

# “ World Food Security and Sustainability ”

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## Introduction :

### *Generalities*

G8 Summit dedicated to World Food Security and Food prices volatility (“ Global Food Security” May 19,2012,USA) It coincide with this year 2012 New Food Crisis. It resumed and amplified the “L’Aquila” Pledge (former G8 Meeting in Rome 2009 venue, after 2008 Food Crisis), with more investments and help for the most vulnerable countries. *Food Security* has been defined by the World Health Organization (WHO) as:”*having three facets: food availability, food access and food use*’. Food availability, as: “*having available, sufficient quantities of food on a consistent basis*”. Food access, as “*having sufficient resources, both economic and physical, to obtain appropriate foods for a nutritious diet*”. Food use, as “*the appropriate use, based on knowledge of basic nutrition and care as well as adequate water and sanitation*” completed by a fourth facet by the FAO, as “*the stability of the first three dimensions of Food Security over time* “.

Agriculture represents in many Developing countries the main economic activity. Humanities grew naturally from prehistoric times on, bearing insecurities all sorts, but been more or less able to find its way and cover basic needs in the proximate environment. Last year, our Global Population exceeded 7 Billion of inhabitants, the growth has been so fast ( it doubled in 40 years) and will reach 9 Billion by 2050 certainly, “*Feeding the World*” has become a worrying question at the turn of the century facing the finiteness and, risks of unavailability of the vital resources on our polluted planet. A quick inventory of the resources, from most common requirements to begin with water, arable lands, atmosphere, sunshine and temperature, Energy availability, that all of which are necessary for Food Production, shows they have been less than uniformly distributed on the globe and unavailability pressures are linked to crops production, inflation, environmental, energetic and trade. Over the time, the quest for supply to cover our needs has become real, the most deprived countries or communities falling into poverty, unable to protect youngest children and weakest, threatened by hunger, disease, growth disruption and overall development of these areas. In this presentation the evolution of World Needs particularly in staple foods is reviewed, as for trade exchanges and commodities price volatility, the Environment situations, commitments and scope of actions of the United Nations and

International organizations to maintain staple foods availability, are depicted. This text will try to analyze complexity of the phenomena or difficulties met to regulate food crisis, and the problematic of future evolution and possible actions to preserve Food security and deteriorating Environment in prevention erratic weather conditions.

## I) Evolutions of Food Needs and World Productions:

### 1.1 World Population Growth:

Population on Earth is growing faster since we reached 7 Billion inhabitants last year (November 2011) and may reach 9 Billion in less than 40 years. The 2 largest countries in the world are China (1,384M. people), then India (1,184M.), but according to forecast in population growth India will rank first with 1,807M. people ( or 20% or the people on the planet in 2050), before China (1,424M.). Definitely Asia ( including India) will represent highest growth (with 60% of the population, in 2050 UN Population division forecast 2007) and contribute largely to world population growth, followed by far by Sub Saharans countries, African countries and central American countries ( + 2.4% growth rate, which is still higher to World average of 1.3 % and 0.3% for OECD countries). Following India and China, two largest countries ranking, are much less important in population size in decreasing rank the: USA (420M.), Indonesia(313M.), Pakistan(295M.), Bangladesh(280M.), Ethiopia(227.8M.), Nigeria(260M.), Brazil(260M.) and Congo( 189M.). Can be noted that often fertility rate are the highest in countries having to face lower life expectancy, and occurring most often by poorest and lowest educated countries, and the opposite in figures for highest GDP with highest expectancy, highest education, lowest fertility, or are observing birth control such China or some insular countries.

FAO last year reported 925 M. people are chronically hungry due to extreme poverty, while, up to 2 B. people lack food security intermittently due to varies degree of poverty (17,000 children die of hunger each day)

The question of accessibility of foods by each Nation and availability of natural resources becomes fundamental for some countries, who can go through importation of foods when the country do not produce, or cannot be in enough proportion to feed its population. Agricultural Trade exchanges having taken the lead in World exchanges the past decades, commodities have to bear spikes of prices in 2008, 2011 and on this year again. The fear it will become a regular trend, under increased risks of Climate Change turning into new seasonal patterns of weather around the World are in the center of the problematic and sustainability of Food Security, when prices put the basic nutrition out of reach of impoverished populations.

## 1.2 World Production:

World agricultural production has gone through different revolutions and has converted habitat (forests, lands) into fertile croplands on the 5 continents during last second half twentieth century from 1961 on. Modern Agriculture managed to raise agricultural production yields through irrigation method, large inputs of fertilizers, pesticides and use of mechanical methods. The International Fertilizing Association (IFA), World bank and FAO official figures show a progression of + 78% of the crops thanks to revolutionary yields increase in particular for Staple foods, which constitute the basic nutrition (basic daily calories intake) that many of the Least developed countries (LDC's) do not have, facing serious deficit of nutrition and bear highest mortality, among weakest person, children in particular.

There are different types of staple foods, and distinct traditional diet in each region, including cereals, peas, roots etc.. The mainly known and top produced are Wheat, Rice and Maize, (constituting 50% of the calories intake of humanity / FAO 2003). A map would show that Wheat culture are largely spread in North America and Europe, Australia and North Asia, while Rice is widely cultured in South Asian countries and Maize or corn is a staple food for Central and South America but its culture is present all over the world and traditionally used for livestock feeding, and more recently particularly in the USA, large belts of GMO corn are deterred from agricultural ends to be meant for Bioenergies production (Bioethanol extraction).

Production in figures:

*-Total Cereals Production in the World: 2,208 M. T.* (including Barley, buckwheat, maize, millet, oats, rice, rye, sorghum and wheat), China leading with 431 M. T., USA 398 M.T., India 195M.T. Brazil 71M.T. France 65M.T. of which Maize, Rice and Wheat constitute 98% of total cereals produced as per following figures:

*-Maize is most abundant production among cereals with 844 M.T.:*

USA: 316M.T., China 177M.T.,Brazil 56M.T.,

*-followed by Rice, 2<sup>nd</sup> largest cereals production in the world with 672M.T.*

China 197M.T., India 120M.T.,Indonesia 66M.T., Bangladesh 49M.T.,

Vietnam 40M.T.,Myanmar 33M.T., Thailand 31M.T.

*- finally Wheat with 650M.T., 3<sup>rd</sup> largest cereal produced in the world:*

China 115M.T., India 80M.T., Russia 41M.T., USA 60M.T., France 38M.T.,

Germany 24M.T., Canada 23M.T., Australia 22M.T.

Many of the quoted countries are producing in enough quantity to cover their own needs, and constitute a safety storage of 1 and half to 3 months requirements and

ensure territorial Food Security, the rest is sold on export markets.. Commodities have peculiar stock markets allowing to sell on term markets the goods, before they are harvested, it means that from the moment they are planted in the fields, the cereals are traded. This belongs to the instruments of management and regulation against short term price fall or increase, and brings a form of capital for producers, while protecting buyers for past centuries. But on this market, speculation has grown since financials with their huge capital means, created new contracts forms, and commodities had become speculators object of investment and profit, while for example, the value of Sugar could exceed too many folds the real value of the production, and similarly for scarcer production (cocoa, coffee, vanilla, etc...), and, for staple foods, to unreached peaks between 2006, 2008, 2011 and 2012. From 2006 to July 2008 total developing country food import rose from about \$191 billion in 2006 to \$254 billion in 2007., or + 24% more expensive for these basic foods

As prices have become more volatile, according to the FAO:

*“... as of March 2008, volatility in wheat prices reached 60 percent beyond what could be explained by supply and demand factors,...”*

while the US National Grain and Feed Association (NGFA) testified to Congress:

*...“Non-commercial” commodities speculation was a factor, though not the only one, that impeded price convergence and induced extreme market volatility”*

Agricultural Commodities index (according to US Senate Testimony march 2008):

” Future Contracts” prices Increases in percent (for period: March 2003 to March 2008) have been at peak: Corn + 134%, Soya bean: + 143%, Wheat + 314%

2008 food crisis and price volatility shows that the commodities prices sold were so far higher than the real demand and needs in volume, constituting one major factor in staple foods volatility and increase of Food Insecurity>

An overview shows that major countries can manage to cover their staple foods except developing countries that will have to keep on relying on imports of cereals to maintain their Food Security, estimations of needs raised by 300M.T. by 2050 due their population growth, speculative impacts and uncertainties of climate. The requirements when conducted under normal weather conditions trade concerns a fringe of about 10% of World cereals production (9 to 13% in variation) that bear high pressures on prices due uncertainties of harvesting in each country, food demands and financial consequences. In terms of volume of production, Wheat, Maize and Rice productions are in progress and progressive liberalization of trade helping to meet the gap for deficit production countries while net Exporting countries productions can in normal harvest conditions help to provide basic foods to deficit producing countries for their current needs and stock constitution (which might be for the USA with 119

M.T., the EU : 29 M.T., Eastern Europe countries: 30M.T., Australia: 30 M.T., South Asian countries : 100M.T., estimation for 2020, Impact model/ IFPRI)

### 1.3 Commodities, Trade exchange and Price volatility:

Reviewing some facts and figures around the World, in concern of agricultural productions, needs and trade figures, it describes EU as a main player with Intra Trade that stands for 30% of World agricultural trade, while imports from developing countries of cereals wheat have kept on increasing since 1990 on, and while Asian countries showed as net importer, OECD countries could supply as net exporter (FAO Stat)

#### ***a) Analysis of factors playing on Commodities price volatility:***

According to the International Food Policy Research Institute (IFPRI) analysis, the food price increase are correlated to 3 main reasons or risks: Biofuels Production, Commodities Trade, Climate Change,

Hereafter, a few more factors that may influence staple foods price volatility:

- *Natural factors:* Tillable lands surface is submitted to pressures from fast expansion of Urban, Transportation, Industrial or Touristic developments that can be temperate by converting forests or wetlands into croplands use (which occurs at the expense of the Environment fatefully and irreversibly modified, destroying preexisting ecosystems and equilibrium) and laminating potential arable land surface
- *Surface or ground Water resource* provides irrigation water (irrigation is using about 70% of total resource) but ground water is also pumped for our industrial and urban use. Thus way ground water do not have enough time to reconstitute through ecosystem services and is seriously depleting. In a way to highlight this phenomenon, the coming 2013 year, has been declared by UN, International year of Water Cooperation for UNESCO (2012 the year of the Sustainable Energy) to keep on attention on this fundamental resource, and intense scarcity in African areas with 2.8 Billion people under water stress along the year.
- *Climate Changes* caused by human activities as underlined by UNFCCC, on each year the Conference find evidences on last decades of adverse situation in southern hemisphere (African countries again) or observe growing frequency of weather shocks (modifying the isotherms maps and seasonal patterns enhanced by natural catastrophes such as Hurricane, Typhoons, Ice caps and glacier melting, droughts and floods, some are linked to human activities/GHG emissions from Fossil fuels main and cheapest energy resource and Temperature oscillations on Southern tropical Pacific ocean: periodic “El Nino” (ENSO) each period can be less than a decade (last one happened from May 2009 to April 2010). It alternate

with its opposite Temperature swing or oscillations “La Nina” causing periodic climate change since 2010 and through beginning 2012, wettest year (deluge floods in Australia and Africa, monsoon in India), serial of tornados in the Midwestern and Southwestern United States, but also droughts and dryness on Pacific Ocean currents, impacting Global climate with high temperature in Eastern Indian ocean and coldest winter records of the century in 2011.

- *Production and Populations showing irregular distribution and demands or foods.* In deficit areas the seriousness of the situation is threatening the health and natural growth of the population , affecting the children, feeding women, weak and ill populations in least developed countries missing also water and health care worsen by Food crisis. The seriousness of more and more expensive staple foods have recently pushed North African countries to riots or Spring revolution, civil war in Sri Lanka, as well in 2008 riots and protests during the last food crisis have burst out by most affected populations. While in the opposite, high income societies wherever their distribution in the World have increased the intake of calories with 1 Billion overweight persons and 300 Million obese ( which includes overweight in poverty due to cheaper cost of higher calories food).
- *Price formation :* Staple foods crops volume and unpredictability of yields before harvest, so do the needs or stock constitution, they cannot be determined before end of harvest, meanwhile are submitted to weather change and term market speculations, as well as variability of retail or wholesale prices, subsidies and demands. Some countries government under temporary or permanent shortage, use to impose export restrictions to guaranty their domestic requirements, this is the case for one fourth of the countries in the world (in example: the bans on maize in Malawi and Uganda, when they were in deficit harvest, and ban on rice also happened in India and Vietnam).

- *Inflation for foods, energy resources, pesticides, fertilizers, seeds ...*

Another point is that modern agriculture has brought mechanization and the overspread usage of pesticides associated to chemical fertilizers, and improved seeds which shows extreme industrial input concentration half of the World inputs market (covered by only 3 large Producers groups) binding the crops to fossil fuels price fluctuation on one hand, (carbon foot for production and transportation of the inputs to farms raised) constituting highest input cost during 2006-2008 periods in correlation with price raise. But exception was made in 2011, the fertilizers price went down surprisingly to 10% less although, oil price had raised 3% (Under health consideration some pesticides went through International agreements to limit or phase out the most dangerous types at Montreal protocol

for example, was phased out the widely used “methyl bromide” in 2005, or allowing some timeline exceptions). On a second hand the volatility of staple food prices find out more and more in correlation links with sensitive energy markets prices, such as the fossil fuel (oil barrel price varied between US\$60 to 150 the past few years, while pesticides, fertilizers are fossil fuels by-products) the other energy market is bioenergies produced from crops or known as the first generation of biofuels, called energy crop or fuel crop: extraction and purification of bioethanol is made from corn starch and sugars, in the USA mainly, first bioethanol and first biodiesel producer in the World . Although this market is still limited and required government subventions, the demands have been growing and the fields cultivated with Genetically Modified Corn (GMO), ensuring larger yield with less inputs costs due the characteristics of the GMO crops and minimize losses.

#### **b) Problematic**

- *for regions with persisting food insecurity:*

A map could show the impacted population coinciding with poorest economically speaking regions, with small holders, low value production and stressed by poverty and illness in unprepared rural areas. The lack of infrastructure, finance, education is the main reasons for persistence, generally the staple foods production being the only or scarce economic activity and resource of some of the suffering countries.

- *for population growth*

Fast growing population in some countries combined to resources depletion, raise of food insecurity, and lower conditions of life occurring, are most worrying problem, when facing weather uncertainties and possible massive migrations risks. Also the demand from rapidly growing countries consumers gain with their income raise, often thus way statistics shows the ratio to purchase foods in total expenditures decrease with level of life gain.

- *for environmental, energetic and economical considerations:*

The present scheme is not sustainable and could be improved in energy efficiency, with optimization of the consumption with less waste in biomass and water to allow larger biodiversity choices around the World and replace some of the cereals demand, and back for example to some traditional patterns or improved diets from indigenous species, which would have many benefit returns of course for the environment. It would also help to depressurize the food market prices previsions

By allowing more researchers to contribute in regional projects and reevaluate the energy efficiency and energy market and its linkage to agricultural stock markets As well as inter effects of price and volume on derivatives of future contracts during production season.

- *for the depletion of resources on Earth:*

Fresh water is a very limited resource on Earth, (97% of water is saline and in the Ocean seas), among these 3%, 69% are temporarily blocked in North and South pole Icecaps and glaciers. Then 31% is under the ground (groundwater) often contaminated by industrial, agricultural; and rural polluting agents, Finally only 0.3 % or almost 10 M. cubic meter fresh water are in our rivers, lakes, swamps and clouds. In a way to avoid battles for water, 145 countries had signed 300 agreements to ensure their borders or fairer share use of rivers, lakes in common But it still lead 30 countries to water war, and construction of dams or diverting systems on rivers is seriously threatening river banks population . The demands in the future for water will increase one or two folds by 2025 according to UK Food security report,. In Africa, currently 2.8 B. people living in permanent water stress, which might worsen again by 2030 and involve 3.9 Billion people. These figures reveal the emergency of the situation, estimation of waste of water is common in cities and for economic activities (Irrigation, industrial usage, or urban use, pumping from groundwater) and not all administrative care to manage or control water resource, while some administration can manage to cut half of the needs if their consumption well regulated and the users better informed. (Moving toward more ecological systems, rain water harvesting, water plants with kitchen waste water, etc...)

What are the other resources necessary for staple foods culture? It begins with tillable lands, which surface is not constant; it is submitted to surface erosion, or other purpose usage for industries, transportation or urban expansion. Generally developing countries will extend the surface thanks to forest or other lands such as wetlands, and affect the former ecosystem equilibrium and consecutively assist to habitats conversion, CO2 emission (CO2 will escape from the soil when trees roots are cleared off), and may intensify and worsen past situations.

There is also the fact that half of the cereals produced are used to feed livestock's, which again adds to the pressure on developing countries food security deterring enormous quantity of water to cattle farms. When cereals production cannot meet with the needs or, when prices raise to unaffordable level hierarchic demand for water to produce meat or dairy suggest a deep reflection on our intake and resume with hunger and staple food supply..



- *for the use of crops and produce first generation of Biofuels* in some countries.: These energetic targets have been fixed by main developed countries having to face fossil fuels and nuclear resources depleting in a few decades time; in less than a century. At the same time total food crops are threatens to shrink with plausible climate change risks or new climate patterns and water distribution. The abundance of the Biomass on Earth and free solar energy appears then, as possible solutions for sustainable productions of Foods and energy. Therefore large investments have been made all over the world in Research program to tackle to the bottle necks met to produce advanced generations of biofuels jet fuels, bioethanol, . . . , that could use the sugar from the cellulose of non crop cultures (not arable lands occupying plants, or not land occupying cultures such as fast reproducing algae that would present many advantages, among which of importance, of not requiring fresh water been able to use seawater or waste water) and deliver at the same time more nutrients and edible foods in replacement less reliable terrestrial crops.

*-for global trade and agricultural products in Doha Round (WTO)*

Agricultural products has been introduced in the Uruguay Round (GATT-WTO in 1986) during the long negotiations the target to convince or impose freer trade to producing governments (many net exporters in developed countries) and stop distorting World Trade with export subsidies or support or tax imposition in lower economy income countries. In this case the main staple foods and bioenergies falling under international trade rules cannot be concluded or enforced marked by non transparency of costs and prices.

A study on export restrictions and the impact on stock market prices, have emphasized the difficulties that cannot be discussed by Doha round (Brahmhatt and Christiensen, 2008)

These situations briefly described hopefully will help to better understand past and present Food crisis in the research of higher Food Security and Sustainability. .

## II) Environment evolution and Resources availability:

The production of staple foods to feed all inhabitants on Earth as seen could be covered by each country nearly auto sufficient, but still about 10% cannot be covered and is realized though export of net surplus producing countries to deficient countries, or through support or UN programmes. Arable lands are very small a proportion of emerging land on Earth (the average figure is 13.5%, for example it is 25% for the USA) but the agricultural activities ( fertilization with chemicals been well and deep

ploughing, without fallow period, arable land is degrading and shrinking losing each year an important share of the total land. contradictory to population growth).

## 2.1 Ecosystems balance and Intensive Agricultural productions

Through past decades agricultural production, have been metamorphosed by economy scale and high yield oriented productions, minimizing the dependency on external importations, control of inputs, with the help of new sciences and techniques, in exchange of more comfort to the producers with mechanization and automation. The success retained for the farmers with several fold harvest or livestock helped to see the modernization of agriculture as a green revolution, and spread all over the world with higher technologies again. It was before the turn of the century, that environment show important modifications accompanied by a more performing but uniform international production ( only 14 species represent 90% of world productions) , at the expend of past regional less productive species, vanishing characters and the destruction of habitats ( insects, birds, rodents and pests threatened) from the fields and near fences, (as per European Birds Census Council and Pan European Common Birds Monitoring Scheme, Eastern Europe forests species can be reintroduced in Western European forests, but not 2 decades after they integrated the EU, forced to see the loss of species in their forest. This does contribute to ecosystems simplifications and loss of Biodiversity and diminish the services of ecosystems Intensive agriculture and profusion of use of chemicals to control disease and fertilizers and mechanization, helped to released farmers with less physical tasks and bring more comfort with higher yields but deeper ploughing and due the limited arable lands surface intensive production stop to respect alternating fallow and reconstituting the depletion of the soil by “pouring” increasing fertilizers inputs. USA experienced in the Great Plains, large areas eroded, also called “Dust Bowl” when winds swept the destructured soil till scratch, droughts after drought. Similar situation is observed in SubSaharian African countries ( 38 including Kenya from 1981 on (Stoorvogel et al, 1993 and UNEP, 2004) losing severely their nutrients. While the .most impacted regions remains in Africa (den Biggelaar et al, 2006) but also Central Asia and Andes in mountain areas, also do the dry or steppes areas that in the opposite, are extensive grassland bearing overgrazing and no external input. The increase of production has also higher requirements in irrigation. In some regions such as land losses (951 ha irrigated lands are affected by high salinity). Livestock water resource is used in very large quantity for cleaning or in lighter proportion for the thirst of cattle’s breeding. Chapagain & Hoekstran, 2008; figured out that a virtual water demand equaling 16 000 hectoliters of water are required to produce one kg of beef meat, the pollution by livestock waste water is very important to ground

water, and their medicated diet ( growth hormones, antibiotics, insecticides,...), as well as for the atmosphere, the digestion of the livestock follow gases (methane) that constitute a main factor in Green House Gas(GHG) emissions in the air, compared to the industrial or transportation emissions.

OECD – FAO Agriculture outlook estimates 25% of Agricultural lands are already highly degraded and need to encourage better practices and regulatory environment We will be facing in the coming decades, future agricultural challenges and growing uncertainty, such as climatic adversity and consistency, and will have to find ways to reduce deterioration, degradation by erosion, overgrazing (the soil formation requiring several generations time), decontamination of groundwater and reduce GHG emissions and extend our soil and water resources in a sustainable way.

## 2.2 Climate Change and Impacts on Environment Variations

The increase of temperature during summer season in particular is compelling glaciers melting; the surface and volume size are shrinking and can be noticed around the world with disruptive river floods. North and South Poles icecaps, it differs on the year, but compared by similar season, surface that did come back few years ago, is melting again, allow vessels crossing North pole and often reported as no more able to maintain same habitat for polar bear, seals private hunting areas (images pictures are currently showed as evidence of elevation in temperatures and sea level related to human activities, threatening consecutively coastal cities and lands in global warming theory).

Water scarcity is giving pressure to water consumers: 1.8 Billions persons ( WHO, 2007) ; Agriculture using by itself 70% or perhaps more of the total water resource, of which may be 40% are used for irrigation (estimation Hannasaki et al, 2008), sharing the water resource with Industries, urban regions, destroying in some areas the buffer role of wetland, watershed or ground water, the ecosystems equilibrium seems to be definitively modified.

The climate patterns have changed in many of the regions all over the World and the migrations of species, a first protective reaction to the modification of the habitat, or the extinction of insects, frogs, bees, or mammals of larger size, testify of modifications. These changes are normal and can be found from the past, the only difference is the scale of time and space is so acute and rapid, that from a season to another and is intensifying the impact of human activities and exceeding what we can could imagine or control/ regulate on the spot and to resort to Science progress.

## III) Paths toward Sustainability and Food Security:

OECD and FAO Outlook ( 2012-2021) assessing that the “Agricultural production

has to increase 60% over the next coming 40 years to meet with food demands and manage to reduce Global Food insecurity. By the same time Agriculture will need additional productions to supply feedstock and biofuels, all these in a sustainable manner. Due the lead time to see these new productions started, the outlook optimistically suggesting of putting in practice these new methods directly by the farms in a way to reach these targets. This becomes an emergency, for example this year 2012, is again a food crisis year emphasizing the situation at present and importance of getting prepared to possibility to fall into worsen situation.

### 3.1) Actions and measures against replacement of traditional staple food: by imported foods:

We are assisting to the homogenization of the foods demand through Globalization process and Soft power impacts around the world. This has become more evident and clear in fast developing economies that have adopted many foreign foods or cuisine style in their daily intake, but is also influencing radically less developed countries in their consumption habits. The consequences are serious, as the privileged foods; have to be transported by air, sea, and road to far distanced regions, increasing the Carbon footprint of these goods, at the place of using locally available and seasonal foods, less fashionable or attractive as imported foods and will be preferred or expected. The second setback is these phenomena can only bear higher risks of price volatility on imported foods; moreover the risk is enhanced by last decade's higher frequency of weather adversity. The fact that these staple foods will be required all over the world at the same harvesting season and probably too, produced in limited quantity or specific areas. As an example the food diet has been changing in Asia, partial replacement of rice by wheat has operated, occurring a surproduction of rice, or paddy fields in fallow, while paradoxally, demands of wheat not cultivated locally and bearing fluctuation and speculation on supply volumes during past years in producing countries has been increasing . Similarly western way to eat beef meat has grown in Asian countries, as well as dairy products, counting prominent consumers (baby and children milk powders and cheeses and pastry products); the figures showing food imports did grow from 1.7 Billion (1961-62) to 24 Billion (1997-99) net import (Pingal, 2004). In a liberated market exchange principles actions taken by each importing or exporting country may be criticized, and would have difficulty to go against soft power breaking and overwhelming trends.

#### **a) New resource Foods research from non freshwater and Sea ocean water**

New techniques are announcing revolutionary resources, sustainable and abundant, that are produced by algae, and could be extracted if conditions of culture well

controlled. Micro and Macro algae offering many favorable and sustainable ability, able to capture carbon (CO<sub>2</sub>) by photosynthesis and reduce Greenhouse Gas (GHG) during past Billion years and produce sugars without cellulose structure. This characteristic makes them quite interesting for scientists, as the sugars can be directly used for feeding, and facilitates their conversion into biofuels (directly into biodiesel by microalgae or into bioethanol through fermentation process, associated to high value products, such as nutraceutical by-products. Some species as an example “Spirulina” are well known for their high protein content. They are cultivated and exported by many countries and experienced in this sense for food purpose. The other potential of algae is that they do not require as large surface as croplands, and offers fast reproduction cycle around the year independently to weather conditions under control to maintain stability of production characteristics. This benefits does put them today ahead of any land culture, and under developing stage, and if the technical bottle necks for current cultures and if the risks assessment well tested, it might could help to stop in part, speculations and volatility of staple foods prices and dilute the reliance of cereals for foods or for energy supply in the future. In the meantime some countries are very successful with their techniques (South Africa, USA and Asian countries, including Taiwan, which is traditionally a major player the production and exportation of nutraceutical)

**b) Actions to regulate distorted usage of lands and staple foods price volatility**

Safety nets have proven useful, and can help on rapid actions on the spot against food insecurity and avoid hunger and disease. They can also be projected for longer term development projects and help to install well or stabilize water availability structure and informative system for small holder on prices and technical knowledge to protect forest land and soil. The type of actions and budget to associate to these safety nets needs to be carefully analyzed before and, during the mandate and, be adapted to most vulnerable localities.

Oxfam international has advised Governments, the World Bank and the FAO to study speculation as a factor in the food price crisis to investigate commodities price volatility during the food crisis from 2006 to 2008, and speculative derivative contracts impact on heighten prices by Boards of Trade. AAI called on UN member governments to stabilize commodity prices and manage supply, which World Bank has in co-articulation with UN High-Level Task Force (HLTF) on the Global Food Security Crisis. By there, UN Conference on Trade and Development (UNCTAD) notified the opposition of some UNCTAD member states to manage price instability of commodities agreements, and advise usage of stricter regulatory measures against speculations margins and actors rights on commodity markets “to contain prices of

staple foods at reasonable limits to help affected developing countries. The term market and the normal intervention of agents before harvest has to play its positive role, by investing in crops that are not yet ready to sell, do favorites the dynamism of markets and risks in whole profession, and be able to express the unpredictability of climate change or scarcity of the goods but should not emphasize it or impede poorest to access to basic foods at moderate price offers, and not waste fund budgets on overstate prices.

EU has created a Food Facility support instrument in 2009 with a budget of 1B.euro for a period of 3 years, to help 50 priority developing countries and, ward off, soaring prices, proposing rapid, direct aid to vulnerable people, and to encourage farmer with microcredit during the production season to raise his production capacities (equipment, infrastructure) and overall management.(vocational training), Most funds are channeled through HLTF for dialogue and assistance in place. (UNRWA, FAO, UNICEF, WFP, World Bank, IFAD, UNDP and UNOPS,) and through national budget of the beneficiary countries

Concerning speculative actions, financial places in the UK has raised the detention of contracts in dominant proportion in 1993 “Future and Option markets and derivative markets” account for 15%, while during 2008 crisis, speculators account for 60% of them. According to the World Development Movement (WDM), speculation contributed to boom commodities inflation: the total assets of financial speculators in these markets nearly doubled, from \$65B.in 2006 to \$126B.in 2011. Commodities exchanges profit is function of the numbers of trades made, as a strong incentive to promote greater volumes of these sorts of speculative activities, Further, derivatives market is traded through unregulated bilateral deals between private banks and funds allowing more liberty on price deal, while “future and options contracts” are traded on regulated margins exchanges. Finally the WDM denouncing the “Future and Options markets “ not responding to supply and demands rules; they can be represented the month after in a way just to keep contracts running and positions during term time, and not reflecting markets situation. All these give evidence on related effects of important speculative investments to commodities price volatility, and call for actions from financial places and governments to control contracts holders in their transactions.

**c) Actions to deter Intensive productions of non indigenous variety, hybrid or GMO crops bioenergies.**

Hybridization has been largely spread in Agriculture pushed by Industries, and governments, in the aim to produce higher yield strains, resistant to diseases and weather harshness. This certainly helping to feed and save many of the people

impoverished; FAO, UN organization statistics show the benefit for the low crop countries stressed by hunger to see larger crops since them using the hybrids seeds. Then it has to be said that wherever the hybrids introduced, (local less performing indigenous genotypes has been neglected to extinction point), or threatening local species biodiversity and Ecosystem Services erosion.

None of the less, large surface of cultures were emblaved with Genetically Modified engineering techniques; species such as Maize, Soya bean, Rape seeds, but also vegetables, roots and fruits. Small holders found more profitability as it can reduce the inputs costs before harvest, and minimize the losses during transportation, storage, distribution and meet optimal high yield. Nevertheless some countries like France and Germany last spring have put ban against GMO maize (the MON810) culture in their territories, in spite of European Food Safety Authority (EFSA) disapproval against these 2 Member States contesting through Emergency Measures (EM) scientific tests submitted to the EFSA. The introduction of GMO's entail a level of risks missing laboratories evidence, despite some countries reported the transgenic dangers on microorganisms, virus, bees, wild species, human health They consider GMO in general are a threat to the whole environment, toxicity and change genotypes and ecosystem services at end of cycle, as present tests conducted are not offering a vision of what may happened in the future. The advantage of the GMO products are very interesting; for example a GMO-tomato will keep a fresh and nice red look longer even it is meeting its senescence phase might be rotting, resisting to insects and transportation shocks, (Regardless of this, genetic engineering may be using without distinction in crops, either animal or vegetal genes, which occurring on transgenic animal GMO tomato, should be a vegetable fruit apparently and may be consumed without labeling by a vegetarian). GMO fields are representing today about 10% of total arable culture in the World and keeps growing; Large industries in the US supplying GMO seeds have been for long refuted by EU countries restricting their borders access to GM crops even for livestock use, till WTO Dispute Settlement Body decision; in respect of free trade and no harming evidence, to open access EU borders to GMO products. EU for prevention measures reinforced the labeling legislation in particular for food products compulsory information of content for consumer, then since, GMO culture since are cultivated by several EU member states.

In a way to find real environmental some recent inventions are boosted by international organizations for increasing Food Security, meaning to be benefic for Humanity and fight against hunger, we mention the prevailing influence.

- A new hybrid crop, appears to be a very viable solution to increase rice production in an environmental and high yield way :This is the “Green Super Rice” a new high performing hybrid, without GM techniques, developed by Dr Z.K. Li and his team with the Chinese Academy of Agriculture and Sciences and the International Rice Research Institute ( Philippines) and is the result of more than 250 rice varieties and hybrids characteristics and resistance to pests diseases. It may provide higher yields and offer tolerance to difficult growing conditions or environment, such as drought, high temperatures, high salinity or alkalinity, floods or low inputs, not requiring pesticide and more environmentally friendly crop. The new seed has been already adopted and will be spread out in Asia and Africa, and may help to feed additional 100 Million people as per reports. By 2035, 170 Million tons can be produced; Africa will be able to become auto sufficient in its rice production and supply, overall it has enriched qualities with high content of vitamin A, iron and zinc complements. A worrying problem may grow with this agro-management, it is the rapid expansion of this hybrid rice; past productions price costs may be competed and entangling traditional paddy holders, global paddy cultures may tend to the uniformity of varieties and species in many large regions in less than a season and evolutes toward a new kind of threat, the direct one is on indigenous plants, biodiversity and ecosystems balance, economic threats on market offers and risks management difficulties to cope such a development in shortest term toward a global situation for environment and developed hybrids or GMO strains.
- Another invention may bring immediate returns for water resource depletion. It consider to help irrigation and culture by coastal desert areas, using salted seawater, thanks to “Vast seawater Greenhouses ” technique; this original process, invented by Dr Ch. Paton (UK) is using seawater to cool down greenhouses in the desert and humidify the plants inside, through complex condensation tubes systems; and can manage to collect enough condensed freshwater for watering the greenhouse plants, and further to that, can produce 5 times extra water that can be collected, and irrigate the environment to grow other plants locally. This is also a revolutionary invention, as per the past, lots of research were trying to evaporate seawater and had in their way to release the water of its salt content, to sue equivalent energy or much more energy and shows inefficient. The successful results could help to develop a Greenhouse pilot project and successfully contracted to green a desert in Jordan and build a “Sahara Forest project“- the seawater will be combined to the development of technologies for food production and Biofuel crops in this same project.  
This invention can perform many projects and another huge project plan to create



thanks to seawater a linear band of forest of 15km wide, 7775 km (East –West) long that will stretch from Senegal to Djibouti through 11 countries and form a “Great Green Wall of Africa” to stop the Sahara desert southward expansion and create an oasis for tropical fruits and vegetables production

Certainly many more projects and invention are on their way, and will be able to help to solve the freshwater, food and energy resource depletion and provide sufficient staple foods to feed the World and stop poorest country from hunger or disease in absence of water, clean environment and basic foods.

Present economic system have not been able to stop past situations or periodic crisis occurrence, by adopting intensive agricultural methods and resorting on subsidies that are distorting production, trade and impacting natural environment, the system seems missing regulating or sensitive control system that could avoid humanity to verse into irreversible patterns such as loss of biodiversity, Ecosystem Services, extremes like abundance and waste against starvation, International Groups financial interests, Food insecurity and large scale starvation and migrations.

**c) subsidies in fossil fuels replacement impacts and decouple subsidies to productivity subsidies for sustainable energies support**

Disruption on fossils fuels subsidies had been often debated and still in practice in most countries including USA who is importing but also producing. The past decade more subsidies have been dedicated to alternative energies, that can be defined into clean energy, replacement or sustainable energies. Due the tense competition with fossils fuels, many of the ecofriendly energies are yet far to be viable and rely on government funds to push the researches and offer alternative solutions to depleting fossil fuels and aimed to cover growing energy needs for transport or go greener for houses needs for energy for cold and heat maintenance, light, water, waste

**d) Action to spread Healthier diet trends and consumption habits;**

Individual and group consciousness and promote smaller carbon foot print choices. As said earlier 50% of the cereals and staple foods go to livestock to produce meat. Nowadays more and more people are acknowledged of the advantage to eat vegetarian, or less meat food (humans would need only 20 to 25 gm of animal protein per day) spiritual influence, religious restriction, do succeed in diet recommendations. Even we would have alternative choice; consumption habits and propensity are not easily modified. Some facts and figures can be depicted and help to convince, alert or remind to the consciousness of consumers and diminish reasonably the meat demand and cattle raising supply in a way to

liberate more foods for humans healthier life, as many diseases come with overweight or unbalanced, too rich diets, following cardiac, coronaries, liver, etc. illness. The figures also shows that the meat consumption increased in developing countries or faster economic developing countries, and goes up with income raising, also the form of distributions is different in rural or urban area, the trend shows that Cities are very much more attractive than rural areas, and can concentrate from 60 to above 70 % of population; higher pay and consumption in cities creating fuzzy activities,, invited by more convenience or appeal to buy or consume at the corner of the street, associated to large choice of restaurants, quality meats and recipes in quite high calories and high proteins menus, close to working or leisure areas has favored social purposes in much more proportion than in rural areas.

### 3.2) Forecast of Food Needs and prevention measures:

#### **a) Establish Maps of isotherm since periodic changes (El Nino, La Nina)**

IPCCC issued much information, some maps helps to view rainfall distribution, temperature regime and carbon emissions partition in the case of extreme weather, (floods, storms, drought, hurricane, typhoon) production losses and price escalation. These maps can help to follow the changes with past season patterns and regulate the terms market , for stocks level, harvests and modulate the trade movements consequently. As seen between 9 to 13% required to be traded on international market between producer from their new harvest and cereals stocks inventories and importing countries needs. For the time been, EU has through its European Environmental Agency, established maps and climate change impacts , as did the US through their Global Change Research Program to follow impact and new delimitation of regions World Biome and their stability in future schemes.

#### **b) Constitution of rescue system and regulating productions system combined to actions against price speculations**

Toward a Food security strategy and rescue system

The Public investment playing a catalytic role, government has to rely on larger private investments involved in the agribusiness ready to cope with Food programs .The existence of safety nets might helped to save vulnerable people more at the moment, with short term financial. But since 2002, during 2007-2008, 2011 Feb and this years, serious rising prices of cereals commodities have brought organization to protest against price bubbles for staple foods. The secretariat of UN conference on Trade and Developments (UNCTAD) in his publication of “Price formation in

financialized commodities markets - The role of Information”( 2011) helping to clarify that most of the participants needs more information for their decision making, but missing accuracy of information ( inventories, quality of data, timeline evidences), also that the financial investors, such as large banks, industrial groups acting on different financial market, such as oil energy market that comes in correlation due the biofuels production and lack of accurate may bring “ herd” decision. Since they have classified the commodities as an asset class, Barclays bank PLC or agricultural commodities derivatives, Goldman and Sachs,etc..., contributed to distort the price in magnitude, duration and breadth, using financial markets strategies, such as disinvesting at highest prices to harvest profits while not focused on the interest of producers or consumers. In these conditions, the report from UNCTAD clearly enounced ways to improve the situation, such as let commodities distinct from the Financial markets and back to the Goods market. Tighter regulation of financial players also recommended by UNCTAD Secretariat on main international places and the introduction of a transaction tax system would gain in slowing down the large invests and activities by financial investors in commodity markets these through US Commodities Future Trade Commission, EU regulation initiatives for example. These has been sustained by organizations such Oxfam, World Developing Movement (WDM), acting against market distortion and poorest interests, working against difficulties of shortest term and to see these measures to be implemented. In this sense international association care for local or specific cereals in the past : hereafter some are listed :

- World Food Program (WFP) proposing a Global Response to High Food prices and immediate needs of vulnerable population(food assistance, development of safety nets and change in trade and tax policy which goes deeper with social protection measures, support for smaller farmer and regulating the role of speculative investments in international markets

- UN Relief and Work agency for Palestinians ( UNRWA)

- Asia : for Rice

- OECD for Cereals. Corn and Soya

- Africa for Roots, ...IBARA ( African union)

Rwanda : 2001 + IDA worked to achieve FS and Agricultural Productivity

Burundi, Gambia, Kyrgyz Republic, Malawi, Senegal, Tanzania (May 2012)

- Also IFC, IFAD, UNDP, UNOPS,

In particular as seen before EU has launched since food crisis unacceptable level a Food Facility budget on 3 years was 1B.Euro (2009-2012 EU Rapid response to food prices in developing countries) is made on partnership

**c) Association of all organizations in common actions for Food security on Earth to ensure World Peace and Wealth expansion.**

( see in annex : United nations Food issue and tasks, actions, funds and organization involved during 2008 food crisis)

We listing hereafter the major acting organizations with some fields of action.

OECD/ DAC

FAO and initiative on soaring food prices, Hunger Portal (World summit 2009-2014)

APEC

CFS round table monitoring Food security

Alliance against Hunger and Malnutrition, The right to Food

GAFSP, supervising entities

Economic community of West African States (60 M' euro) signed with EU – Food Facility contributing agreements (May 2009)

UN High level Task force (HLTF) ensuring Policy, dialogue and assistance with UNRWA, UNICEF, WFP

and, many NGO's association around the World have been involving in sustained way by the past to reduce unacceptable situations for the most vulnerable people.

## Conclusion

As we tried to show in this paper is the multiple factors that constitute the food production and staple foods security conditions. Among many of the factors out of our control, such as adverse weather, depletion of resources, the speculative derivatives contracts that could have amplified the demand capacities or the bad news on harvest, exhausting World bank and International Organizations funds and aids to buy staple foods and deliver to countries population under food stress might be better supervised. Closer control of speculative rules and artificial price volatility can be benefited to more people in the need, and have staple foods commodities out of general commodities denaturing price race, and manage to control harvest figures and inventories on time line, to carry the Goods market with more reasonable price and avoid selling price bubble and no more related with intrinsic value of the traded product.

It is encouraging to see the progress of new technologies third generation bioenergies research, helping at the same time to get access to large sources of sugars, foods, nutrients, protein and energy as well, independently to land crops constraints (soil, water, weather, time), and allowing to really modulate the finished resources submitted to temperature or energy market oscillations.

The paths toward sustainability will have to go through multiple actions at

different level, Government, World Organizations and NGO's or individuals, as well as giving more transparency in the food chain in between producers, and consumers for staple foods, that should be retrieved from financial markets with distinctive taxes on profits to make the gain not worth for the banking investments.

Predictability and accuracy of information, as well as progress in new scheme of productions or use of sustainable resource on Earth could help to lead to a more balanced, sustained food supply with healthier and more nutritive diets for all , and provide in priority for vital life in countries requiring assistance ( 6 M. children dying every year of hunger impact, an additional 400 000 children may dye due the 2011 prices spikes, figures not yet available for 2012 's) and let average production per capita meet the needs.

The combined efforts of governments and researchers may bring to find solutions to the problematic and complexity linked to the staple foods supply and new models of production, recycling wastes and gain in accuracy and adaptation in respect environmental rules for sustainable productions, and helping the less developed areas through partnerships actions or specific projects optimize their productions and strengthen each region to reach higher food security level ability and minimize risks and critical situations. The association to international program of industries or private funds seems started, but will need more assessment to evaluate the impacts and ways to better control each program progress and target on time line.

## Annex

<http://www.un.org/en/globalissues/food/>

*Extracted from UN website, food issue, about Tasks, actions, funds and organizations involved:*

“According to the Task Force, these high prices are bound to impact on the world’s ability to achieve the [Millennium Development Goals](#). This applies in particular to those goals which set benchmarks for the reduction of poverty and hunger, child mortality, maternal health and basic education.

Its Comprehensive Framework lays out actions to meet the immediate needs of vulnerable populations. These include food assistance, nutrition interventions, development of safety nets, and changes in trade and tax policy. Other actions aim to build longer-term resilience into the global food and nutrition system. These include social protection measures, support for the local small farmer, and regulating the role of speculative investments in international food markets.

Among the members of the UN system most active in addressing this crisis along with the actions they are taking are the following:

The World Food Programme (WFP), through its [Global Response to High Food Prices](#), is enhancing the availability of nutritious food products for young children, mothers and other particularly vulnerable groups. It is also including new and improved commodities in its food rations and promoting local production and the purchase of nutritious food and food products.

The World Bank Group's [New Deal on Global Food Policy](#) addresses the short, medium and long term, through such safety nets such as school feeding, food for work and conditional cash transfers. It promotes increased agricultural production, understanding of the impact of biofuels, and a reduction in distorting trade subsidies and barriers. Its new, \$1.2 billion rapid financing facility, the Global Food Response Program, speeds assistance to the neediest countries.

The Food and Agriculture Organization of the UN (FAO) directed nearly \$US 59 million in 2008 to assist the most severely affected countries during the planting seasons. FAO’s [Initiative on Soaring Food Prices](#) involves providing policy analysis and assistance, and increased access to seed, fertilizer and tools. It fosters

infrastructure rehabilitation, including through irrigation. It also deals with improving production, agricultural markets, reducing crop losses, disaster risk management, coordination support and technical assistance.

The International Fund for Agricultural Development ([IFAD](#)) had made available up to \$200 million, as a first step, to boost to agricultural production in affected countries. The money supports increased production by smallholder, family farmers. It helps provide credit to purchase agricultural inputs, for seed distribution, and for seed multiplication by farmers' organizations. IFAD provides assistance to help farmers increase staple food production, including basic grains and dairy products. It helps improve land fertility and sustainable land and water management.

The International Monetary Fund (IMF) has conducted a [comprehensive study](#) of the macroeconomic consequences of the food and fuel crisis. Its country teams offer policy advice based on country-specific diagnoses, on such issues as monetary policy, exchange rates and trade policies. The IMF offers countries assistance in the design and implementation of such policy responses as tax and tariff changes or transfer programs. The aim is to mitigate the impact on the poor of high food and fuel prices. It is also providing financial assistance to a number of low-income countries through its [Poverty Reduction and Growth Facility](#).

The World Health Organization (WHO) undertakes activities focused on the myriad [health and nutrition challenges](#) caused by the global food crisis in the short, medium and long term. It helps countries assess their health and nutritional situation, and monitors the most vulnerable. It promotes food hygiene and helps ensure a safe food supply. It seeks to manage moderate and severe malnutrition, promote breastfeeding, improve access to micronutrient supplements, and implements school feeding. It promotes mother-child nutrition programmes and provides free or low-cost health services to severely affected groups. And it seeks to ensure the continuity of health-care and immunization programmes for children and pregnant women.

The United Nations Development Programme ([UNDP](#)) works with governments and other UN and international agencies to help developing country governments respond to the global food crisis. It helps governments prepare strategies to expand sustainable agricultural production and productivity, and helps design safety nets for the vulnerable. It clarifies issues and policy options to foster informed decision-making, and conducts in-depth analyses on the impact of the crisis at the regional and country levels. It also mobilizes resources to meet those needs.

The UN Conference on Trade and Development ([UNCTAD](#)) helps developing countries, especially the least developed, enhance their food security. It offers assistance in attracting domestic and foreign investment, and in developing sustainable agricultural practices. It helps identify markets for organic agricultural and biotrade products, and promotes the removal of non-tariff barriers. It provides farmers with market information to obtain the best prices for their products. It mobilizes support for new financial instruments to manage risk, reduce transaction costs, and improve access to food. It facilitates smallholder farmers' access to credit for seeds and fertilizer, the streamlining of customs procedures and improved transport logistics.

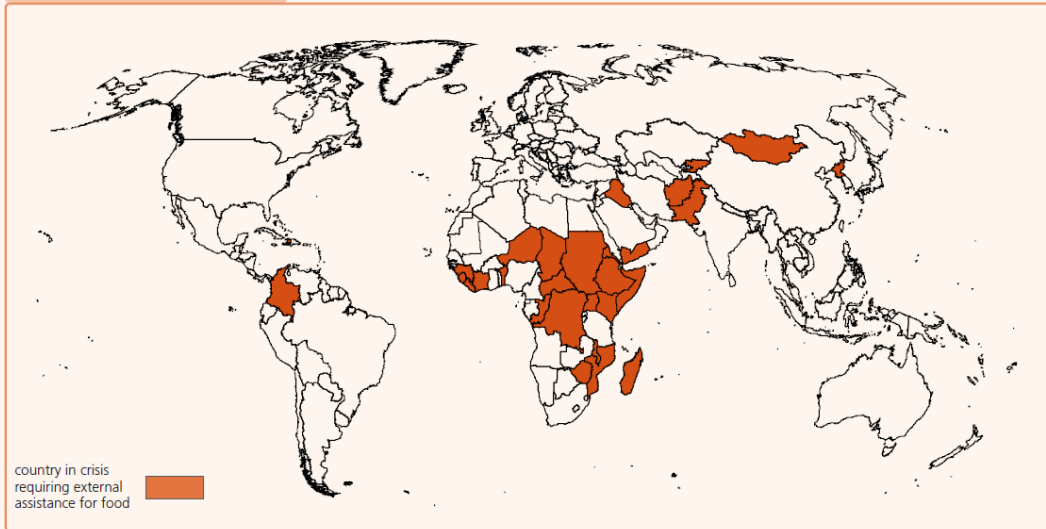
Within the United Nations Secretariat, the [Secretary-General](#) set aside a reserve of \$100 million from the UN's [Central Emergency Response Fund](#) a humanitarian fund managed by the UN *Office for the Coordination of Humanitarian Affairs* ([OCHA](#)) *on behalf of the wider* humanitarian community. As of September 2008, \$92 million had already been allocated to respond to the most immediate life-saving activities with respect to food security, agriculture, health and nutrition for priority countries.

In addition, the Department of Economic and Social Affairs ([DESA](#)) conducts cross-sectoral analysis on the current food crisis. It provides substantive support to intergovernmental meetings on this issue, as well as reports, studies, surveys and updates on various aspects of this issue.”



# Countries in crisis requiring external assistance for food<sup>1</sup>

World: 29 countries



## AFRICA (20 countries)

### Exceptional shortfall in aggregate food production/supplies

#### Zimbabwe

An estimated 1.68 million persons in rural and urban areas require food assistance despite overall improved food security conditions

### Widespread lack of access

#### Eritrea

High levels of food insecurity persist due to economic constraints and large numbers of internally displaced persons. Recent good rains improved pasture/water availability in previously dry pastoral areas

#### Liberia

Slow recovery from war-related damage. Inadequate social services and infrastructure, as well as poor market access

#### Niger

In spite of a record 2010 crop, assistance is still needed due to the lingering effects of the 2009/10 food crisis which resulted in depletion of household assets, including loss of animals and high levels of indebtedness

#### Sierra Leone

Slow recovery from war-related damage. Depreciation of currency led to higher inflation rates negatively impacting households' purchasing power and food security conditions

#### Somalia

About 2 million people are in need of food assistance due to the ongoing conflict. Conditions improved following good cereal production in the 2009/10 secondary "deyr" and 2010 main "gu" seasons

### Severe localized food insecurity

#### Benin

Severe flooding affected 680 000 people causing damage to housing, infrastructure, crops and livestock

#### Central African Republic

Civil insecurity restricts access to agricultural land, while volatile prices hamper food access

#### Chad

Large numbers of refugees located in southern and eastern regions - approximately 270 000 Sudanese and 82 000 from Central African Republic. Drought and lack of pasture led to serious livestock deaths and damage in 2009/10, notably in west-central areas of the country

#### Congo

Influx of more than 100 000 refugees since the end of 2009, increased pressure on limited food resources

#### Côte d'Ivoire

Conflict-related damage. Agriculture seriously damaged in recent years due to the lack of support services in certain parts of the country (mainly in the northern regions)

#### Dem. Rep. of Congo

Civil strife, internally displaced persons, returnees and high food prices

#### Ethiopia

Good 2010 "belg" and "meher" harvests have improved food security conditions but the estimated number of people requiring food assistance is still estimated at 2.3 million, mainly in Somali, Tigray and Oromia states

#### Guinea

Access to food is negatively affected by high prices and inflation rates

#### Kenya

An estimated 1.6 million people are food insecure, mainly in north-western pastoralist and agro-pastoralist areas, and south-eastern and coastal lowlands. Good 2010 "long rains" harvest in October-November has improved the food security situation

**Table 8. Cereal import position of LIFDCs**  
(thousand tonnes)

	2008/09 or 2009	2009/10 or 2010				2010/11 or 2011	
	Actual imports	Requirements <sup>1</sup>		Import position <sup>2</sup>		Requirements <sup>1</sup>	
		Total imports:	<i>of which food aid</i>	Total imports:	<i>of which food aid pledges</i>	Total imports:	<i>of which food aid</i>
<b>Africa</b> (43 countries)	<b>46 897</b>	<b>43 261</b>	<b>2 926</b>	<b>38 331</b>	<b>2 788</b>	<b>43 442</b>	<b>2 549</b>
North Africa	20 767	18 897	0	18 897	0	20 396	0
Eastern Africa	8 855	7 945	2 051	7 541	1 994	6 920	1 806
Southern Africa	3 705	2 977	358	2 977	358	2 816	288
Western Africa	11 639	11 563	343	7 910	298	11 392	311
Central Africa	1 932	1 880	174	1 006	138	1 918	145
<b>Asia</b> (25 countries)	<b>44 760</b>	<b>43 820</b>	<b>621</b>	<b>42 582</b>	<b>620</b>	<b>40 694</b>	<b>1 026</b>
CIS in Asia	6 219	5 643	32	5 643	32	5 564	43
Far East	21 808	22 752	335	22 608	333	21 783	843
Near East	16 733	15 425	254	14 332	254	13 347	140
<b>Central America</b> (3 countries)	<b>1 734</b>	<b>1 807</b>	<b>116</b>	<b>1 807</b>	<b>116</b>	<b>1 826</b>	<b>168</b>
<b>Oceania</b> (5 countries)	<b>391</b>	<b>391</b>	<b>0</b>	<b>253</b>	<b>0</b>	<b>401</b>	<b>0</b>
<b>Europe</b> (1 country)	<b>102</b>	<b>75</b>	<b>0</b>	<b>75</b>	<b>0</b>	<b>64</b>	<b>0</b>
<b>Total</b> (77 countries)	<b>93 884</b>	<b>89 354</b>	<b>3 663</b>	<b>83 048</b>	<b>3 524</b>	<b>86 427</b>	<b>3 743</b>

<sup>1</sup> The import requirement is the difference between utilization (food, feed, other uses, export plus closing stocks) and domestic availability (production plus opening stocks).

<sup>2</sup> Estimates based on information available as of early November 2010.

Note: Totals computed from unrounded data.

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