

Food security and the role of domestic agricultural production

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SUMMARY AND CONCLUSIONS

1. Food is the most important product as it is indispensable for the maintenance of human life and health. Everyone must have access to food and every government is responsible for ensuring a food supply sufficient for its people.
2. More than 800 million people, mostly in developing countries, currently suffer from undernourishment. The lack of foreign exchange in LDCs and NFIDCs hampers access to food in the Third World.
3. There are a number of factors affecting short-term instability of food supply and demand, which may increase in future: a low share of trade volume compared with production, international market dominated by a small number of countries, diminishing level of stockholding etc.
4. The increasing world population and changes in dietary habits will increase demand for food. On the other hand, there are a number of constraints on increases in production, including the limitation on land and water resources, soil degradation and desertifications, various environmental concerns, etc. While there are strong concerns among consumers in importing countries over the future prospect of food supply, the current WTO rules lacks adequate disciplines on export measures.
5. Imports from a diversity of countries would contribute to reduce the risk of poor harvest in a certain exporting country, while there is always a risk of import interruption concerning transportation. Domestic production serves as an insurance against these risks associated with imports, but also has its own risk of unstable production. Stockholding is an effective measure for sudden food shortages, but it is effective only in a short run. The optimum combination of the above three means is essential in order to attain food security effectively at the lowest cost.
6. The optimum solution for each country varies according to its specific situation and cannot be found by relying only on market mechanism. In order to find this optimum solution, external effects and public goods aspects of food security as well as the element of risk (uncertainty in supply) must be fully taken into account.
7. Also, in examining the cost-efficiency of maintaining/increasing domestic production for food security, other multi-functions of agricultural activities (such as land conservation, fostering water resources, protection of the environment, strengthening socio-economic viability and the development of rural areas, preservation of landscapes and traditional cultures) should be properly taken into consideration.
8. Each country has a right to pursue the optimum combination of domestic production, importation and public stockholding to ensure its food security. A desirable international framework should allow countries to pursue their respective goals based upon their specific situations, through an appropriate combination of WTO consistent measures.
9. The committed reform process based on Article 20 should cautiously proceed so as to enhance food security for all the Members, including ensuring sustainable domestic production, access to stable and predictable world market and the diversity of resources of food imports.
10. At the same time, the problem and needs of developing countries should be duly taken into consideration and properly reflected in the outcome of the WTO negotiations.

1. DEFINITION AND ELEMENTS OF FOOD SECURITY

1.1. Definition by the World Food Summit

11. Food is, as everybody knows, the most important product, as it is indispensable for the maintenance of human life and health. Everyone must have access to food and every government is responsible for ensuring a food supply sufficient for its people.

12. The demand for major agricultural commodities (basic food) is, in economic terms, inelastic; consumers will buy a certain amount of food more or less regardless of price, provided they can afford to.

13. The supply of agricultural products is, in the short term, price inelastic; agricultural productions cannot respond quickly to price signals mainly due to the necessary time lags of production. In addition, there are high possibilities of considerable fluctuations in food supply since agricultural production depends on such exogenous factors as natural conditions and climatic phenomena.

14. In the case of basic foods, the market prices and farmers' incomes are especially unstable. The ever-lasting concerns for food security reflect the high volatility in prices for agricultural commodities and uncertainties in food supplies.

15. In recognition of the importance of food security, FAO hosted a summit meeting in 1996 to secure sustainable food security. This World Food Summit adopted its Plan of Action calling for international co-operation. The Plan of Action gives the following definition of food security: "*Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.*"

1.2. Elements of food security

16. Availability of Food: According to the above definition of food security, sufficient food supply should be secured in a sustainable manner, in response to the growing world population and changing dietary habits.

17. Accessibility to Food: Food security can be attained only when physical and economic access to food is secured. While physical accessibility to food will be affected by unforeseen events such as wars, export embargoes/restrictions, economic accessibility will be hindered by factors such as lack of purchasing power -- poverty. While the factors that determine the physical accessibility to food are common to both developed and developing countries, the factors hampering economic access are especially serious in developing countries.

18. Stability of Food Supply: Food should be supplied at reasonable prices in a stable manner. Food price tends to be unstable by nature due to the price inelasticity of supply and demand for major agricultural commodities.

19. Food Safety/Quality and Preference: The last, but not least, important element of food security is to provide food that is safe and in good quality satisfying the dietary needs and preference of consumers.

2. SITUATION CONCERNING FOOD SECURITY

2.1. Lack of access to food

20. According to an estimate made by FAO, about 790 million people in developing countries and 34 million in developed countries and in countries with economies in transition, currently suffer from undernourishment¹. Over three-fourths of undernourished people live in Asia, the Pacific and Sub-Saharan Africa, and the malnutrition in those countries co-exists with affluence in other parts of the world. Although the undernourished population all over the world is expected to decrease over the next decade, an increase is forecasted in areas such as sub-Saharan Africa.

21. The lack of foreign exchange in LDCs and NFIDCs hampers access to food in the Third World. The ratio of food imports to total merchandise imports has been increasing in such countries². Their financial resources for developing their domestic agricultural production system are also limited. Furthermore, global food aid deliveries to LDCs and NFIDCs have declined in recent years, from 17.4 million tonnes in 1993 to 8.0 million tonnes in 1998.³

2.2. Short-term instability of food supply and demand

22. In general, production of basic food has a tendency to satisfy primarily domestic demands and only the surpluses are exported. The amount of major agricultural commodities which is destined for the international market is small as compared with the total amount domestically produced. For example, the amount of wheat traded is around 18.5 % of the world's production, and in the case of rice the ratio is about 4.5 %⁴. That is one of the reasons why a fluctuation in yields in major exporting and/or large consuming countries easily affects world prices.

23. A classic example of such an experience was the sudden rise in major agricultural commodities' prices in 1972, when world agricultural production fell because of abnormal weather conditions world-wide, and the former Soviet Union's purchase of a huge amount of food from the world market further aggravated the situation. A more recent example is the large amount of grain purchase by Indonesia in face of the Asian financial crisis. The financial crisis also severely affected the Korean livestock sector, when many farmers went bankrupt due to the soaring prices of feed grains and a lack of hard currency.

24. Another feature of the agricultural trade is that a limited number of exporting countries dominate international markets (see figure 1). This concentration of suppliers makes

¹ See FAO (1999) *The State of Food Insecurity in the World*. (FAO, Rome)

² See Konandreas, P., Sharma, R., and Greenfield, J (1999) *The Agreement on Agriculture: Some preliminary assessment from the experience so far*. Paper submitted to a conference on The Uruguay Round Agreement on Agriculture: Taking Stocks, sponsored by CIIR/UK Food Group, London, 28 January 1999.

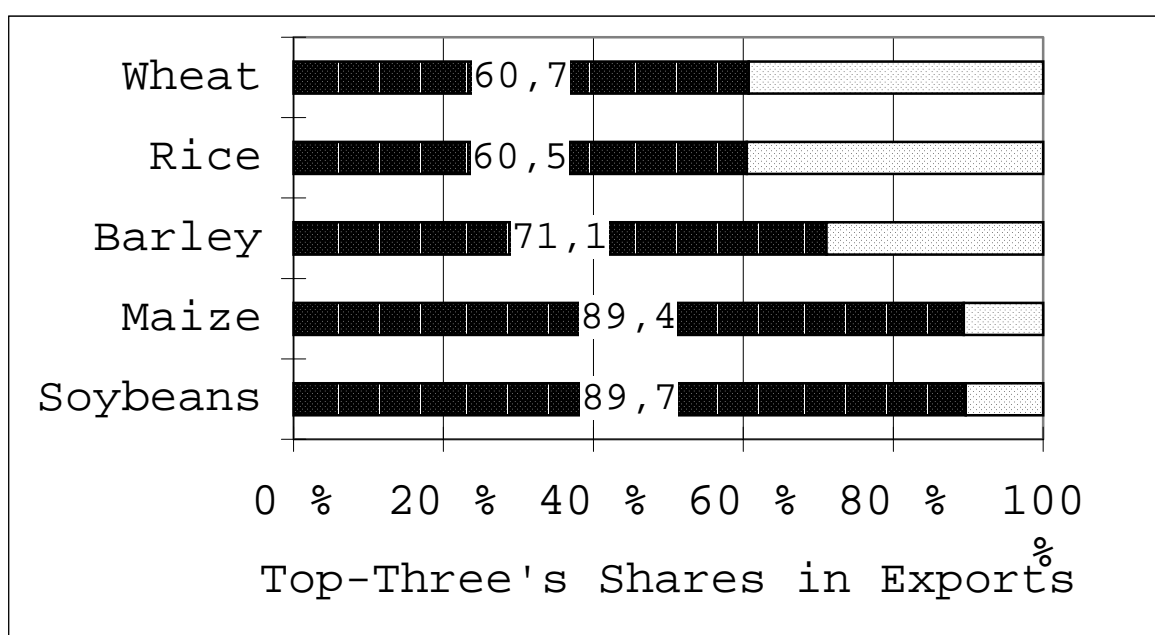
³ Monitored by WFP. See a background paper by the Secretariat of WTO Committee on Agriculture, G/AG/NG/S4, p.3, 6, for details.

⁴ Including trade of wheat flour, milled rice etc. Based on the data of 1989-98 of FAOSTAT.

fluctuations in world market prices greater in cases of abnormal weather conditions in those countries.

25. Furthermore, it has been pointed out that the level of stockholding by major exporting countries will probably continue to diminish in future. A decrease in buffer stock to address

Figure 1: Shares in Major Grains Exports by the Top-Three Largest Country/Areas in 1998(Quantitative terms).



Note: The share of the EU excludes the intra-EU trade.

Source: FAOSTAT

the risk of short-term food shortage would add another source of fluctuations in the supply and demand situation of world agricultural trade.

26. Also, in the present world market situation where major agricultural commodities are dominated by a small number of large-scale multinational 'grain majors' and export state trading enterprises ('single desk sellers'), it does not guarantee importing countries the ability to secure a stable food supply in terms of price and quantity.

27. Taking into account the factors discussed above, the short-term instability of food supplies may increase.

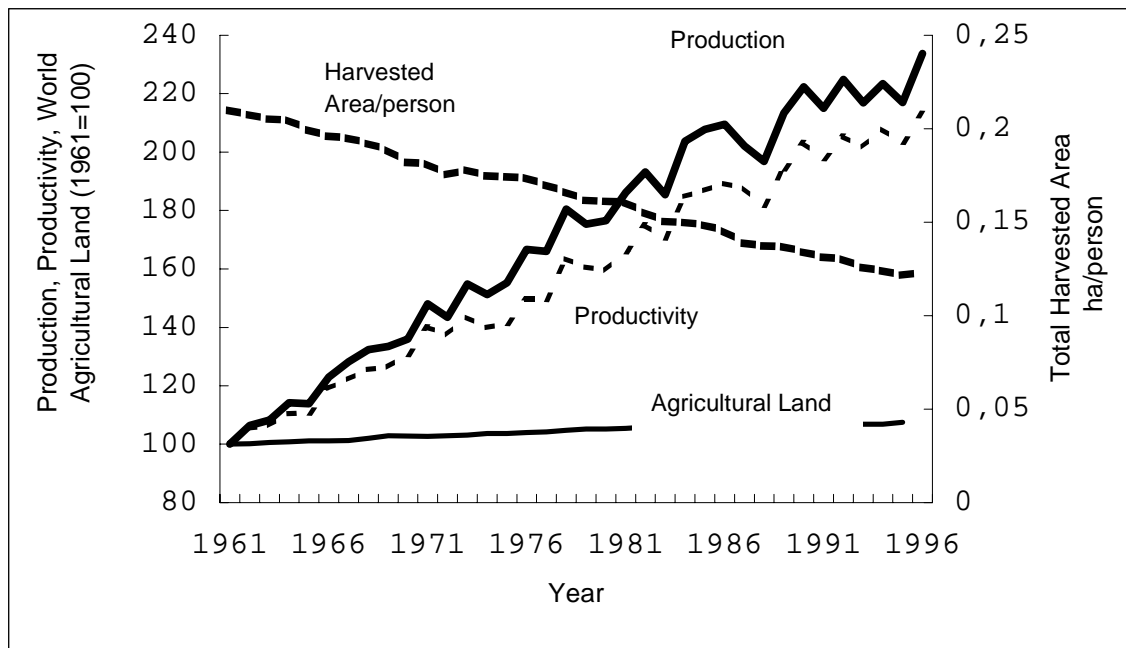
2.3. Mid and long-term trends of food supply and demand

Increasing demand for food

28. The world population is expected to increase continuously. An estimate by the UN predicts that it will reach 8 billion by 2025, and 9.4 billion by 2050. It should be noted that most of the increase in population will be seen in developing countries.

29. Current per capita meat consumption in developing countries is only 30% of that in developed countries. However, a rise in the level of income in many developing countries, particularly in China and several east Asian countries, would bring about changes in dietary habits, causing increasing demand for meat and dairy products, thus important increases in demand for feed grains. China, traditionally an exporting country of feed grains, has become a large importer in recent years.

Figure 2: Changes in Production and Productivity of Major Grains, World Agricultural Land, and Total Harvested Area per Capita between 1961 and 1996.



Note: Figures of production, productivity and world agricultural area are expressed in relative values to 1961.

Source: FAOSTAT

Various constraints on increases in production

30. World grain production doubled in three decades from 920 million tonnes in 1961-63 to 1,930 million tonnes in 1992-94. However, the agricultural land for grain production has increased only six per cent over the same period; i.e. from 1.27 billion ha to 1.35 billion ha. With the population growth, the total harvested area per capita has persistently decreased during that period. The increase in grain production is attributed primarily to the increase in productivity; the introduction of high yielding varieties, the increased use of chemical fertilisers, and improved irrigation facilities. But the growth in productivity has not been so remarkable in recent years (see figure 2).

31. FAO estimates that some 1.8 billion ha of land in developing countries is potentially available for future agricultural use. However, at the same time FAO warns that whether we can exploit fully this potentiality or not is quite uncertain for the following reasons:

- that land is unevenly located, mainly in sub-Saharan Africa and South and Central America⁵;
- the larger part is forests or nature reserves, thus may not be utilised for agricultural production; and
- two-thirds of it has problems in terms of soil and/or topography.

32. Increasing environmental concerns, especially from the viewpoint of sustainable development, should duly be taken into account when choosing production methods to increase productivity.

33. Other possible constraints for increases in production are soil degradation; desertification due to over-grazing and excessive forest exploitation; competition with other sectors in the use of water resources; and other environmental problems such as global warming, destruction of ozone layer, and acid rain.

34. It should be also noted that once abandoned, recovery of agricultural production in a short period of time is difficult, because of soil deterioration, destruction of irrigation/drainage system and irreversibility of specific know-how.

35. Although some argue there is a possibility of substantial improvement in productivity resulting from developments in biotechnology, its prospects are still uncertain and various constraints discussed above could become obstacles to reaping the benefits of modern technology.

2.4. Possibility of other crisis scenarios

36. There are several other factors which might reduce the availability of food⁶. Wars and conflicts greatly affect food supply situations both globally and regionally. Extensive radioactive fallout may occur as a result of a nuclear accident.

37. Measures by exporting countries such as embargoes and/or export restrictions threaten the food security of importing countries. A marked example was that on soybeans in 1973.

2.5. Present WTO rules/disciplines

38. Under the present WTO rules and disciplines, all the Member countries are required to commit themselves to access opportunities that are incorporated into their schedules as well as to import tariffs and tariffs quotas. The use of border measures other than ordinary customs duties (measures in GATT 1947 XI: 2(c)) is prohibited (Article 4: 2)⁷.

⁵ According to an analysis by IFPRI, Asia's farmland expansion has reached its limit and productivity also reached 90% of its potential. Source: Pinstrup-Andersen, P., Pandya-Lorch, R., and Rosegrant, M. (1997) *The World Food Situation: Recent Developments, Emerging Issues, and Long-Term Prospects*. (IFPRI, Washington)

⁶ See '*Food Security and the Role of Domestic Agricultural Food Production*', a paper submitted by Norway to Analysis and Information Exchange process in June 1999 (AIE/57).

⁷ In reality a country can be exporter and importer at the same time. Dichotomy between importing countries and exporting countries is of conceptual nature.

39. However, food-exporting countries are free to export or withhold their agricultural products, depending upon their domestic market situations. They can regulate their agricultural exports not only by raising export tariffs which are not required to be bound in schedules but also by having recourse to quantitative export restrictions/prohibitions which are not prohibited under certain conditions (GATT 1947 XI: 2(a)).

40. Against the export restrictions and prohibition measures by the exporting countries, a weak discipline is stipulated in the Agreement on Agriculture (Article 12): a Member instituting the export prohibition or restriction shall give due consideration to the effect on importing Member's food security and shall consult, upon request, with any other Member having a substantial interest as an importer.

3. MEANS TO ENSURE FOOD SECURITY AND POSITIVE ROLE OF DOMESTIC PRODUCTION

3.1. Means to ensure food security

41. In relation to food security, some argue that trade liberalisation will stabilise the global market prices, which will, in turn, contribute to attaining food security. They further claim that free trade will secure food security by creating trade gains and increase purchasing powers through economic development.

42. However, in countries which depend heavily on food imports, there are strong concerns among consumers over the fact that the future prospect of food supply and demand are not very optimistic and that there is no guarantee that so-called 'free trade' will naturally lead to the stabilisation of food supply and prices, given the present international agricultural market situations as well as current WTO rules and disciplines. Furthermore, wars and other emergencies may result in difficulties in obtaining physical and economic access to food.

43. These arguments led to the FAO Plan of Action in 1996 that states "*increased production, including traditional crops and their products, in efficient combination with food imports, reserves, and international trade can strengthen food security and address regional disparities*".

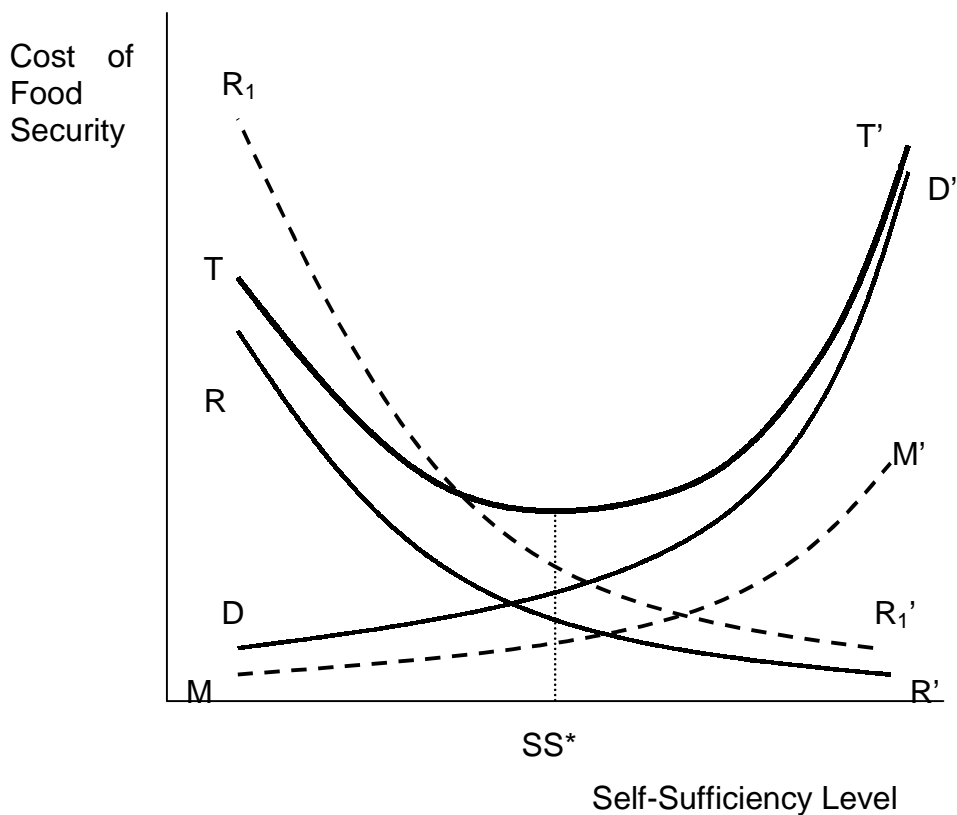
44. And this May in CSD8, countries agreed in its report as follows: "*All governments are urged to reaffirm their individual and collective commitments to achieving food security, particularly through development of domestic food production, combined with the importation, where appropriate, and storage of food, and to realising the important goal to reduce the number of undernourished people by one half by 2015, as agreed at the World Food Summit*".

45. The means for a government to secure food security are domestic production, importation and public stockholding. Imports from a diversity of countries would contribute to reduce the risk of poor harvest in a certain exporting country, while there is always a risk of import interruption concerning transportation. Domestic production serves as an insurance against these risks associated with imports, but also has its own risk of unstable production. Stockholding is an effective measure for sudden food shortages, but it is effective only in a short run. The optimum combination of the above three means is essential in order to attain food security effectively at the lowest cost.

46. The optimum solution for each country varies according to its specific situation and cannot be found by relying only on market mechanism. In order to find this optimum solution, external effects and public goods aspects of food security as well as the element of risk (uncertainty in supply) must be fully taken into account (see box).

Box: A Conceptual Illustration of Food Security

The following diagram is intended to show a conceptual illustration of food security, especially in relation with the cost to secure it. In the figure below, the horizontal axis represents self-sufficiency level and vertical axis represents cost of securing food security.



DD' : Opportunity cost incurred by domestic production of basic food, i.e. quantity of domestic production multiplied by the price difference between domestic products and imports on the assumption that an increase in imports will not affect the world market price, as well as opportunity cost by renouncing the merit of risk diversification supposing that agricultural production is equally unstable domestically and abroad (Risks/costs associated with importation of food are not considered at this stage. They are dealt with by RR' explained below). As self-sufficiency level increases, the cost increases rapidly, for more resources, including unfavourable land for production, have to be used to produce food. If the net positive externality produced jointly with agricultural production other than food security is taken into account, then the DD' shifts downwards to MM' .

RR': As self-sufficiency level declines, the risk to food security arising from import interruption/suspension increases rapidly. The cost (insurance premium) which consumers/taxpayers pay in order to avoid the risk and ensure the food security can be regarded to correspond to this risk curve. The more unstable the world market is, and the more risk-averse importing country's consumers are, then the RR' shifts upwards to R1R1'.

TT': The total cost of securing food security (sum of the opportunity cost incurred by domestic production and the risk aversion cost concerning imports; $DD' + RR'$).

- Food security will be achieved at the minimum cost at SS^* , where TT' becomes its minimum level. When the self-sufficiency level is higher or lower than this point, the cost of food security is higher.
- As pointed out in the text, in examining the cost of food security, we should take into account other positive externalities than food security which domestic agricultural activities provide jointly. This means the opportunity cost curve of domestic production is MM' , lower than DD' (supposing positive externalities are greater than negative externalities), and the total cost of food security is lower by the difference of the two curves. Also, the optimum level of food sufficiency may move from SS^* .
- If people's risk aversion preference is higher, RR' will shift to $R1R1'$, and will increase the cost of food security. Again, the optimum food sufficiency level may move from SS^*
- What will be exact features of various curves above, as well as how their changes will affect the optimum level of food security, are of empirical nature, depending on each country's conditions and the degree of risk-aversion of consumers/taxpayers.

3.2. Positive roles of domestic production

47. The sustainable utilisation of domestic agricultural resources in each country plays an important role for assuring food security, taking into consideration the fact that the prospects for expansion of farmland are limited. The maintenance of domestic agricultural production (actual and potential) alleviates people's concerns about food supply shortage in the case of unexpected events. Domestic production plays a role of insurance against risks, such as import interruptions, poor harvests in exporting countries, etc. It is important to maintain a certain level of domestic production and its potential with sustainable farming methods, along with an appropriate combination with imports and stockholding. In this context, economically less attractive but environmentally safe locations may have to continue to be used for agricultural production.

48. Domestic agricultural production not only contributes to food security but also has other multi-functions, *inter alia*, land conservation, fostering water resources, protection of the environment, strengthening socio-economic viability and development of rural areas, preservation of landscapes and traditional cultures. In particular, for developing countries where a high proportion of labour force is engaged in agriculture, farming activities are

important from the viewpoint of rural development and employment and of avoiding concentration of population in urban areas.

49. Domestic production is related to these multifunctional roles of agriculture, and in examining the cost-efficiency of maintaining/increasing domestic production for food security, other contributions by the domestic agricultural activities should be properly taken into consideration.

4. DESIRABLE INTERNATIONAL FRAMEWORK TO ENSURE FOOD SECURITY

4.1. Need to address according to each country's situation

50. As stated in the previous chapter, each country has a right to pursue the optimum combination of domestic production, importation and public stockholding to ensure its food security. A desirable international framework should allow countries to pursue their respective goals based upon their specific situations.

51. In the case of developed countries, the need to maintain infrastructures for production in case of crisis, and to keep a certain level of domestic production is essential to secure food security, as well as securing stable and diversified importation of agricultural products. Public stockholding is also a necessary and important policy measure, but it is effective only as a short-term relief.

52. In the case of developing countries, in addition to the points above, an increase in people's purchasing power of food is essential, as well as an increase in domestic food production in a sustainable manner. It should also be noted that a number of food exporting developing countries are at the same time importers of basic food, and their exports are often concentrated on one or a few agricultural commodities.

4.2. Implication for the WTO agricultural negotiations

53. In the light of the various situations mentioned above, we must recognise that food security cannot be achieved through a panacea prescription applied to all the Members of WTO. In other words, food security can only be secured through an appropriate combination of WTO consistent measures, such as domestic supports, border measures, stronger disciplines for export restriction/prohibition measures and an adequate level of food aid for NFIDCs, taking into account the specific situations in various countries.

54. The WTO Negotiations on Agriculture have started this year, based on Article 20 of the Agreement on Agriculture, which all the Members have committed to. In this framework of reform process, we should seek the establishment of a set of rules that will allow all the Members with their different backgrounds to have ample flexibility to implement the most suitable combination of policy measures to attain their own goal of food security. The reform should cautiously proceed so as to enhance food security for all the countries, including ensuring sustainable domestic production, access to stable and predictable world market and diversity of resources of food imports. In this context, the reform should include, *inter alia*;

- Flexibility to allow the maintenance of a certain level of domestic production and its potential through a proper combination of appropriate domestic support measures and border measures;

- A balanced reflection of the interests among importing (especially, net food importing) countries and exporting countries.

4.3. Considerations on developing countries

55. At the same time, the problem and needs of developing countries should be duly taken into consideration in the negotiations and properly reflected in the outcome, *inter alia*;

- helping developing countries, especially LDCs, to participate in the world market and the WTO system, taking duly into account their exporting interests;
- adequate food aid for countries in need (especially NFIDCs), avoiding negative impacts on the enhancement of their domestic production; and
- sufficient assistance and capacity building to enhance domestic food production in developing countries.