tons in 1990 to 32 million tons in 2000. The 32 million tons in 2000 represented 4.6% of total vegetable production. The exported value was US $22 billion of which US $4.6 billion were accounted for by exports of tomato and tomato products. Asparagus, mushrooms, chillies, peppers and green beans give a high value per kg., while diverse processed products can also have a high value per kg. (Source: FAOSTAT).

75. These figures reflect also the large amount of horticultural produce that is consumed domestically. To understand the importance of horticultural production in a national setting, we should also consider the diversity in horticultural crops and production systems enables them to contribute to income and employment generation in many different socio-economic and agro-ecological settings in the world. Horticultural production in the form of household gardens is regarded as a way to contribute to food security and nutrition and be an important livelihood strategy for a part of the population in a number of developing countries. This form of production is generally considered as subsistence farming and the actual output is difficult to quantify.

76. Household gardening is regarded as a way to contribute to food security and nutrition for a part of the population in a number of developing countries. This form of production is generally considered as subsistence production and the actual output is difficult to quantify.

- The annual yield of Indonesian village gardens has a cash value equal to 60% of the annual rice production⁴;
- Research in Peru revealed that in one lowland tropical region, gardens, intercropping of field margins and gathering provide most vegetables consumed on a regular basis, as well as virtually all meat raised on kitchen waste and foraging⁵.

Food gardening is common and economically important even in highly developed countries. US victory gardens in 1944 produced 40% of the nation’s fresh produce. In 1981 a Gallup poll found North Americans producing over $1 billion worth of food in backyards;

In China, private family gardens established on 8% of the arable land and limited to 45 m² per person produce 21% of the country’s vegetables, poultry and swine (Bittenbender, 1985);

Home gardening and subsistence agriculture was estimated to provide almost 40% of Russia’s agricultural output;

77. Horticultural micro-enterprise production systems in urban and peri-urban environments. Going beyond subsistence production, horticultural production has proved to be an economic activity that can be pursued by resource poor households without high capital investment in areas surrounding cities and sometimes within city boundaries. Examples of successful horticultural micro enterprises are market gardens can be found within and around cities like Beijing, Kinshasa, Dakar, Nairobi and Santo Domingo; and also cottage industry mushroom production in Asia (Nepal, India and Bhutan. Small-scale commercial horticulture is an attractive activity for the resource poor urban population since it requires relatively little inputs, while the output can have a medium to high value.

Food safety issues in horticultural production in the context of international trade

78. In developing countries, contaminated food plays a major role in the epidemiology of cholera and other forms of epidemic diarrhoea, substantially contributing to malnutrition. The incidence of food-borne diseases may be 300 to 350 times higher than the number of reported cases worldwide. Even in industrialized countries, up to 30 percent of the population suffer from food-borne illnesses every year. On a global level, an estimated 70 percent of the approximately 1.5 billion annual cases of diarrhoea in the world are caused by contamination in foods. Public concern over food safety has increased dramatically in the last five years especially since the occurrence of the BESS and the Dioxin contaminated chicken. Internationally accepted, science-based food standards, are critical to protect public health. These standards are also evolving to address consumer concerns about new products such as genetically modified foods. A farm-to-consumer approach to food production, processing and preparation can minimise the risk of contamination at every link in the food chain.

79. Moreover, the need to adhere to the international food safety standards, as defined in the Codex Alimentarius, international trade more and more depends on the adherence to and certification in line with other international standards. The most well known ones are ISO and HACCP, mostly applicable to food processing and less to primary production. However, food processors and retailers in different parts of the world try to increase their control over the farm production process. In this, they are encouraged by consumer concerns on food safety and demand for traceability of products. An example of this is the Eurep GAP initiative of supermarket chains in Europe. Similar trends can be found in Australia and the USA.

80. Other standards are environmental and/or social standards, built on the concept that certain groups of consumers are willing to pay more for produce produced according to standards that benefit the environment or the social circumstances of the producers. Examples of these are organic standards and the different types of fair trade standards as well as combinations of these. While organic standards have reached a legal status in an (increasing) number of countries, fair trade standards are less formally established.

81. The incorporation of these different types of standards in the horticultural production chain takes different forms in different countries. It should be realized that in many developing countries it is difficult to keep up with the growing technical sophistication and cost of certification arrangements. While with the liberalization of international trade, tariff rates of agricultural products are decreasing, there is concern that market access is becoming more restricted for a number of producers due to the increasing amount of private sector standards.

Food and nutrition security, besides being a goal in itself, has much larger implications and has to be seen as a contribution to a much broader goal and concept which is improved human well-being and security.

References:


82. The lack of action in the fight against hunger may have arisen from a belief that success in poverty reduction, resulting from market-driven economic development, would "automatically" take care of the problem of hunger. However, this thinking does not take into account three points: first, poverty reduction takes time, while the hungry need immediate relief; second, in contrast to many diseases for which cures are either unknown or unaffordable, the means to feed everyone are readily and cheaply available; and third, hunger is as much a cause as an effect of poverty. Unless hunger is reduced, progress in cutting poverty is bound to be slow. A direct attack on hunger will greatly improve the chances of meeting the other Millennium Development Goals, not only for poverty reduction, but also those related to education, child mortality, maternal health and disease.

83. Hungry children cannot grow and learn. Hungry adults cannot perform hard physical labour, they fall sick more often and are more likely to die young. They are also unwilling to undertake potentially profitable but riskier investments for fear of the consequences of failure. Even worse, hunger perpetuates itself when undernourished mothers give birth to smaller babies who start life with a handicap. A vicious cycle of hunger and poverty is thus created, from which it is difficult for the poor and the hungry to escape without external help.

84. However, if the cycle were broken, the benefits would be enormous. A rough measure of these benefits is given by the value of the longer and healthier lifespan that would be enjoyed by those who were no longer undernourished, as well as by the general population because it would be better nourished. Preliminary estimates suggest that, if the WFS goal of 408 million undernourished people by 2015 is achieved, instead of the 610 million that will result if "business as usual" continues, the value of the extra years of healthy life should be more than US$120 billion per year. This is a conservative estimate of the full economic benefits of meeting the goal. In other words, agricultural and rural development in support of hunger reduction has important overall beneficial effects on the economy by creating demand for goods and services, both domestically produced and imported. Similar calculations in the report of the World Health Organization Commission on Macroeconomics and Health suggest gains from improved nutrition and health of hundreds of billions of dollars per year if the goal can be met. Thus, fighting hunger is not only a moral imperative, it also brings large economic benefits.

85. Success in reducing hunger is also likely to produce large benefits in terms of sustainable development. The economic prosperity resulting from hunger reduction should create demand for sustainable use of the environment and of common property resources. This point takes on added resonance this year with the World Summit on Sustainable Development held in Johannesburg, South Africa in September 2002.

86. Finally, while few would dispute that hunger reduction benefits poor countries, the rich countries also stand to gain, as their own welfare is closely linked to that of the less fortunate countries. Better nourishment in the poor countries is likely to increase their incomes, thereby creating a new source of demand for the products of the developed countries. Better nourishment may also reduce the likelihood of conflict. Lifting people out of hunger, the most extreme form of poverty and deprivation, makes it less likely that they will be easy prey for those who seek to promote their own self-interest through conflict and civil strife. Apart from contributing to global stability, hunger reduction should reduce the world's expenditure on conflict prevention and rehabilitation of war-torn areas. A study by the United States Agency for International Development found that meeting the WFS target would lower the cost of peacekeeping and humanitarian operations by about US$2.5 billion per year.

87. Therefore, halving hunger is not only a valid goal in itself, but is also closely linked to the achievement of other key goals set by the international community, most of which are reflected in the Millennium Declaration.
Annex: Declaration of the World Food Summit: five years later

International Alliance Against Hunger
We, the Heads of State and Government, or our representatives, assembled in Rome at the World Food Summit: five years later (WFS:fyl) at the invitation of the Food and Agriculture Organization of the United Nations (FAO);

Recalling the World Food Summit (WFS) held in Rome in November 1996 at which Heads of State and Government, or their representatives, adopted the Rome Declaration on World Food Security and the WFS Plan of Action and pledged their political will and their common and national commitment to achieving food security for all and to an ongoing effort to eradicate hunger in all countries, with an immediate view to reducing the number of undernourished people to half their level no later than 2015;

Recognizing the urgent need to reinforce the efforts of all concerned partners as an international alliance against hunger, for the fulfilment of the objectives of the 1996 Summit;

Reaffirming the right of everyone to have access to safe and nutritious food;

Reiterating that food should not be used as an instrument for political and economic pressure and reaffirming the importance of international cooperation and solidarity as well as the necessity of refraining from unilateral measures not in accordance with the international law and the Charter of the United Nations and that endanger food security;

Reaffirming the commitments that we assumed with the Rome Declaration and Plan of Action, which taking into consideration the multifaceted character of food security, encompass national action and effective international efforts to supplement and reinforce national action;

Acknowledging the considerable efforts which have been made in many countries to reduce poverty and improve food security, and recognizing the commitment of the international community to assisting this effort as expressed in the United Nations Millennium Declaration;

Noting that the average annual rate of reduction in the number of undernourished people in the world was eight million and that if this trend continues, the WFS target of reducing the number of the undernourished by half by 2015, reaffirmed by the Millennium Declaration, will not be attained;

Noting that hunger is both a cause and an effect of extreme poverty, and prevents the poor from taking advantage of development opportunities, that hunger eradication is a vital step in alleviating poverty and inequality, and that the international community has restated its commitment to the reduction of poverty. Observing further that 70 percent of the world's poor live in rural areas and depend almost entirely on agriculture and rural development for their livelihood; and noting the rapid increase in the numbers and proportion of urban people affected by poverty, hunger and malnutrition;

Conscious of the particular difficulties faced by all developing countries, in particular by the least developed countries (LDC), the low-income food-deficit countries (LIFDC), the small island developing states, and countries affected by violent conflicts, civil strife, land mines and unexploded ordnance, or exposed to desertification and natural disasters; noting further that global warming and climate change can have serious implications for food and livelihood security, especially in these countries;

Recognizing also the difficulties faced by the countries with economies in transition in addressing their food security needs in the process of conducting market-oriented reforms;

Concerned with the current estimates of the overall downward trend in the national budgets of developing countries and the decline in Official Development Assistance (ODA) and International Financial Institutions (IFIs) portfolios directly allocated for agriculture and rural development, as a contribution to food security;

Recognizing the important role of food assistance in situations of humanitarian crisis as well as an instrument for development, acting as an enabling pre-investment;
Reaffirming Commitment 4 of the WFS Plan of Action that trade is a key element in achieving world food security;

Reaffirming the fundamental importance of national production and distribution of food, sustainable agriculture and rural development, fisheries and forestry, in achieving food security;

Reiterating our deep concern at the debt burden on developing countries in particular the heavily indebted poor countries, and at its negative impact on resources for food security, inspite of progress in implementing the Heavily Indebted Poor Countries (HIPC) initiative;

Recognizing that international economic and financial crises have shown dramatically the vulnerability of developing countries;

Noting with concern the acute threat of the HIV/AIDS pandemic, and the incidence of malaria, tuberculosis and other diseases, in particular those caused by water contamination in developing countries, and their devastating impact on food security;

Reaffirming our commitment to the Monterrey Consensus, which referenced the need to develop effective partnerships between developed and developing countries, based on the recognition of national leadership and ownership of development plans that embody poverty reduction strategies, and recognizing the value of exploring innovative sources of finance provided that those sources do not unduly burden developing countries, as important steps towards achieving sustainable food security;

Recognizing the importance of the International Treaty on Plant Genetic Resources for Food and Agriculture in support of food security objectives;

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