

Scoping Study on Food Security and Nutrition in Cambodia

Submitted by STAR Kampuchea

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Abbreviations

CMDGs	Cambodian Millennium Development Goals
CNIP	Cambodia Nutrition Investment Plan
CPRs	Common Property Resources
DD	diarrhea diseases
FAO	Food and Agriculture Organization of the United Nations
FSN	food security and nutrition
FSNIS	Food Security and Nutrition Information System
MoC	Ministry of Commerce
MoE	Ministry of Environment
MoH	Ministry of Health
MoP	Ministry of Planning
NSDP	National Strategic Development Plan
RGC	Royal Government of Cambodia
SFFSN	Strategic Framework Food Security and Nutrition in Cambodia 2008-2012

Cambodia Map (Monthivuth K. , Scoping study on food security and nutrition of Cambodia, 2011)



I- National Policy on Food Security and Nutrition

1-Nature of problem

1.1 Resource and Population of Cambodia country

Sustainable use of Cambodia's natural resources is a key factor to the country's development.

In Cambodia there are lots of natural resource those are largely provide resource for livelihood improvement especially for people who live in countryside. Those resources are metals, hydroelectric power, forestry and fisheries, agriculture and land.

As for metals, Cambodia's mineral resources appear to be limited. In the late and throughout the 1960s, however, exploration by Chinese experts in the Christian Chun Province disclosed commercially exploitable deposits of iron ore amounting to about 5.2 million tons. Chinese explorations also revealed manganese ore reserves, estimated at about 120,000 tons, in Kampong Thum Province. ^(natural resource of Cambodia, 2009)

A few thousand tons of phosphate are extracted annually in the Kampot Province and are processed locally or at a small plant in the Batdambang Province. In addition, salt and coal also may be present in Cambodia's geological strata. Rubies, sapphires, and zircons have been mined since at least the late 19th century, mostly at Ba Kev, Stung Treng Province, and at Pailin, Battambang Province. Limited gold and silver deposits have been reported in several parts of the country. ^(Wikipedia, 2009)

Hydroelectric power, the country's hydroelectric generating potential is considerable, especially from the swift current of the middle Mekong River where it flows through the Stoeng Treng and Kracheh provinces. In general, development of the country's water potential appears to be more important for the expansion of irrigation than for the production of electricity (wikipedia, 2009).

Another natural resource is the forests, Forests cover 53 percent of Cambodia's land. (development, 2009). This has covers approximately 70 percent of the country and which potentially constitute a second pillar of the economy in addition to the primary o **(development, 2009)**ne, agriculture. A survey in the 1960s disclosed that Cambodia had more than 130,000 square kilometers of forests that contained many species of tropical growth and trees but not teak or other valuable sources of hardwood. Some destruction of the forest environment undoubtedly occurred in the war that followed in the 1970s, but its extent has not been determined. Most of the heavy fighting took place in areas uncovered by dense tropical jungle. As of late 1987, forest resources had not yet been fully exploited because of poor security in the countryside and a lack of electrical and mechanical equipment, such as power tools and lumber trucks. Nevertheless, the Cambodian government reportedly has discussed with Vietnam the possibility of coordinated reforestation programs. Timber and firewood are the main forest products. Timber is considered one of the four economic initiatives of the government's First Plan. Timber production was projected to reach a peak of 200,000 cubic meters in 1990 (wikipedia, 2009).

The forests of Cambodia are diverse and comprise a variety of evergreen, deciduous, mixed and mangrove forest types. Current estimates of remaining natural forest cover vary considerably, but the consensus is that about half of Cambodia's land area has some form of forest cover. Weak governance and unsustainable resource use, shifting cultivation in the upland areas, especially in the northeast of the country, and forest clearing for agriculture are causing rapid deforestation. As a result, Cambodia's rich natural habitats have been significantly degraded, affecting the quality and quantity of habitat for biodiversity and non-timber forest resources, both important elements of food and livelihood security. (web.worldbank.org)

Furthermore Fisheries is rich resource in Cambodia too. Cambodia's preferred source of protein is freshwater fish, caught mainly from the Tonle Sap and from the Tonle Sab, the Mekong, and the Basak rivers. Cambodians eat it fresh, salted, smoked, or made into fish sauce and paste. A fishing program, developed with Western assistance, was very successful in that it more than quadrupled the output of inland freshwater fish in three years, from 15,000 tons in 1979 to 68,700 tons in 1982, a peak year. After leveling off, output declined somewhat, dipping to 62,000 tons in 1986. The 1986 total was less than half the prewar figure of some 125,000 tons a year. Saltwater fishing was less developed, and the output was insignificant—less than 10 percent of the total catch. According to the First Plan, fisheries were projected to increase their annual output to 130,000 metric tons by 1990. (wikipedia, Agriculture in cambodia, 2010)

On the other hand, the Composition by Cambodia's agriculture sector show that : crops: 54%, fisheries: 25%, livestock: 15% and forestry: 6%) . According to the

achievements against of NSDP's indicator, in 2011 rice Cambodia have produce total of rice 8.78 million tones. (Ngin Chhay, 2012).

Rice is the main crop in Cambodia. Since 2007 the yield and production of rice increased significantly. The Ministry of Agriculture, Forestry and Fisheries reported that the 2011 wet season harvest was 6.67 million metric tonnes², 1.9% above the 6.55 million metric tons in 2010 (Cambodia Food security and Nutrition quarterly Bulletin, 2011).

Both wet season and dry season rice harvests reached record highs in 2011/12. The dry season rice harvest was over 20% higher than the previous year's, primarily due to the increase in harvested area. The increased rice cultivation in the dry season was partially a response to the large crop damage caused by the floods in September/October 2011 and also due to the favorable planting conditions stemming from higher rainfall and increased irrigated areas (Cambodian food security and nutrition quarterly bulletin, 2012).

Cambodia's population is estimated at 13.4 million according to the last population survey undertaken in 2008. With a median age of only 21.0 in 2008, the population of Cambodia is young on average. Children of age under 15 represent about 34 per cent of the total population whereas the elderly aged 65 or above only make up for about 4 per cent of the total population. The total fertility rate is still high at 3.1, although it shows a decreasing trend; the population growth rate is estimated at 1.5 per cent per annum. At 62.5 years on average, the life expectancy at birth is relatively low, due to, mainly, the high child and infant mortality rates. The majority of Cambodia's population still lives in rural areas, at 80 per cent of total, while only 20 per cent are urban dwellers (Social protection expenditure and performance review, 2012). Total employment in 2008 was estimated at 6.8 million persons, including about 2.9 million unpaid family workers. Among the 3.9 million paid workers in 2008, about 1.2 million were paid employees, whereas the remaining 2.7 million were self-employed or own-account workers.

Cambodia's health status is among the poorest in Southeast Asia. A heavy burden of communicable diseases and high child and maternal mortality rates still affects many Cambodians caught in a vicious cycle of ill health, debt, and poverty that is delaying the country's development. Although progress has been achieved in strengthening the national health system and improving access to health care for the poor, continued effort is needed to further improve the access to quality health care services and the protection of households against catastrophic health expenditures. Household out-of-pocket spending for health remains high at an estimated 55 per cent of total national health expenditure. Furthermore, a high percentage thereof (67%) is spent outside the public health system. Total national health expenditure for the year 2010 is estimated at 848 million US\$, about 7.1 per cent of GDP, which is high in comparison to other countries in the region. Total health expenditure per capita for the year 2010 is estimated at about 62 US\$.

1.2 Poverty and hunger in Cambodia

Despite impressive economic growth in recent years, poverty remains a major concern in Cambodia. In 2004, 34.7 percent of Cambodians lived below the poverty line¹ (Strategic framework for food security in Cambodia in 2008-2012) and (Monthivuth, 2011). Amongst these people, 93.4 percent (4.4 million) were located in rural areas with the remaining 6.2 percent (0.3 million) residing in urban areas (Monthivuth, 2011), (A poverty profile of Cambodia 2004, MoP 2006). Geographically, Phnom Penh had the lowest poverty rate (4.6 percent) in 2004. The Plateau/Mountains is the poorest zone with a poverty rate of 52 percent while the Tonle Sap region has a poverty rate of 42.8 percent compared with 32 percent in the Plains and 27 percent in the Coastal zone. The Plains has the largest share of the poor (40 percent) followed by Tonle Sap (37 percent), Plateau/Mountains (16 percent) and the Coastal zone (6 percent) (Scoping study on food security and nutrition of Cambodia, 2011) and (Food Security Support Programme 2009-2013 under the Strategy on Agriculture and Water jointly prepared by the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the Ministry of Water Resources and Meteorology (MoWRAM) in consultation with the Technical Working Group on Agriculture and Water (TWGAW).

Poverty in Cambodia is closely associated with lack of food security and nutrition. Nationally, 23 percent of the Cambodian population, or 3 million people, were food-deprived in 2003-2004, consuming less than the minimum daily energy requirement of 1715 kcal/day. In 2005, more than 37 percent (630,000) of Cambodian children under the age of five were suffering from chronic malnutrition (stunting), while 36 percent of the children under the age of five were underweight, and 7 percent were acutely malnourished (wasted). More than 60 percent of the children under the age of two suffered from anemia. Malnutrition is also a major cause of the high level of maternal and infant mortality (Monthivuth K., scoping study on food security and nutrition of Cambodia, 2011) and (Strategic framework of food security and nutrition 2008-2012).

The social and economic costs of malnutrition in the Cambodian population are high. Social costs include damage to individual health and physiological development, limiting the overall human potential of the malnourished and leading to high levels of suffering, debilitation and premature death. Economic costs include limitations on the development of the economy resulting from lower educational achievement, higher health costs, lower labor force quality and increased vulnerability to the impacts of natural hazards.

1.3 State of hunger and malnutrition and impact on rural poor

Food security exists when all people at all times, have physical and economic access to sufficient, safe and nutritious food meet their dietary needs and food preferences for an active and healthy life (WFS, 1996). Food security is built on four pillars: Food availability, people must have the possibility to acquire food for their consumption; food must be safe to eat and the food production and distribution system has to be able to recover from unexpected stresses, such as natural catastrophes (Jenny Turunen, 2011).

Rice is the main staple food in Cambodia and food security is mainly, though not exclusively, understood as the availability of rice in the village and the capacity of a household to get sufficient rice for its needs (Jenny Turunen, LIVELIHOOD RESILIENCE AND FOOD SECURITY IN CAMBODIA, 2011). Livelihood strategies of the rural villages are based on seasonality and composing the livelihood from many different sources. About 80% of the Cambodian population is living in the rural areas and cultivating land (UNICEF, 2010). Throughout the year the economy of the rural villages is based on natural resource exploitation, which is supplemented with services and small scale industry, such as construction work.

Many study said that woman and children is facing with malnutrition in Cambodia currently. Especially women and children whom have living in a very poor family. Maternal malnutrition will have serious long- term consequences for the health of the Cambodian population and for its economic. Poor nutrition status at the time of conception and or inadequate nutrition during pregnancy not only places a woman at higher risk for dying while giving birth, it has a negative impact on birth weight and early development. Low birth weight places a heavy financial burden on the health system and causes higher mortality, morbidity, and disability in infancy and childhood. The financial burden on the health system is not just for treating low birth weight babies; it also includes dealing with the negative impact of low birth weight on health outcomes in adult life (maternal nutrition fact sheet-Cambodia, 2012). Around 1 of 5 woman have low body mass index, and this has no changed since 2005. The CMDG target for 2015 is 8%. In 2010 the anemia rate of woman is 44%, 12 percentages points higher than the 2015 target. Anemia among pregnant woman has

Decreased 4 percentage point in the last 5 years, but the current rate of 53% is well above the 2010 CMDG target of 39% (Maternal Nutrition fact Sheet-Cambodia, 2011).

On the other hand, child malnutrition today will have serious long-term consequences for the health of the Cambodian population and for its economic development. Inadequate growth in the first few years of life not only s impact child health and mortality, it also leads to adverse health and economic consequences for the individual's entire and can even affect the next generation (Early Childhood Nutrition Fact Sheet- Cambodia, 2011). Child malnutrition is one of the biggest health problems that Cambodia is facing currently. Cambodia is among the 15 worst countries globally for child malnutrition. Household survey since 2005 showing that 28% of children are underweight. At 39.9%, Cambodia has the 13th highest prevalence of short children in the world, and the highest in the region. It is higher than for a healthy population. From 2005 to 2010 the percentage of children too thin has crossed the IPC emergency threshold, increasing from 8.4%to 10.9% (Early childhood Nutrition fact sheet-Cambodia, 2011).

Therefore, the 4th National Seminar on Food Security and Nutrition under the Theme: "Improving Child and Maternal Nutrition in Cambodia" was taken place on 21-22 May 2012. The national seminar was joined by relevant ministries, provincial authorities, development partners, civil societies and private sectors to present on 4 main objectives (www.foosecurity.gov.kh).

1.4 Agriculture contribute to the Economy and Food security

The agriculture in sector in Cambodia still contributes the dominant quantity to the GDP. It is the most importance source of incomes and rural livelihood for around 80% of the Cambodia population. Since 2000, Cambodia has achieved overall national rice self sufficiency, although there are still regional and local deficit regions The aggregated rice production has been stable in the last five years, with a surplus at the national level and according to official data national self-sufficiency in rice production was achieved in 2005 following years of deficiency (MAFF2010).The increasing harvests since 2005 have boosted Cambodia's agrarian growth rate to 13.5% in 2007 and 2009. Severe disparities remain predominant at regional and particular at rural household level. A growing number of families are not able to survive based on their own rice production, especially in the areas affected by terrible floods in the Mekong floodplain or irregular severe drought on poor sandy soils in 2004-2005. However, an unconfirmed report from the IMF (2006) shows that farm output has continued rising since 2003 with better seeds and wider use of fertilizers.

1-4-1 Rice production pattern

Rice, the major staple food, continues to be the principal commodity in this sector. Officially, the national average yield of rice is estimated to be between 1.65 and 1.8t/ ha in the wet season and 2.05 t/ha in total which is low compared to other rice producing countries in the region like Vietnam 4.8t/ha and Lao PDR with 3.29t/ha in 2007 (IRRI 2008). During the last three decades, most of the Cambodian efforts have gone into slow improvements of the traditional smallholder rice farming system.

The average size of agricultural land for more than 2 million Cambodian farm households is about one ha or less than one hectare. In areas identified as high risk in terms of food security loss, the average size is 0.75 ha, (FAO, 1999), along with more than 1 million of the rural population, predominantly in the southern lowlands have no agricultural lands (Sokha et al 2005).

The rice production in 2002 was on the lowest level of production since the 1998 drought year (MAFF 2010). All domestic rice prices constantly increased in the period between 2000 and 2009.

In 2007 prices surged and more than doubled within a single year span. Local and regional rice markets seem to be integrated as the prices of rice all roughly follow very similar trends.

Data of average farm gate price of paddy in December 2003 shows that in provinces located around Tonle Sap Lake as well as the upper and central plains of Cambodia the price is lower

while price of rice in remote provinces depending mainly on market accessibility and small local production. Besides variety and other agronomic reasons the high

geographic variation of rice yields suggests that problems of storage, transport and alternative non farming income opportunities exist as well.

As Cambodia's population is increasing rapidly, and employment opportunities in the non agricultural sector are still limited, an increasing number of the rural youth are facing problems of landlessness and unemployment. Consequently agricultural landlessness is a serious and prevailing issue to Cambodian poor farmers (CEDAC 2004). Consequentially, rural households operate in a risky environment of regular flood and irregular drought crisis, food insecurity as well as crop and animal losses through diseases caused by a weak and ineffective veterinarian service.

1-4-2 Others staple food

Obvious regional and economical disparities exist in the maize and other staple food sector as well. The main reason is a growing market for maize and maize fodder products in Thailand

and excellent trading opportunities in Southern Viet Nam. Recently maize became the second largest food crop among Cambodian farmers. First between 1980 and 1990 the maize growing area decreased significantly but since the opening to a market economy the maize growing area is conversely increasing steadily from 71,460 in 2000 to more than 200,000 ha 2008 (MAFF 2010). The main maize growing area is located in Battambang province representing more than 61% of the total maize growing area in Cambodian. The average maize yield per hectare with 5.4 t/ ha in Battambang is even higher compared to the national average yield of 4.3 ton/ha (FAO-Stat 2008). Reasons for a geographic trading advantage of Battambang and Paillin in comparison to other provinces are strong influences from neighbouring Thailand and Thai organized contract farming of Cambodian farmers.

Production of other staple crops for the national food market has decreased in the last 10 years while production of cash crops increases rapidly with the introduction of contract farming and internationally leased agricultural concessions. Production of other significant crops like sugar cane, cassava, cashew and sesame have steadily risen for the last six years (MAFF 2008). The number of permanent cultivated crops like fruit trees and plantation trees increases constantly by innovations like Pitaya (*Hylocereus spec.*) and even grape. Besides rice, banana is still the most favorable crop among Cambodian farmers. Banana is grown all over the country while Kampong Cham remains well known as a major banana export province.

1-4-3 Secured food production and supply

Agriculture plays the most important role in Cambodian society by ensuring food security at community and national level as well as in the provision of employment and income opportunity for a growing population. About 75% to 85% of the population is employed in the primary sector, 65% does simply rice farming and around 90% of Cambodia's poor citizen lives in rural areas (World Bank 2005).

Depending on the type or form of farming practices, agriculture could improve important environmental protection issues like watershed protection, ensuring quality of water and soil resource and biodiversity.

Today, trends and processes in land occupation and land use change are resulting in disparities in the Cambodian agricultural sector. Historically, differences in soil and water resources and subsequent suitable agricultural potential were the predominant factors for population distribution. Recent population dynamics are driven by land occupation of international investors and land shortage in the lowlands.

Land use planning issues and economically motivated large scale land distributions characterize new disparities and transitions in the agrarian sector of Cambodia. Continuous intervention of the state into land regulations, ownership policy, land use planning measures and distribution of land use rights to large scale agro-industrial investors illustrate the Cambodian practice.

In 1991 Cambodia transferred its collective economy into a modern market economy. Since then land use patterns have undergone an intensive agrarian transition. Land and access to land became one of the most crucial factors in the Cambodian agriculture sector.

Still the agrarian production is focused on subsistence and smallholder farming systems with rainfed rice as the major agricultural crop and traditional source of carbohydrate, along with legumes, soybean is important followed by mung-bean and the oilseed crops including groundnut and sesame. Further, among commercial crops, sugar cane followed by jute and tobacco is commonly grown (FAOSTAT 2008).

Vegetables mostly occupy only village gardens and small fields around Phnom Penh, while economic cultivation of cassava and sweet potato is rising on large scale concessions. The customary significance of rice as the major staple food in Cambodia is emphasized by an average of 75-80 % of all calories derived from rice. According to O'BRIEN (1999) 86% of the total rice cropping area in Cambodia is either irrigated or rainfed lowland rice, only 8% is dry season rice, 4% is floating rice and 2% is upland rice (mapping by the author, based on topographic and agricultural data (MAFF 2005, JICA 2002). Lowland rice with barely more than one crop per year represents the most abundant rice cultivation system, dependant on rainfall pattern and surface runoff for its water supply. Dry season and irrigated rice production is limited to areas close to major rivers and managed floodplains. Floating rice is grown in low-lying depressions that accumulate floodwater and is further divided based on depth and duration of the water (NESBITT, 1996). Rainfed rice production in the uplands is characterized by non banded fields and is primarily associated with shifting agriculture.

1-4-4 Economic trends of agricultural production

Agriculture production is essential to the domestic economy of Cambodia and also is the main employment factor in rural Cambodia. According to FAO findings subsistence consumption absorbs approximately 55 to 60 % of the overall agricultural output (FAOSTAT 2008). As a result, the yearly average GDP per capita in rural areas remains very low around 125 \$ (Sophal 2008), compared to 280 \$ nationwide and more than 350 \$ in urban environment (World Bank 2008). Rural agriculture is predominantly organized on the basis of smallholder farmer communities and families. Significant productivity gaps separate Cambodia into three major areas, productive south-eastern Mekong floodplains and north-western lowlands along the border to Thailand and less productive uplands regions.

Various agricultural reports on Cambodia from 1995 until 2009, show that gross production of agricultural and food products is increasing, rice paddy area and production slightly decreases while the average yield per hectare slightly increases. But Cambodia still lags far behind neighboring states of the Mekong catchment and remains still very low in international terms.

In 1994, agriculture represented 45 to 50% of GDP, while in 2002 it still represents 36.2 % of GDP, respectively (ADB, 2005). Currently, 28.4% of Cambodia's Gross Domestic Product is derived from the agricultural sector (World Bank, 2009). Following a constant increase of 2-3 % over 5 years the agriculture sector growth remains stable mainly due to drought and late floods, as well as a declining forestry production of -9.3% since 2007 (MAFF-Statistics 2009). Paddy production volumes reported by MAFF (2010) increases slowly since 2007 (Fig.2) compared to the non robust 14.8% growth in 2005.

The area of national maize harvest has dropped over the last five years but yield increased while cereals harvest area production and yield shows no major changes (MAFF 2008). The reported harvest area and the production of roots, tubers and oil is growing, mainly by an increase of yields, except of oil production which was increased by enlarged production area due to large scale commercial agricultural concessions. During the last five years the production of fruits and vegetables has been steadily increased.

Today, the state sector plays the most important role in agricultural production by allocating large scale economic agricultural and forest concessions, while staying directly involved in rubber and oil production, only. There are eight state rubber plantation companies, a joint venture company in Tumring, Kampong Thom Province, and a privatized oil palm plantation in Koh Kong Province near Srey Ambrel. The area of industrial exploited rubber plantation is estimated at 55,900 ha (MAFF 2010).

Throughout Cambodia, the chemical fertilizer and pesticide market is rapidly expanding and their use is extremely common in Cambodian agriculture according to a CEDAC, study conducted in 2004 and another survey by Touch and DeKorte (2008). Two third of Cambodian farmers interviewed are using pesticides at least for one of their crops especially in the vegetable mung bean and water melon

production. Significant pesticide use is also incorporated into dry season rice and tobacco production. The majority of Cambodian farmers believes that increased agricultural production can only be achieved by using more modern inputs rather than using modern inputs adequate and properly. This approach does contribute to increased production, but at higher costs on imported/ external inputs especially fertilizer and pesticides. Since these inputs are mainly imported negative effects are frequent on farmers' household income and also relevant to the national economy. It is estimated that Cambodia has spent around \$US 64 million USD on chemical fertilizer and pesticides (FAO 2010).

1.6 Trend in food price since 2007 and affective

Cambodia's economy and households were significantly exposed to the recent **food, fuel and financial crises**. As Cambodia becomes more integrated into the global economy, the impact of external economic shocks is likely to become greater.

The impact of price fluctuations is complex, and the aggregate poverty impacts of the 2007-2008 price rises (the price of rice, the staple food crop of Cambodia, increased by approximately 100% between 2007 and 2008) are yet to be determined (pending analysis of the Cambodia Socio-economic Survey (CSES) 2008). The poor are net food buyers, which mean they were least able to cope with the steep rise in prices. There were some winners (for example milled rice sellers, oil sellers and agricultural day laborers).

Poor and vulnerable households have also been hit hard by the economic crisis, with significant social and poverty impacts in constrained circumstances. There are concerns that women may have been disproportionately affected, with a substantial loss of employment in the garment industry (which predominantly employs female workers), increased risk of domestic violence and greater vulnerability to trafficking and exploitation in the commercial sex industry. Low-skilled male workers have also been vulnerable, in particular in the male-dominated construction industry. The effects of the economic crisis for children of poor and vulnerable households are also likely to have been significant, with a risk of increasing child labor and poor families switching to less nutritious food and deferring health treatment (NSPS for poor and Vulnerable 2011-2015).

2- Shifts in the Government's since food price crisis in 2007

2.1 Government's policy focus on Agriculture Development

Rice is the main staple food in Cambodia and food security is mainly, though not exclusively, under-stood as the availability of rice in the village and the capacity of a household to get sufficient rice for its needs (Jenny Turunen, LIVELIHOOD RESILIENCE AND FOOD SECURITY IN CAMBODIA, 2011)

According to the national development plan there are four keys policies priority and action. Those are: 1. Good Governance (The Core of the Rectangular Strategy) 2.Environment for the Implementation of the Rectangular Strategy, 3.Enhancement

of the Agricultural sector, and 4. Further Rehabilitation and construction of Physical Infrastructure.

To enhance of the agriculture sector, Cambodia's policy have focusing on 4 points. Such as 1.Improving Agricultural Productivity and Diversification, 2.Land Reform and Clearing of Mines,3. Fisheries Reform and 4. Forestry Reform.

The value-added of agriculture increased on an average by 7.2 percent per annum between 2003-2007, compared to 1.6 percent during 1998-2002 and 4.9 percent during 1993-1997. Cambodia has achieved 2.5 tons per hectare of rice yield during the period 2004-2008, the highest yield in Cambodian history, due to more attention to researches on and extension of agricultural technologies aiming at enhancing farmers' know-how in cropping practices; increased investments in irrigation network, improvement in water management, increase in credit made available by commercial banks and microfinance institutions, and increasing use of better cultivation practices. Agricultural intensification has gradually taken roots. Moreover, the increase in prices of rice, maize, soybean, cassava and rubber provides further incentives to the implementation of agricultural diversification policy (National strategic plan update 2009-2013, June,2010).Rubber provides further incentives to the implementation of agricultural diversification policy.

The Royal Government of the Fourth Legislature will continue to place priority on increasing agricultural productivity and diversification as well as promoting agro-industries. Also to pay further attention to increased production by shifting from extension of cultivated area to intensive farming on the existing land. This is to increase production, employment, and rural income, and ensure food security as well as to increase export of agricultural products, especially finished goods, in particular rice. This will be achieved through an integrated approach including increased proper use of improved agricultural inputs, agricultural extension, research and development, construction and maintenance of the rural infrastructure, especially irrigation network, expansion of rural credit and microfinance, agricultural market development, organization of farmer communities and better management of agricultural land.

To this end, the Royal Government will make further efforts to expand the system of technical and agricultural extension services by rolling them out to the district level and creating linkages with a community level volunteer network as well as with the agricultural services being provided within the framework of various development projects. The Royal Government will foster partnership between small land holders and large-scale agricultural farms or corporations, and between economic and social land concessionaires, especially those involved in agro industries such as rubber plantation in accordance with the Strategic Plan for the Development of Rubber, Cashew, and Sugarcane. The Royal Government will encourage multi-purpose farms in order to increase productivity in animal husbandry and multi-crops farming through integrated farming.

Moreover, the Royal Government will create an enabling environment to attract private investors, domestic and foreign, and welcomes the contribution from NGOs to ensure the transfer of know-how and new technology to farmers in regard to crop farming and animal rearing. It will further strive toward linking farmers to the regional

and global agricultural markets by creating necessary institutional mechanism and through efforts to make the quality of agricultural products conform to international standards.

2.2 Planned Actions to Implement the Priorities Policies

To implement RGC's priority policies for the Fourth Legislature, the Ministry of Agriculture, Fisheries and Forestry (MAFF) will continue its work on updating the Agriculture Sector Strategy and seeking support to implement the strategy through a sector-wide programme. In terms of specific actions, it will:

- Improve soil fertility, conduct soil classification for crop zoning, and formulate land use plan;
- Implement the National Action Programme (NAP) to combat land degradation and Desertification in Cambodia;
- Strengthen research on and development of crop seeds and crop production technologies;
- Conduct mainstreaming the use of high-quality and high-yielding crop varieties/ seeds;
- Promote crop intensification and diversification;
- Improve knowledge on crop protection;
- Improve quality of produces;
- Strengthen inspection capacity and services for quality and safety of agricultural products;
- Strengthen and expand agricultural extension structure and system through monitoring and evaluation on effectiveness of the agricultural extension works;
- Enhance the capacity of agricultural extension officers and village-based agricultural extension workers through education and training on agricultural extension methodologies;
- Foster the strengthening and development of Farmer Organizations and Agricultural Communities.
- Develop and strengthen agricultural management systems and norms for the technological application in order to contribute to the formulation of local development plans;
- Strengthen professional skills and talents of concerned agricultural officers at all levels;
- Improve structure, roles and responsibilities of the Ministry in order to ensure sustainable agricultural extension;
- Strengthen the effectiveness of the dissemination of agricultural information and technologies through public mass media;
- Increase food crop production and farmer families' income through the implementation of agricultural extension techniques in rural areas;
- Promote the dissemination of information on requirements and conditions of both domestic and external markets under the framework of global trading regime to all concerned stakeholders;
- Strengthen research and development on agricultural machinery techniques and Agricultural tools;

- Expand the development and application of agricultural machineries and tools;
- Improve post-harvest preservation technologies;
- Strengthen and expand physical infrastructures necessary for agricultural research, development and technology transfer;
- Further implement the National Action Programme (NAP) in relation to the mainstreaming and rising of awareness of gender issues in agriculture sector;
- Promote effective enforcement of related legal and regulatory frameworks;
- Improve the attribute of rice varieties that have been released and are widely used so that they are able to be resistant to drought, flood, and insect pests of;
- Improve yield and quality of crops including rice crop, cereal crops, fruit trees, tuber crops, fiber crops, vegetable crops and ornamental crops, etc.;
- Strengthen capacity of laboratories for soil, water, insect pest and disease analysis as well as tissue culture;
- Collect, preserve and use germ-plasma of different crops;
- Develop sustainable land preparation techniques for flood-recession rice;
- Develop agricultural tools for seeding, weeding, and tools for harvesting peanut grains;
- Develop storage and packaging facilities for agricultural products;
- Develop technology package for farming systems to increase rice yield through the application of CARDI-released technologies by farmers in the resource-poor and vulnerable regions as well as promote and improve the model-farming system;
- Examine the long-term trends of soil fertility for rice production using organic fertilizers in the rain-fed lowland sandy soils;
- Manage, maintain and develop laboratories for soil, plants and water analysis;
- Examine the seasonal changes in water quality that affects crop production.
- Increase soil productivity in lowland areas for rice production with economic and environmental sustainability;
- Diversify lowland cropping with legumes after the harvest of wet-season rice;
- Increase soil productivity in upland areas for upland crop production with economic and environmental sustainability;
- Collect insect pests and diseases adversely affecting vegetables and cereal crops and preserve them at laboratories in institutes and provinces;
- Carry out researches to develop technology for increasing mushroom culture and production;
- Ensure that the organic and inorganic pesticides that are used meet appropriate standards and are effective in enhancing rice and vegetable production;
- Encourage training and agricultural technology transfer through training courses, workshops, conferences, publication and website;
- Develop legal and regulatory framework and human resource development;
- Reduce animal morbidity and mortality rates;
- Improving public health particularly in relation to zoonotic diseases and food safety;
- Promote animal feed production as well as improve the quality animal breeding stocks;
- Promote the use of animal manures for bio-gas production;

- Enhance and strengthen research and extension programmers on livestock production and veterinary activities.
- Improve credit services for livestock production;
- Promote the investment in livestock production and veterinary activities and foster the markets for animals and animal-originated products;
- Promote the development of and investment in rubbers (household-/private-based) and develop the rubber information system;
- Improve and strengthen the legal and regulatory framework and good governance in rubber sector.

In order to promote and growth agricultural production in 2009-2013, the Ministry of Agriculture, Fisheries and Forestry (MAFF) has drafted the laws and regulations as follows:

- Law on Agricultural Insecticides and Agricultural Materials;
 - Law on Agricultural Communities;
 - Law on Agricultural Management and Transfer of Agricultural Technology;
 - Law on Animal Production and Animal Health;
 - Law on Rubber;
 - Law on Plant Protection;
 - Law on Agricultural Product Quality and Safety;
 - Law on Agricultural Land Management;
 - Sub-Degree on Contractual Agricultural Production;
 - Sub-Degree on Agricultural Machinery Management and Agricultural Tools;
 - Sub-Degree on Establishment of National Forest Development Fund and organization and Functioning of National Forest Development Committee;
 - Sub-Degree on Certificate of Agricultural Product Quality and Safety;
 - Sub-Degree on Procedures on the Establishment or Dissolving of Controlled Fishing Areas;
 - Sub-Degree on Boundaries of Fishing Areas;
 - Sub-decree on the Legal Procedures on Investments, Public Bidding, Contractual Leasing and Payment of Fishing Fees;
 - Sub-Degree on Uniform, Sign and Ranks of Forestry Administration Officers;
- and
- National Policy on Rubber

By strategic frame work of food security and nutrition (SFFSN), had established a goal of FSN, said that ***“All Cambodians have physical and economic access to sufficient, safe, and nutritious food, at all times, to meet their dietary needs and food preferences for an active and healthy life.”*** (CARD, May,2008). The SFFSN has five Objectives to reach its goal. Each FSN’s objective will require the funding and implementation of a range of priority actions requiring service and infrastructure investments over a range of sectors by a number of government ministries and coordination bodies. The objective of Food-insecure households’ **increase their food access** by increasing household income is one objective of

among SFFSN's five objectives. This objective is achieved through progress in four areas:

There are below objectives:

1. Increasing wage employment opportunities for the poor and food-insecure.
2. Increasing micro-enterprise opportunities for the poor and food-insecure.
3. Developing market infrastructure and services.
4. Developing transport infrastructure and services.

As economic terms the rural poor and food-insecure are a numerically large component of the private sector, specifically in the informal sector. Improving household incomes and employment of the food-insecure is also intrinsic to improving gender equity, poverty alleviation, youth incomes and employment (37 percent of the population is aged 10-24 years) and slowing down rural-urban migration⁵⁹.

Sources of cash income to buy food do include crop and livestock production and the harvest of forest and fisheries. However, as indicated above, cash income is limited. It is broadly recognized that cash income from the formal or modern sector economy, notably employment in large garment sector enterprises, is an important source of income and remittances for more than 300,000 mainly rural and poorer women. What is often not sufficiently recognized is the significant role of informal sector casual wage labor and household micro-enterprises in producing cash to buy food among poor and food-insecure rural Cambodians⁶⁰.

Among the poorest two quintiles of rural households in 2004, the cash value share of home-produced food was 33-36 percent and the cash value share of purchased food was 64-67 percent⁶¹. Another recent study⁶² indicates that among rural households engaged in agriculture, 46 percent of dietary value comes from purchased food, 45 percent from own production and the balance from other sources. This reveals a high level of dependency on purchased foods for food security and a high vulnerability to food price fluctuations among rural households engaged in agriculture. Food prices increased by over 24 percent from January 2007 to January 2008 in Cambodia⁶³. The current raise of food prices is therefore a serious challenge not only for the urban population but also for large parts of the rural poor.

The increase of food prices is probably a longer-term worldwide phenomenon linked to increased food demand of emerging economies, higher cost of fuel and agricultural inputs, alternative use of agricultural land (for bio-fuel production), adverse affects of climate change on production, and speculation on commodity markets. However, local policies and measures to counteract or mitigate effects of the global trend are addressed in the SFFSN⁶⁴.

Some measurements of the prevalence of food deprivation are based on income versus the cost of a food basket. The most severe classification of food deprivation is "critical food poverty", defined as those households earning an income lower than the cost of a food basket corresponding to the minimum dietary energy requirement (MDER). Nationally the prevalence of critical food poverty was 21.4 percent of all

households. There were large variations between social groups and between provinces.

A broader group of the food-insecure is those suffering from “food poverty”. This is a group earning an income lower than the cost of a food basket corresponding to the average dietary energy requirement (ADER) of 2120 kcal/person/day 65. Nationally the prevalence of food poverty was 57 percent of all households. There were large variations between groups at the sub-national level. Those involved in agriculture had a food poverty rate of almost 70 percent of households.

1-3 Compliance to international agreement and program

Cambodia national plan and Strategic frame work of food security and nutrition is compliance to international agreement and programs, such as world food summit. Food security is recognized world-wide as a fundamental dimension of national development, good governance and basic human rights.

Other initiatives undertaken by various concerned stakeholders that aim to improve FSN related data collection, analysis, presentation and dissemination include (Monthivuth K. , scoping study on food security and nutrition information in cambodia, 2011):

- In 2007 a national workshop on the need for a nutritional surveillance system for Cambodia organized by CARD recommended to focus first on promoting the harmonization, analysis and use of existing data sources (national survey from NIS and administrative statistics) with regard to FSN.
- In 2007 FAO/EC "Food Security Information for Action" supported NIS to analyze food consumption based on CSES 2004 data and capacities for crop yield forecasting as well as the production of FSN information products.
- In 2007 WFP, in cooperation with CARD, developed a web based "Food Security Atlas" for Cambodia which was updated in 2008 and a prototype "Integrated Food Security Phase Classification" (IPC) map for Cambodia.
- In mid-2008, CDRI, in cooperation with WFP, carried out a survey on the impact of high food prices in Cambodia.
- In November 2008, with support from UNICEF, NIS carried out the Cambodia Anthropometric Survey (CAS) to follow up on the impact of rising food prices on nutrition and the health status of children and mothers. Capacities for nutrition data collection and analysis in NIS were built up.
- In 2006, MoP developed a database on poor households, currently covering more than 7000 villages.
- Recently a new phase of the FAO/EC project was launched focusing on market information analysis, agricultural disaster preparedness/climate change analysis and chronic food insecurity and vulnerability assessment.

A new project for Cambodia (MDG-Fund), jointly implemented by four UN Agencies and relevant line ministries under the coordination of CARD, intends to establish an integrated food security and nutrition monitoring system based on existing information systems and surveys (Monthivuth K. , Scoping study on foode security and nutrition information in cambodia, 2011).

II- Agriculture program for food Security and Nutrition in the Country

The **National Social Protection Strategy (NSPS)** complements other sectoral policy, plans and strategies of line ministries and stakeholders involved directly or indirectly in social protection.

The strategy is aligned with and makes operational the priority actions laid out in the Rectangular Strategy and the National Strategic Development Plan (NSDP) Update 2009-2013. The NSPS has been developed based on a consultative process with active participation from line ministries at both national and sub-national level, development partners and civil society.

During the Cambodia Development Cooperation Forum (CDCF) on 3-4 December 2008, the Royal Government of Cambodia (RGC) and development partners agreed to undertake a scoping and mapping exercise and gap analysis on existing social safety nets and to identify a policy direction towards the development of a more integrated social safety net system commensurate to the socioeconomic situation of Cambodia. The Council for Agricultural and Rural Development (CARD) was tasked with ensuring effective coordination among the stakeholders involved.

In February 2009, CARD set up an interim working group involving representatives from line ministries and development partners to develop a concept note and inventory of existing social safety net programmes. In July 2009, CARD organized the National Forum on Food Security and Nutrition under the theme of Social Safety Nets in Cambodia and was mandated to coordinate the development of a National Social Protection Strategy (NSPS) for the Poor and Vulnerable. A number of technical consultations and field studies were carried out to review social protection policy, focusing on several aspects of social interventions, including cash transfer to address maternal and child nutrition, public work programmes, education and child labour. At the beginning of June 2010, the NSPS was presented to the 3rd CDCF for endorsement and collaboration. Upcoming tasks will include a comprehensive analysis and detailed costing exercise for the design of specific activities in the strategy (NSPS for poor and vulnerable 2011-2015).

The broad vision of the NSPS includes contributory social security (social insurance) for formal sector and civil servants, as well as a high level of human development and appropriate opportunities for all Cambodians. The NSPS envisions that **all Cambodians, especially the poor and vulnerable, will benefit from improved social safety nets and social security as an integral part of a sustainable, affordable and effective national social protection system.**

The main goal of the NSPS is that **poor and vulnerable Cambodians will be increasingly protected against chronic poverty and hunger, shock**

Within the framework set in place for working towards 2015, the NSPS will link existing programmes by establishing systematic and integrated objectives to enable improved service delivery for the poor and vulnerable, protection from poverty and the promotion of investments in human capital (NSPS for poor and Vulnerable 2011-2015). To achieve this, the NSPS entails several strategic steps:

- Promote the development of a mix of programmes that cover both chronic and transient poverty as well as hunger and that also help promote human capital.
- Strengthen the coordination, scaling-up and harmonization mechanisms of current programmers to ensure they match the root causes of vulnerability;
- Evaluate and, if necessary, improve the current IDPoor programme (the mechanism to identify poor households);
- Scale up coverage of **ongoing interventions** and improve efficiency and effectiveness;
- Pilot, evaluate and scale up new programmes based on effectiveness and sustainability to fill the gaps in existing social protection programmes.

To achieve this goal, the NSPS has the following objectives:

- The poor and vulnerable receive support, including food, sanitation, water and shelter, etc., to meet their basic needs in times of emergency and crisis.
- Poor and vulnerable children and mothers benefit from social safety nets to reduce poverty and food insecurity and enhance the development of human capital by improving nutrition, maternal and child health, promoting education and eliminating child labour, especially its worst forms.
- The working-age poor and vulnerable benefit from work opportunities to secure income, food and livelihoods, while contributing to the creation of sustainable physical and social infrastructure assets.
- The poor and vulnerable have effective access to affordable quality health care and financial protection in case of illness (NSPS for poor and vulnerable 2011-2015).
- Special vulnerable groups, including orphans, the elderly, single women with children, people with disabilities, people living with HIV, patients of TB and other chronic illness, etc., receive income, in-kind and psychosocial support and adequate social care.

The National Social Protection Strategy (NSPS) for the Poor and Vulnerable is thus expected

to play a critical role in reducing poverty and inequality. Following the policy directions outlined in the Rectangular Strategy for Growth, Employment, Equity and Efficiency Phase II, the RGC is advancing social protection for the formal sector while prioritizing expanding interventions aimed specially at reducing poverty, vulnerability and risks for the poor and vulnerable.

With regard to the medium term, the NSPS focuses on social protection for the poor and vulnerable. The poor and vulnerable are defined as:

- People living below the national poverty line; and
- People who cannot cope with shocks and/or have a high level of exposure to shocks (of these, people living under or near the poverty line tend to be most vulnerable).

The NSPS prioritises the development of effective and sustainable social safety nets targeted to the poor and vulnerable, with complementary social welfare services for special vulnerable groups, such as people living with HIV and orphans made vulnerable or affected by HIV.

The contributory intervention of community-based health insurance (CBHI) is also included, as it is targeted at the near poor who are vulnerable to falling into poverty as a result of health shocks. At the same time, the NSPS sets the framework for sustainable and comprehensive social protection for all Cambodians over the long term. This includes both contributory and non-contributory schemes.

The process of safety development in preparing the NSPS, the Council for Agricultural and Rural Development (CARD) in 2009 and 2010 convened meetings and held technical consultations with a broad set of national stakeholders, giving government representatives (national and sub-national), development partners, civil society representatives and other development practitioners the opportunity to explore the options and priorities in-depth. This transparent and rigorous consultation process has ensured that the analytical and policy inputs have gone through several rounds of discussion and are the result of a combined effort by all stakeholders.

By the results of this consultative process have been captured in NSPS Background Papers show that:

- **Safety Nets in Cambodia: Concept and Inventory, June 2009** (CARD, WFP and WB). This paper presents the main features, achievements, gaps and challenges faced by safety net programmes in Cambodia. It provides a review of basic concepts, a summary of risks and vulnerabilities, an inventory of existing safety nets and an analysis of the gaps between risks and vulnerabilities and existing safety nets.

- **Cash Transfer Programme to Support the Poor While Addressing Maternal and Child Malnutrition: A Discussion Note, March 2010** (WB, with contributions from CARD, GIZ, UNICEF, WFP and WHO). This output of the Technical Consultation profiles maternal and child malnutrition in Cambodia to assess the rationale behind investing in nutrition programmes. It gives a description of a possible cash transfer programme, as well as discussing and evaluation and costing and fiscal implications.

- **Background Note on a Public Works Programme as Part of Social Protection for the Poor and Vulnerable, March 2010** (CARD and ILO). This output of the Technical Consultation presents a vulnerability and needs analysis followed by an assessment of the rationale for investing in a public works programme (PWP), as well as an overview of approach and design issues.

- **Input on Tackling Child Labour and Increasing Educational Access, March 2010** (ILO, in consultation with UNESCO and UNICEF). This output of the Technical Consultation assesses social protection and its role in protecting vulnerable children, looking in particular at education and child labour and the linkages between them. With regard to the NSPS, it details incentives for families to ensure children attend school, services for vulnerable children (including those in the worst forms of child labour) and public works.

- Background Note: Cambodia – Towards a Social Protection Strategy for the Poor and Vulnerable, forthcoming (CARD and development partners). This background note presents the outcomes of the consultation process. It gives a detailed overview of poverty and vulnerability in Cambodia, of safety nets already in place and of policy challenges, in order to generate some conclusions on a social protection strategy for the poor and vulnerable, its objectives and options for the near future.

By rectangular Strategy Phase II and National Strategic Development Plan Update 2009-2013

The RGC's Rectangular Strategy sets the broad policy directions for improving social protection and identifies priorities for the development of social safety nets. It promotes sustainable and equitable development and prioritises improvements in social protection provision. Through social safety nets, the RGC intends to increase social sector interventions, thereby Enhancing emergency assistance to victims of natural disasters and calamities; Reducing vulnerabilities of the poor; Reducing disparities in maternal and child health outcomes and inequities in health service utilization and access to care between richest and poorest quintiles; To preventing and withdrawing children from child labour, especially its worst forms; Enhancing access to and quality of children's education; Improving employment opportunities; Enhancing provision of fee exemptions, health equity funds (HEFs)⁴ and subsidy schemes to ensure affordable access to health services; and Expanding rehabilitation programmes for the disabled, as well as welfare programmes for the elderly, orphans, female victims of abuse and rights violations, people living with HIV and tuberculosis (TB), the homeless and veterans and their families.

The **NSDP Update 2009-2013** further specifies the need to streamline social protection. In guiding the development of the NSPS and priorities over the short to medium term, it highlights the need to:

- Give preference to social protection measures that not only provide immediate relief but also contribute to building the beneficiary population's ability/capacity to contribute to the social and economic development of their community;
- Ensure greater transparency and better targeting in the delivery of social protection for the poor through the use of the Identification of Poor Households programme (IDPoor)⁵, and through another appropriately adapted targeting mechanism for the urban poor while IDPoor is being adjusted to urban areas;
- Minimize the planning and delivery costs (overheads) of social safety net programmes to achieve a maximum net transfer of resources to beneficiary populations; and
- Ensure cross-sectoral coordination and integration of social protection measures with decentralised development planning.

International Commitments : The RGC is signatory to a number of international conventions which provide a legal framework for the realization of the right to social protection and the reinforcement of the scope of social protection provision to citizens. These include, among others:

- The Universal Declaration of Human Rights;
- The United Nations Convention on the Rights of the Child;
- The Convention on the Elimination of All Forms of Discrimination against Women;
- The International Covenant on Economic, Social and Cultural Rights;
- The Convention on the Rights of Persons with Disabilities; and
- The Madrid International Plan of Action on Ageing.

The RGC has also ratified all International Labor Organization (ILO) core labor standards and conventions, including Convention No. 138 on the Minimum Age for Admission to Employment and Convention No. 182 on the Elimination of the Worst Forms of Child Labor.

3- Defining food security and nutrition

Many studies have shown that eating habits are established early in the life cycle and tend to carry through to adulthood. Healthy eating habits developed early in life will encourage healthy eating as an adult. Nutrition, nourishment, or aliment, is the supply of materials - food - required by organisms and cells to stay alive. In science and human medicine, nutrition is the science or practice of consuming and utilizing foods.

Meanwhile, **Food security** refers to a household's physical and economic access to sufficient, safe, and nutritious food that fulfills the dietary needs and food preferences of that household for living an active and healthy life. The World Health Organization defines food security as having three facets: food availability, food access, and food use. Food availability is having available sufficient quantities of food on a consistent basis. Food access is having sufficient resources, both economic and physical, to obtain appropriate foods for a nutritious diet. Food use is the appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation. The FAO adds a fourth facet: the stability of the first three dimensions of food security over time.

Two commonly used definitions of food security come from the UN's Food and Agriculture Organization (FAO) and the United States Department of Agriculture (USDA): Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

Food security for a household means access by all members at all times to enough food for an active, healthy life. Food security includes at a minimum (1) the ready availability of nutritionally adequate and safe foods, and (2) an assured ability to acquire acceptable foods in socially acceptable ways (that is, without resorting to emergency food supplies, scavenging, stealing, or other coping strategies). (USDA).

3-1 Definition of Nutrition

What is nutrition? Why nutrition is importance? There are six major classes of nutrients: carbohydrates 1-Fats 2-Minerals 3-Protein 4-Vitamins 5-Water.

These nutrient classes can be categorized as either macronutrients (needed in relatively large amounts) or micronutrients (needed in smaller quantities). The macronutrients include carbohydrates (including fiber), fats, protein, and water. The micronutrients are minerals and vitamins.

The macronutrients (excluding fiber and water) provide structural material (amino acids from which proteins are built, and lipids from which cell membranes and some signaling molecules are built) and energy. Some of the structural material can be used to generate energy internally, and in either case it is measured in Joules or kilocalories (often called "Calories" and written with a capital C to distinguish them from little 'c' calories). Carbohydrates and proteins provide 17 kJ (4 kcal) of energy per gram, while fats provide 37 kJ (9 kcal) per gram. Though the net energy from either depends on such factors as absorption and digestive effort, which vary substantially from instance to instance. Vitamins, minerals, fiber, and water do not provide energy, but are required for other reasons. A third class of dietary material, fiber (i.e., non-digestible material such as cellulose), is also required, for both mechanical and biochemical reasons, although the exact reasons remain unclear.

Molecules of carbohydrates and fats consist of carbon, hydrogen, and oxygen atoms. Carbohydrates range from simple monosaccharide (glucose, fructose, galactic) to complex polysaccharides (starch). Fats are triglycerides, made of assorted fatty acid monomers bound to glycerol backbone. Some fatty acids, but not all, are essential in the diet: they cannot be synthesized in the body. Protein molecules contain nitrogen atoms in addition to carbon, oxygen, and hydrogen. The fundamental components of protein are nitrogen-containing amino acids, some of which are essential in the sense that humans cannot make them internally. Some of the amino acids are convertible (with the expenditure of energy) to glucose and can be used for energy production just as ordinary glucose in a process known as gluconeogenesis. By breaking down existing protein, some glucose can be produced internally; the remaining amino acids are discarded, primarily as urea in urine. This occurs normally only during prolonged starvation. Other micronutrients include antioxidants and photochemical, which are said to influence (or protect) some body systems. Their necessity is not as well established as in the case of, for instance, vitamins.

Most foods contain a mix of some or all of the nutrient classes, together with other substances, such as toxins of various sorts. Some nutrients can be stored internally (e.g., the fat soluble vitamins), while others are required more or less continuously. Poor health can be caused by a lack of required nutrients or, in extreme cases, too much of a required nutrient. For example, both salt and water (both absolutely required) will cause illness or even death in excessive amounts. (**See figure 1**).

3-2 Conceptual frameworks of malnutrition

According to this framework, developed by UNICEF, malnutrition occurs when dietary intake is inadequate and health is unsatisfactory, being the two immediate causes of malnutrition. In developing countries, infectious diseases, such as diarrhoea diseases (DD) and acute respiratory diseases (ARI), are responsible for most nutrition-related health problems.

Readily available food, appropriate health systems and a "healthy" environment are ineffective unless these resources are used effectively. As a result, the absence of proper care in households and communities is the third necessary element of the underlying causes of malnutrition.

Finally, this conceptual framework recognizes that human and environmental resources, economic systems and political and ideological factors are basic causes that contribute to malnutrition.

This model relates the causal factors for under-nutrition with different social-organizational levels. The **immediate** causes affect individuals, the **underlying** causes relate to families, and the basic causes are related to the community and the nation. As a result, the more indirect are the causes, the wider the population whose nutritional status is affected.

The Food Security and the Malnutrition conceptual frameworks, which are the most commonly used frameworks used in this field, show significant differences. The food security framework emphasizes an **economic approach** in which food as a commodity is a central focus. The malnutrition framework adopts a **biological approach** in which the human being is the starting point. However, both frameworks have in common the promotion of an inter-disciplinary approach to ensuring food and nutrition security. **(See figure 2)**

3-3 Defining Food Security

Most organizations interviewed for this study are using the 2002 World Food Summit definition of food security: Food security is said to exist 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.

As for Food and Agriculture organization said that "Food security exists when all people at all times have physical or economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996). FAO reaffirmed this view in its first published assessment of the implications of climate change for food security, contained in its 2015 to 2030 projections for world agriculture.

This definition recognizes the key food security concepts of food availability, access, stability and utilization. It is widely recognized that food insecurity occurs in two different time dimensions.

3-4 The Causes of Food Insecurity

Malnutrition and more broadly food insecurity are caused by a complex interaction of factors.

The concept of food security identifies four causal dimensions of food insecurity (availability, access, use/utilization and stability) to help unravel this complexity (1).

(See figure 3)

❖ Causal Dimensions of Food Insecurity

1. Food Availability

People lack the ability to directly produce sufficient food to meet their Nutritional needs through their own efforts in agricultural production and through gathering from Common Property Resources (CPRs) including forests and fisheries.

2. Food Access:

People have insufficient cash income to purchase sufficient food through the Market. Markets themselves may lack infrastructure, services and capital to provide a sufficient stock to meet minimum food requirements. As well, there are insufficient social transfers or safety nets for people unable to produce or purchase their food needs.

3. Food Use and Utilization

People may encounter problems in using and utilizing food for adequate nutrition. Pregnant

and lactating mothers may themselves be malnourished, limiting the nutrition available to their infants. Mother-child care practices may not be appropriate for child health and nutrition. A high incidence of infections such as acute respiratory infection and diarrhea and a lack of maternal and child health services will reduce mother and child health and nutrition. A lack of access to safe drinking water and hygienic sanitation will increase illness and infection rates and decrease health and nutritional status.

4. Stability

People need an adequate supply of nutritious food and clean water daily to provide adequate nutrition and food security. Instability in the regular supply of sufficient food and clean are causes malnutrition and food insecurity. Causes of instability can include flood and drought impacts on agriculture, environmental degradation or changes in access to CPRs, shifts in purchasing power for market foods, and political instability including wars and conflict. Some communities may be experiencing acute instability at one point in time and a broader range of communities may become more vulnerable to the impacts of instability in the future.

This section provides an overview of the causal dimensions of food insecurity in Cambodia. Further descriptions of these dimensions are found in the sector situation analyses specific to each of the FSN objectives in Section 3.

3-5 Food Security conceptual frameworks

There are various conceptual frame works and models that show and identify and link the dimensions and determinants of food security. A food security conceptual

framework is illustrated in order to provide a common understanding of the many factors effective food security at difference levels (**see figure4**).

This global accepted comprehensive food security framework was developed by the multi-agency FIVIMS initiative. It should be modified based on in-depth discussions with concerned agencies to better reflect the many factors and dimensions of food security

in Cambodia , and to identify appropriate food security indicators at different levels, to guide food security information efforts.

This framework clearly illustrates food security conditions and determinates at different

levels of the society: national, sub-national, community, household and individual levels. It illustrates, defines indicators and identifies linkages among the four dimensions of food security: availability, access, stability and utilization. It provides valuable insight into the types of information that could be included in a comprehensive food security information system.

3-6 Food security in Cambodia analysis base on four key of food security

- **Food Availability**

Over 80 percent of the Cambodian population lives in rural areas and these people typically produce at least part of their food needs. An important achievement over recent years is that

Cambodia has become self-sufficient in rice production and is now able to meet the minimum staple food needs of the population overall (2). However, at the sub-national level, rice balances are uneven among different geographical areas and socio-economic groups. Yields of paddy rice increased from an average of 1, 31 tons/ha in 1993 to 2.49 tons/ha in 2006-2007, which is still substantially below the yields reached in neighboring countries³⁰. Limited data exist on the production of other crops and livestock products necessary for an adequate diet, but there are also large variations in the intake of these other food groups, as indicated by the variable prevalence of protein-energy and micronutrient malnutrition discussed in *The FSN Situation in Cambodia - Progress and Trends, Malnutrition and Mortality and Overview of the Causes of Food Insecurity.*

It is recognized that rural Cambodians, especially small hold and landless farmers, face a wide range of constraints in their efforts to produce food from crop agriculture, livestock-raising, and the harvest of forestry and fisheries. In terms of crop agriculture, major constraints include small farm sizes, high dependency on rain-fed production, rising rates of landlessness, low crop yields, high production risks, the cost of credit and a lack of crop diversification. Livestock production is limited by high livestock mortality and morbidity rates and the small number owned by each household (3).

Common Property Resources (CPRs) such as forests, fisheries and commons agricultural areas are also an important food resource for Cambodian people, especially the rural poor(4).

Food availability from CPRs is limited by a number of factors, including degradation through (largely) commercial exploitation, and enclosure of areas by private interests, which limits access to CPRs and presents challenges for sustainable Common Property Resources management(5).

- **Food Access**

Rural Cambodians typically are food producers engaged in agriculture. However, they are also highly dependent on buying some types of food, including rice, for some period every year. Many can produce only part of their basic food needs, and food security for them is therefore very much a matter of whether they can purchase the foods they need on the market. Purchasing power to buy food on the market is limited in Cambodia and many poor

rural households lack productive assets (such as land and livestock) to generate cash income. In all, 35 percent of households live below the consumption poverty line and 20 percent under the food poverty line (6). Rapidly increasing food prices are likely to further limit the capacity of food-insecure households to buy sufficient food that may lead to a switch to foods that have lower nutritional value and lack important micronutrients or other negative coping strategies.

Sources of income are often erratic and limited to insecure and unsafe economic activities within the informal sector of the economy (7). Market systems in Cambodia, including markets for food, require further development of infrastructure, services and capital to provide an improved access to foods at the local level.

- **Food Use and Utilization**

Inappropriate use and utilization of food contributes significantly to the overall malnutrition

in Cambodia. Causal factors here are poor nutrition knowledge and practices, insufficient access to maternal care services, inappropriate mother-child care practices, and high prevalence of child illnesses including diarrhea and respiratory infections, and child micronutrient malnutrition. The poor have insufficient access to affordable good quality health care due to high costs and a lack of services. Expenditure on care among the poor for serious health conditions has been shown to lead to indebtedness and asset disposal, resulting in further impoverishment and chronic food insecurity(8). A further important underlying cause of child illnesses in Cambodia is the insufficient access of rural households to sanitation (16 percent) and to safe drinking water (42 percent).

- **Stability**

A final set of causes of food insecurity are found in the vulnerability of Cambodian rural people to shocks and stresses that can reduce their food supply, access to food or food utilization to below-minimum needs. Agro-ecological vulnerabilities include high risks of flood or drought damaging crop production. Socio-economic vulnerabilities include dependency on low, erratic and insecure sources of cash income, illiteracy and a lack of education, and a broad range of factors related to security and human rights(9).

Vulnerable groups in Cambodia are unable to produce or purchase their food needs either temporarily (e.g. due to flood or drought impacts) or permanently (e.g. the aged living alone, orphans, those living with chronic illnesses such as HIV/AIDS, the destitute, and the under-employed). Another non-market-based dimension of stability of food access is the inadequate provision of social transfers or safety nets to provide food and other basic needs to such vulnerable groups. While some important programmers are active in this area, further development of disaster risk reduction and social safety nets is required to meet the needs of these vulnerable groups in society.

Section 3: Mechanisms and Institutions (Programs and activities on food and nutrition security)

3-1 Food Economy of Cambodia

Food should be considering in terms of the variety needs to support the dietary and nutrition needs of people. Cereals of starch, pluses, fish and meat for protein, vegetable and fruits for minerals and vitamin and essential fats from edible oil, mainly vegetable oils are the main items for food. With the exception of rice, which is importance Cambodia is able to product enough food to meet the basic requirements of its population. Rice, pluses and fishery products are major export commodities.

❖ In 2004, 34.7 percent of Cambodians were below the poverty line and 90 percent of these poor were located in rural areas. Nationally, 23 percent of the Cambodian population, or 3 million people, were food-deprived in 2003-2004, consuming less than the minimum daily energy requirement of 1715kcal/day.

❖ In 2005, more than 630,000 or 37 percent of Cambodian children aged under five were suffering chronic malnutrition (stunting) and 7 percent of children were acutely malnourished (wasted).

3-2 Food security related to policies and activities

As a strategic frame work for food security and nutrition of 2008-2012, the government of Cambodia recognized food security and nutrition (FSN) is an important development priority of the Royal Government of Cambodia (RGC) and is essential for achieving the Cambodian Millennium Development Goals (CMDGs). Food security is addressed directly in CMDG 1, "Eradicate extreme poverty and hunger", but FSN is also crucial to achieving most of the other CMDGs.

On the other hands, as the National Strategic Development Plan (NSDP) 2006-2010 states that food security and nutrition is a key goal which is "to ensure that poor and food insecure Cambodians, by 2010, have substantially improved physical and economic access to sufficient, safe and nutritious food at all times to meet their dietary needs and food preferences for an active and healthy life". Food security is further recognized as a basic human right under the Universal Declaration on Human Rights and the International Covenant on Economic, Social and Cultural Rights, which have been ratified by Cambodia.

In 2008, the Royal Government of Cambodia (RGC) through the National Council for Nutrition chaired by MoP will also develop a new Cambodian Nutrition Investment Plan (CNIP 2008-2012) to further operationalise some of the priority actions outlined in this document. Significant progress in improving FSN in Cambodia has been achieved in the recent past, but much remains to be done to ensure food security and to eliminate malnutrition in Cambodia. The SFFSN will help to guide the efforts of the RGC and the development partners in this regard.

The SFFSN 2008-2012 consists of a Vision, a Goal and five Objectives. **The SFFSN long-**

term Vision is the achievement of food security and adequate nutrition for the people of Cambodia. This Vision is consistent with the globally agreed Millennium Development Goals (MDGs) and the Cambodia Millennium Development Goals (CMDGs)

and can be formulated as follows:

Vision of strategic on food and nutrition security: All Cambodians have physical and economic access to sufficient, safe, and nutritious food, at all times, to meet their dietary needs and food preferences for an active and healthy life.”

Goal of strategic on food and nutrition security: The SFFSN Goal is therefore “By 2012, poor and food-insecure Cambodians have substantially improved physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life.”

Objectives for 2008-2012

The SFFSN 2008-2012 has five Objectives. Each has defined areas for interventions and a range of Priority Actions to be implemented. Each will require investment in services and infrastructure and the development of capacities in various sectors by a number of government ministries and coordination bodies.

Objective 1: Food-insecure households **increase food availability** from their own agriculture and livestock production and from common property forests and fisheries.

Objective 2: Food-insecure households **increase their food access** by increasing household income.

Objective 3: Food-insecure households **improve the use and utilization of their food** resulting in reduced malnutrition, morbidity and mortality, particularly among women and children.

Objective 4: Improved social safety nets and enhanced capacities of food insecure households to cope with risks and shocks **increase the stability of their food supply.**

Objective 5: The **institutional and policy environment** for achieving improved food security and nutrition in Cambodia is **enhanced**.

Each FSN objectives will require the funding and implementation of a range of priority actions requiring service and infrastructure investments over a range of sectors by a number of government ministries and coordination bodies. These government ministries and coordination bodies will also require development of their institutional capacities.

Objective of FNS	Activities	Focus on
1-Food-insecure households increase food availability from their own agriculture and livestock production and from common property forests and fisheries.	<ol style="list-style-type: none"> 1. to improving the productivity and diversification of agriculture. 2. to improving the management of water resources and Irrigation. 3. Enhancing fisheries reforms. 4. Enhancing forestry reforms. 	<ul style="list-style-type: none"> - Enhancing productivity and diversification of agriculture, land reform and the clearing of mines. - Management of water resources and irrigation. - Fisheries reform. - Forestry reform.
2-Food-insecure households increase their food access by increasing household income.	<ol style="list-style-type: none"> 1. Increasing wage employment opportunities for the poor and food-insecure. 2. Increasing micro-enterprise opportunities for the poor and food-insecure. 3. Developing market infrastructure and services. 4. Developing transport infrastructure and services. 	<ul style="list-style-type: none"> - Increasing wage employment opportunities for the poor and food-insecure. - Increasing micro-enterprise opportunities for the poor and food-insecure. - Developing market infrastructure and services. - Developing transport infrastructure and services.
3- Food-insecure households improve their utilization of food resulting in reduced malnutrition, morbidity and mortality, particularly among women and children	<ol style="list-style-type: none"> 1. Reducing child and maternal malnutrition and mortality. 2. Improving domestic water supply and sanitation and hygiene practices. 3. Improving food safety and enhancing food fortification. 	<ul style="list-style-type: none"> - Reducing child and maternal malnutrition and mortality. - Improving domestic water supply and sanitation and hygiene practices. - Improving food safety and enhancing food fortification.
4- Improved social safety nets and enhanced capacities of food insecure	<ol style="list-style-type: none"> 1. Strengthening disaster management safety nets. 2. Establishing social safety nets for vulnerable groups. 	<ul style="list-style-type: none"> - Improving disaster management safety nets. - Improving vulnerable group social safety nets.

<p>households to cope with risks and shocks increase the stability of their food supply.</p>		
<p>5- The institutional and policy environment for achieving improved food security and nutrition in Cambodia is enhanced.</p>	<ol style="list-style-type: none"> 1. Strengthening capacities and improving coordination for FSN. 2. Integration of FSN into the decentralized local planning process. 3. Improved FSN-related information management and targeting of interventions. 	<ul style="list-style-type: none"> - Capacity-building and improved coordination for FSN. - Improving integration of FSN into the decentralized local planning process. - Improved FSN-related information management for better targeting of FSN Interventions to assist the poor and food-insecure at the national and community levels.

For each objective, succinct, sector-specific situation analyses of the causes of malnutrition and food insecurity are included as a rationale for discrete actions to improve the FSN of the Cambodian people. They are adapted from the 2005 FSN Strategy Paper developed with the membership of the TWG-FSN and submitted as an NSDP input to the MoP.