Towards a Food Secure Bangladesh:

Country Programming Framework 2010-2015

Former National Medium Term Priority Framework

Jointly prepared by
The Ministry of Agriculture,
Government of Peoples Republic of Bangladesh

and

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ACRONYMS

ADB	Asian Development Bank
AI	Artificial Insemination
AI Unit	Avian Influenza Unit
AUSAID	Australian Government Overseas Aid Programme
BADC	Bangladesh Agricultural Development Corporation
BARC	Bangladesh Agricultural Research Council
BARI	Bangladesh Agriculture Research Institute
BBS	Bangladesh Bureau of Statistics
BCIC	Bangladesh Chemical Industries Corporation
BDT	Bangladesh Taka
BWDB	Bangladesh Water Development Board
CDIL	Central Disease Investigation Laboratory
CEGIS	Centre for Environment and Geographic Information System
CIP	Country Investment Plan (Bangladesh)
CPF	Country Programming Framework
CSO	Civil Society Organization
DAE	Department of Agricultural Extension
DANIDA	Danish International Development Agency
DEA	Decentralized Extension Approach
DFID	UK Department for International Development
DLS	Department of Livestock Services
DoF	Department of Fisheries
DPHE	Department of Public Health
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DTWs	Deep Tubewells
DVH	District Veterinary Hospitals
EC	European Commission – Delegation in Bangladesh
ECS	Extension Coverage Survey
ESP	Extension Service Providers
FAO	Food and Agriculture Organization
FMTW	Force Mode Tube Well
GDP	Gross Domestic Product
GOB	Government of Bangladesh
HKI	Hellen Keller International (INGO)
HIES	Household Income Expenditure Survey
HTWs	Hand Tubewells
HYVs	High Yielding Varieties
ICT	Information and Communication Technology
ICM	Integrated Crop Management
IDA	International Development Association
INGO	International NGO
IPM	Integrated Pest Management
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
KCal	Kilo Calories
LCG	Local Consultative Group
LLP	Low Lift Pumps

MAEP	Mymensingh Aquaculture Extension project
MDG	Millennium Development Goal
MoA	Ministry of Agriculture
MoEF	Ministry of Environment and Forests
MoFDM	Ministry of Food and Disaster Management
MoFL	Ministry of Fisheries and Livestock
MOP	Muriate of Potash
MoP	Ministry of Planning
MOUs	Memorandum of Understanding
MT	Metric Tons
O&M	Operation and Maintenance
NARS	National Agriculture Research System
NFP	National Food Policy
NGO	Non Governmental Organization
NIB	National Institute of Biotechnology
NIC	National Implementation Committee for CPF
NMTPF	National Medium Term Priority Framework (previous name of CPF)
NSAPR-II	National Strategy for Accelerated Poverty Reduction
POA	Plan of Action of the National Food Policy
PPP	Public Private Partnership
PRSP-I	Poverty Reduction Strategy Paper
R FDIL	Regional Field Diseases Investigation Laboratories
RAP	FAO Regional Office for Asia and the Pacific
R&D	Research and Development
SAARC	South Asian Association for Regional Cooperation
SME	Small and Medium Enterprise
SO	FAO Strategic Objectives
SOFI	State of Food Insecurity
SLDP	Smallholder Livestock Development Project
SRDI	Soil Resources Development Institute
STWs	Shallow Tube Wells
T. Aman	Transplanted Aman
TLS	Truthful Labelled Seed
UN	United Nations
UNCDF	United Nations Capital Development Fund
UNCT	United Nations Country Team
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNFPA	United Nations Populations Fund
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
WB	World Bank
WFP	World Food Programme of the UN
WFS	World Food Summit

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Towards a Food Secure Bangladesh:

Country Programming Framework of Bangladesh (2010-2015)

1. Introduction

1.1 Background and context

The GoB-FAO Country Programming Framework (CPF) – Towards a Food Secure Bangladesh, formerly known as National Medium-Term Priority Framework (NMTPF), is a strategic planning and management tool. The CPF Bangladesh is meant to provide FAO with a sound basis for a mid-term country programme, compliant with the policies and priorities of the Government, aiming to enhance the coordination among donors and other UN agencies. The specific objectives of CPF are to improve effectiveness of FAO's response at country level, identify national priorities in line with that of the government, better program coordination at the FAO Representation, effective contribution to MDGs, and effective contribution to UNDAF/UNCT in the area of agriculture and food security. It identifies the medium-term priorities of GOB and FAO for the period of 2010-2015 for FAO's and Development Partners' technical cooperation in Bangladesh. It prioritises areas in which FAO will focus its assistance in an effective and coherent manner to support the implementation of the Government's priorities.

1.2 Process of formulation

The process of Country Programming Framework (CPF) started with formulation of an interministerial committee headed by Secretary of Ministry of Agriculture (MOA). The ministries involved in the process are MOA, Ministry of Fisheries and Livestock (MOFL), Ministry of Food and Disaster Management (MOFDM), Ministry of Environment and Forest (MOEF), and Ministry of Planning (MOP). The committee has provided strategic guidance and reviewed the progress of CPF formulation. FAO supported the formulation with national and international expertise to identify FAO's strategic niche and competitive edge in the national policies, strategies and priority actions in agriculture.

FAO worked in synergy and complementary with the GOB planning process which includes review and determining intervention areas from PRSP-I, NSAPR-II, Medium Term Budget Framework (MTBF), GOB Perspective Plan 2010-2021(draft), concept note of GOB Sixth Five-Year Plan 2011-2015 (through consultation with Planning Commission), Agricultural Sector Review 2006 (GoB/FAO, 2006), National Food Policy Plan of Action (2008-2015), Animal Health- National Medium Term Priority Plan (NMTPP, 2011-15), the UNDAF (United Nations Development Assistance Framework) and the

National Millennium Development Goals and other priorities of the UN Country Team (UNCT) and of the Development Partners (Fig. 1).

Figure 1. Synergizing different GoB policies and planning processes

The formulation of CPF main document is facilitated with the background work of selected 11 sectors studies, reviewing the current performance of the sectors, challenges, and their future potential according to the respective GoB policies and priorities. Eleven authors prepared background sector reports. The sectors are: (i) Crop production, (ii) Fisheries and aquaculture, (iii) Livestock, (iv) Forestry, (v) Seed sector, (vi) Irrigation and water management, (vii) Knowledge generation and management, (viii) Agribusiness, (ix) Natural Resource management, (x) Agricultural Extension and Technology management and (xi) Fertilizer management. Food Security, Gender Equality, Climate Change Adaptation and Mitigation have been addressed as cross-cutting issues in all the sector studies.

The sector studies and the priorities by sector have been peer reviewed and shared with relevant GoB agencies in a consultative workshop. RAPP and relevant technical divisions in FAO HQ also provided inputs for fine tuning of sector papers and main CPF document. The draft CPF was presented to the Planning Commission for their review and inputs.

1.3 Report structure

The report is organized into four sections. Section I introduces the CPF while section II provides a detailed narration of the current situation of agriculture and food security. Section III discusses the proposed priority areas and the final section discusses how the priorities are planned to be implemented, monitored and performance is evaluated.

2. Current Situation of Agriculture and Food Security

The present section gives a brief insights into macroeconomic perspective, overview of agriculture sector, food security situation, current issues and challenges that need to be addressed.

2.1 Macroeconomic perspective

Despite the losses caused by the two consecutive floods and the cyclone 'Sidr' in 2007 and also the adverse effects arising from unprecedented price hike of crude oil in international market and agricultural inputs, the GDP growth over the last five years grew consistently at an average rate above 6 percent. The growth of import-export trade, secular increasing trend in the flow of remittance and the favourable balance of the current account kept the external sector to some extent stable.

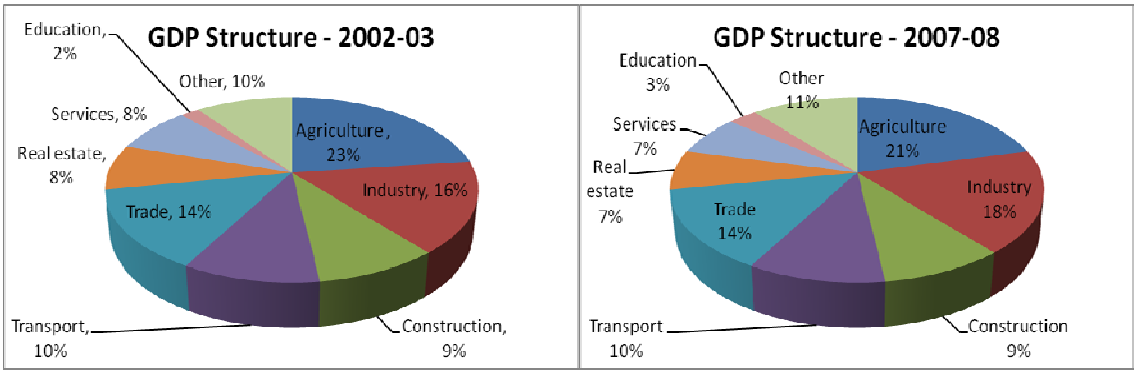

Fig. 2 Recent changes in structure of GDP

During the recent decade overall GDP of Bangladesh has been considerably shown upward trend. But the growth in agriculture GDP slightly declined with an average of 3.4% during 1997 to 2008. Agriculture being the supportive of growth of the economy, there is no other alternative but to develop agriculture sector for alleviation of poverty by attaining accelerated economic growth. Since provision of food security, improvement of the living standard and generation of employment opportunities of the huge population of the country are directly linked to the development of agriculture, there have been continued efforts by the Government for the overall development of this sector.

2.2 Sectoral overview of agriculture

Agriculture is the most important sector of Bangladesh economy due to its role in food security, employment and livelihood. The current share of agriculture to GDP is around 21%, although this share has been declining in the last ten years along with the one of the agricultural sub sectors' (Table 1). Still more than 70% of the people in Bangladesh are directly or indirectly employed in this sector.

The agriculture of Bangladesh is dominated by crops which accounts about half of total agricultural GDP Fisheries & livestock are also important sub-sector contributing to agricultural GDP (Table 1). It is important to note that in the recent decade the subsector of livestock, forestry and fisheries had faster growth rate (Table 2). There are, however, substantial year to year fluctuations in these rates and it is most pronounced in case of crops.

Table 1.Contribution of agriculture to GDP (%) at constant prices (Base: 1995-96=100)

Sector/ Sub-Sector	Year								
	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Agriculture	25.58	25.03	23.99	23.47	23.08	22.28	21.85	21.37	20.88
A. Crops	14.59	14.7	13.75	13.43	13.23	12.51	12.28	12	11.7
B. Livestock	3.02	2.95	2.96	2.93	2.91	2.95	2.92	2.88	2.79
C. Forestry	1.88	1.87	1.88	1.86	1.83	1.82	1.79	1.76	1.75
D. Fishing	6.09	5.51	5.4	5.25	5.11	5	4.86	4.73	4.64

Source: Statistical Yearbook of Bangladesh 2007

Table 2.Growth rate of agriculture and its sub-sectors at constant price (Base: 1995-96=100)

Sector/ Sub-Sector	Year								
	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
GDP growth rate	5.94	5.27	4.42	5.26	6.27	5.96	6.63	6.43	6.21
Agriculture	6.16	4.59	2.36	3.54	4.13	4.03	5.07	4.81	3.85
A. Crops	8.10	6.18	-2.39	2.88	4.27	0.15	5.03	4.43	3.44
B. Livestock	2.74	2.81	4.70	4.51	4.98	7.23	6.15	5.49	2.41
C. Forestry	4.94	4.85	4.91	4.43	4.18	5.09	5.18	5.24	5.42
D. Fishing	8.87	4.53	2.22	2.33	3.09	3.65	3.91	4.07	4.11

Source: Statistical Yearbook of Bangladesh 2007 & Statistical Pocket Book 2008

Rice dominates Bangladesh agriculture covering more than 80% of the land area. The production of main staple rice has shown a long term growth trend of 2.8 percent per annum over the period from 1981/82 to 2006/07. During 1997 to 2005, total rice acreage changed little, T. Aman acreage remained almost unchanged, while irrigated Boro acreage substantially increased with the reduction of rain-fed Aus which showed about 6.3 percent annual growth during the same period. Boro rice accounts for about 60 percent of total food grain production (Figure 3 and 4).

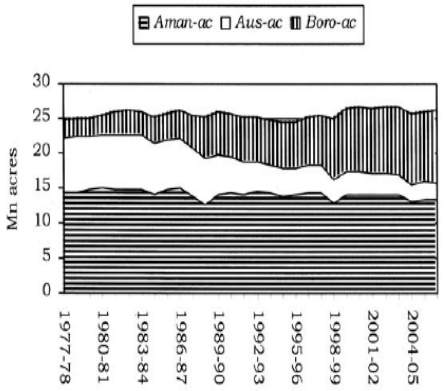

Figure 3. Rice acreage by season

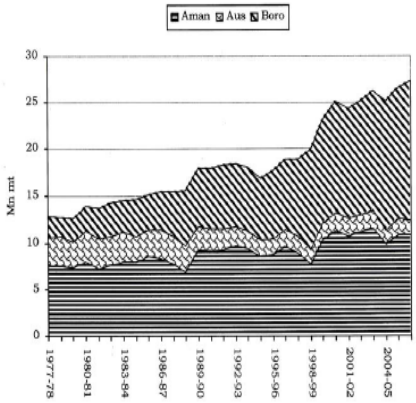

Figure 4. Rice output by season

During the same period production of potato and vegetables also increased considerably (Fig 5). For other crops long term growth remains unsatisfactory. Usually little land is used to grow nutritionally important food crops such as vegetables, fruits, pulses and oilseeds (Table 3). During recent years both production and area of wheat, pulses and oilseeds have been greatly reduced.

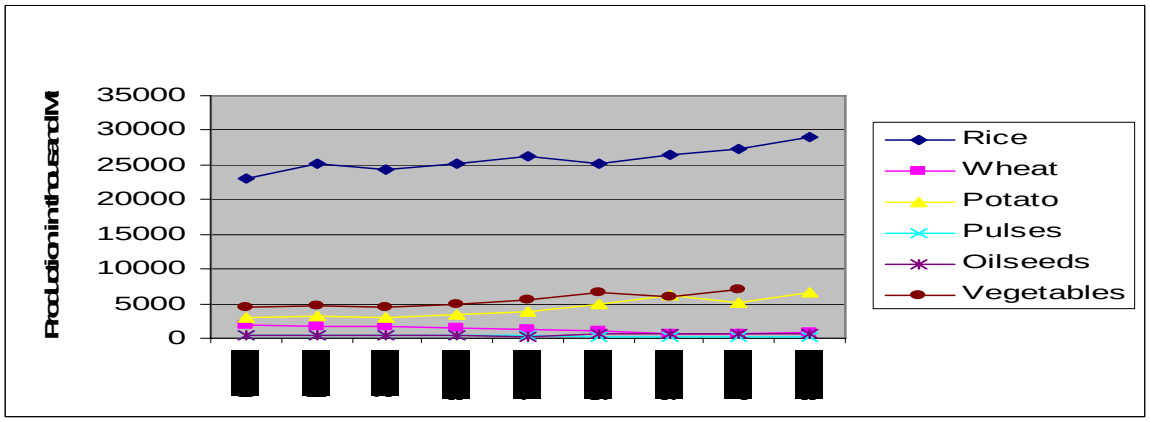

Fig. 5 Trend in production of rice and non-rice crops

Table 3 Percentage of land area planted to different crops in 2004-05

	Land area percentage
Rice	79.4
Wheat	4.09
Pulses	>2.80
Oilseeds	>2.37
Potato	>2.39
Jute	>2.86
Fruits	>1.36
Sugar cane	>1.15
Tea	>0.39
Spices and condiments	>2.21
Vegetable	>2.14

During recent years both production and area of wheat, oilseed and pulses have greatly reduced. The growth of pulses was only 0.3% while sugar was negative 1.2% other than rice and potatoes all other crops showed the decline in growth rate (Table 4).

Table 4 Growth of non rice crops in Bangladesh during 1971 to 2007

Food Items	Percent/Year (1971-2007)
Wheat	-2.9
Pulses	0.3
Oil crops	2.3
Potatoes	3.0
Vegetables	1.5
Sugar	-1.2
Fish	2.5
Meat	2.3
Milk	2.3
Egg	4.0

The preceding section describes the contribution of principal drivers in crop sector growth:

Irrigation

The recent agricultural growth in the country has been largely due to expansion of minor irrigation through the use of Deep Tubewells (DTWs), Shallow Tubewells (STWs) and Low Lift Pumps (LLPs) (Figure 6). During 2006, there were 29,170 DTWs, 12,02,720 STWs and 1,07,290 LLPs fielded and the total irrigated area was estimated at 4.883 M ha which was 56.51% of the net cultivable area of the

country; where irrigation coverage by groundwater and surface were 80.6% and 19.4%, respectively. Again, in 2007 the national irrigation coverage was 5.05 million hectares which is 60.92% of the total cultivable land, where groundwater covered 78.98% and surface water covered 21.02% of the total irrigated area (MoA, 2008).

Fertilizer use

Fertilizer use in Bangladesh has increased from 3.28 million tons in 2001-02 to 3.55 million tons in 2006-07 (Figure 4). During 2002 to 2009 the growth rate of total fertilizer use in Bangladesh was 4.2% per annum. Between 2002 and 2009, the demand for fertilizer in Bangladesh has increased by 25%. Fertilizer prices in Bangladesh have risen very sharply during 2008. The cost of Triple Super Phosphate (TSP) and Muriate of Potash (MOP) rose from BDT 16 in 2007 to BDT 50 and BDT 40 per kg, respectively while the cost of urea was maintained at BDT 6 per kg by a government subsidy,

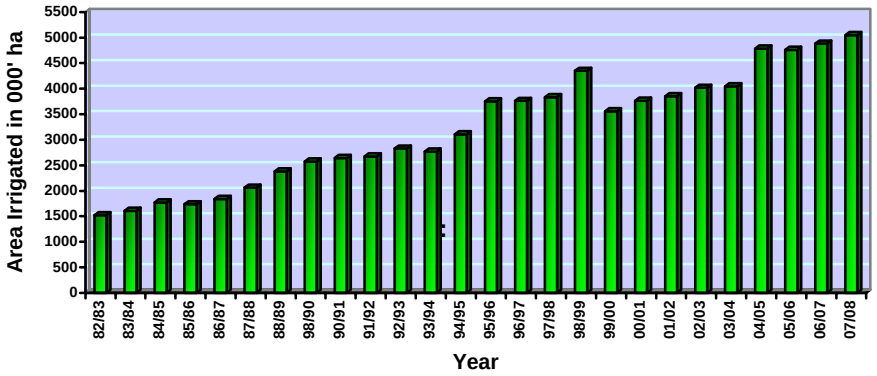

Fig.6 Yearly Trend in Irrigated Land Area in Bangladesh

reduced greatly by government. It is however noted that very recently the government has increased price urea to Tk 12 per kg and the prices of MOP and TSP have been largely reduced through government intervention. In the fiscal year 2010-11, government has decided to support 1.82 crore farmer families under the agro-input Assistance-Card for purchasing diesel, fertilizers, seeds and receiving credit.

Supply of Quality Seeds

A number of agencies, both public and private are presently involved in seed production and distribution system of the country. The fact is that only about 18% seed requirements of the country can be met from certified and Truthfully Labelled Seeds (TLS) of Government and private sources, the remaining 82% seed comes from the farmers own seed. There are serious problems of seed quality supplied by public, private and farmer's saved seed.

Livestock

In 2006-07, total cattle population of the country was about 23 million, buffaloes 1.21 million, goat and sheep 23 million and poultry and duck 246 million. The production of milk, meat (beef, mutton and chicken) and eggs had an increasing trend over the past several years (Fig 7 and 8). However, its total production is still far below the national requirements. The milk production showed slow growth but sustained growth while recently meat production is slightly decreasing. On the other hand, the egg production largely fluctuates due to avian influenza.

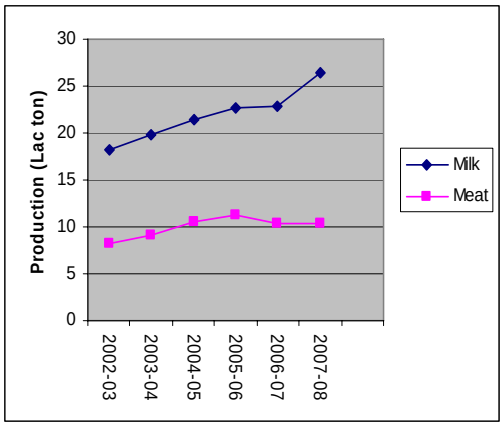

Fig. 7 Trend in production of milk and meat in Bangladesh
Data from Bangladesh Economic Review, 2009

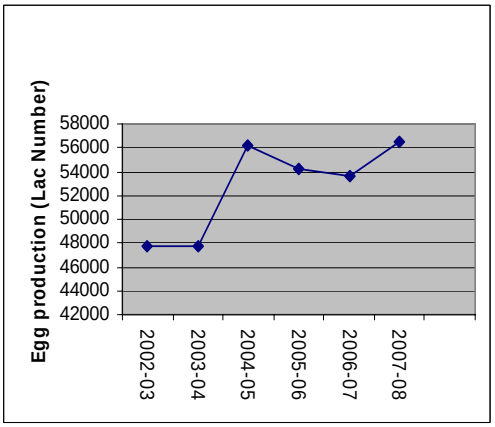

Fig. 8 Trend in egg production in Bangladesh

Fisheries

Long term growth rate in production of fish during 1971 to 2007 was 2.5%. During 2001-02 to 2007-08 total fish production increased from 1.89 million MT to 2.59 million MT with an average annual growth rate of 5.3%, while inland fish and cultured fish production had growth rates of 8.2% and 4.2%, respectively (Table 5). Overall shrimp production has increased steadily over the last 20 years (Figure 9 and 10), but still much lower than that of the neighbouring countries such as Thailand with 800 kg/ha (Samsak et al. 2005) and India with 600 kg/ha (Vasudevappa, 2005). Among shrimp producing countries, Bangladesh ranks fourth with respect to area under shrimp farming and sixth in volume of production.

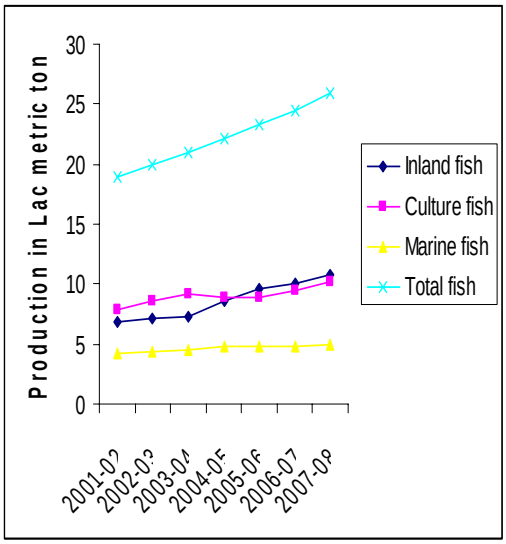

Fig 9. Trend in fish production
Data from Bangladesh Economic Review, 2009

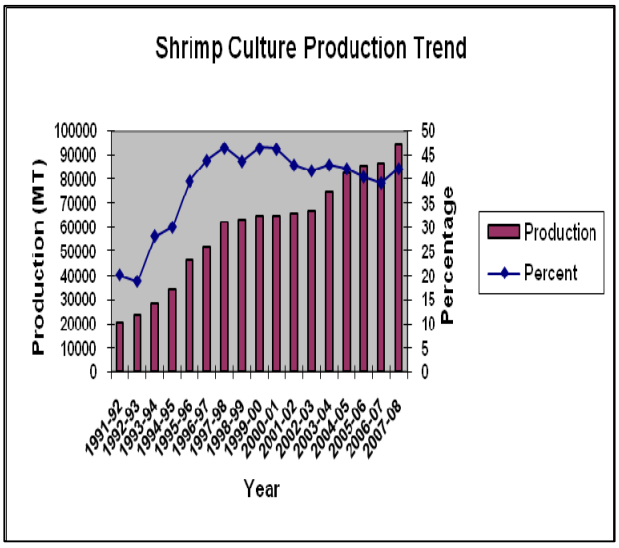

Fig. 10. Trend in shrimp production

Table 5. Recent trend in fish production in Bangladesh during 2001-08

Commodity	Growth (during 2001-2008)
Inland fish	8.2
Culture fish	4.2
Marine fish	2.4
Total fish	5.3

Source: Bangladesh Economic Review, 2009 and authors calculation

Forestry

The production of wood in Bangladesh since 1970 is increasing. This increase depends largely on the expansion of new social forestry plantations involving private participants. Beside these, over 10 million homesteads in about 88 thousand villages across the country possess a large quantity of trees. These homesteads are the major suppliers of wood for the nation. The role of the homesteads in growing stock is presented in Table 6. The total forest area in Bangladesh is 2.53 million hectare in 2007; but all do not necessarily carry tree cover. The tree covers 48.8% of the forest land.

Table 6. Estimated growing stock of wood in Bangladesh

Forest type	Gross volume of growing stock of wood, million m^3		
	1990	2000	2005
Hill forest*	19.34	17.26	16.03
Plain land forest*	2.07	1.98	1.97
Littoral forest* (Mangroves)	13.14	11.97	12.00
Village/homestead forest**	69.16	89.58	101.94

** Data from FAO, 2005.*

***Hammermaster data of 54.8 million m^3 in 1981 with growth rate of 2.62 (Choudhury and Hossain 2009 used to derive the estimated data).*

2.3 Current Food security situation

About 40% of Bangladesh's total population are calorie poor, consuming less than 2122 kcal per capita per day, while one-fifth of population are hard core poor who consume less than 1805 kcal per capita per day (BBS, 2007). According to SOFI 2009, Bangladesh has an estimated 40.2 million undernourished people in 2004-061. One positive aspect is that the proportion of undernourished in total population has declined from 36% in 1990-92 to 26% in 2004-06. Out of a total of 336.6 people who are estimated to be undernourished in South Asia, 12% comes from Bangladesh (India's share is 75%). The most recent estimates (Household Income Expenditure Survey – HIES, 2005) revised to up to 56 million (still 40% of the population) the absolute number of undernourished people, those who fail to meet minimum level of caloric consumption needs of 2122 KCal/person/day. Within this population 27 million are unable to consume 1805 Kcal/person/day and 11 million are below the consumption level of 1600 Kcal/person/day.

Food security worsens with inter-year shortfall in food grain production caused by climatic variations and natural disaster such as floods, tidal surge and insect and pest attacks. Variations in food intake also exist between regions of the country, between adults and children and between men and women at the household level.

Household Income and Expenditure Survey 2000 shows that malnutrition is widespread among the poorest 14 percent of the rural population, who consume only about 1600 Kcal per capita per day. Another 10 percent consume between 1600 and 1800 Kcal (BBS, 2000). Bangladesh Demographic and Health Survey (2004) shows that 43 percent of children under 5 are stunted and the prevalence of stunting increases from 10 percent of children below 6 months to 51 percent of children from 48-59 months of age. The survey also shows that mothers suffer from calorie deficiency and pregnant women suffer from anaemia.

[1] **Undernourishment** exists when caloric intake is below the minimum dietary energy requirement (MDER). The MDER is the amount of energy needed for light activity and a minimum acceptable weight for attained height, and it varies by country and from year to year depending on the gender and age structure of the population.

Bangladesh has made good progress since 1992 in reducing income poverty based on the national poverty line. The country was able to lower the overall incidence of poverty from 58.8 percent in 1991-92 to about 48.9 percent in 2000, with an annual rate of decrease of 1.8% per year. It further declined to 40% in 2005 with a decreasing rate of 3.9% per annum (Fig. 11). In spite of the advancement, about 57.7 million people are poor with one-third caught in hard-core or extreme poverty.

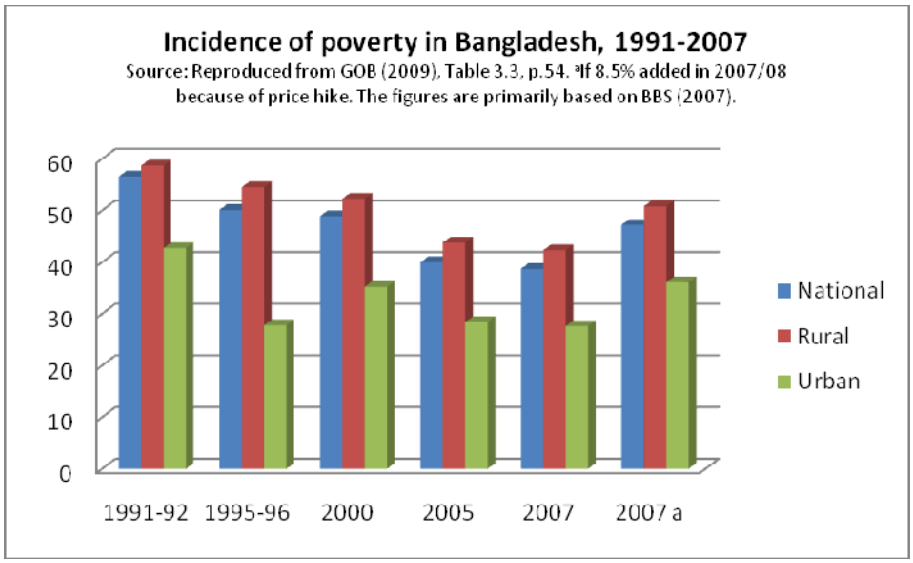

Fig 11. Proportion of population below national poverty line during 1991 to 2005 (estimates for 2007)

Bangladesh past efforts towards improving food security have resulted in a 5% point decrease in the proportion of undernourished between 1990-1992 and 2002-2004 down to 30%. However, mainly due to population growth, the number of undernourished actually increased from 39.3 million to 44 million (POA, 2008-15).

Based on one of the population projection of 181.4 million in 2015, attaining the MDG hunger target implies that the number of undernourished people must decrease to 31.8 million. Meeting the WFS hunger, i.e. reducing the number of undernourished to 19.65 million by 2015, implies that the MDG1 target needs to be overachieved with the proportion of the undernourished brought down to 11% (POA, 2008-15): a significant challenge for Bangladesh where the absolute number of undernourished has seen only a limited decrease in the period 2005-2009.

Table 7: Proportion and number of undernourished in Bangladesh

	Past status		**Current**	**Mid/Long Term Targets**
	1995-97	**2003-05**	**2004-06**	**2015**
FAO – Proportion of undernourished (%) Baseline 1990-92: 36	40	27	26	18 (MDG)
FAO- Number of undernourished, million – Baseline: 1990-992: 41.6	51.4	40.1	40.2	20 (WFS)

Source: Monitoring Report 2009 of the National Food Policy Plan of Action.

Total food grain (rice and wheat) production in 2006/07 stood at 28.05 million tons, but there was a short fall of about 1.05 million tons of rice (*Aus* and *Aman*) in 2007/08 due to double floods in August and September 2007. The total food grain production further increased to 32.17 million in 2008-09 (Monitoring Report, 2009 – Fig 12, below). In 2007-2009, rice availability, defined as the sum of net production and total import, was estimated to be 14-15% higher than the estimated human

consumption needs- assuming a consumption of 453 gm/person/day- while net production alone was estimated to be 12.6% in exceeds of needs implying achievement food grain self-sufficiency.

Availability of pulses, oilseeds, vegetables and fruits, which are the chief sources of protein, mineral and vitamin still remain far below the actual requirements, making it difficult to provide adequate diet for all. Fish production increased from 0.95 million tons in 1991-92 to 2.33 million tons in 2005-06. Meat, milk and egg production has also increased significantly over the years (Table 5), but the availability of these food items is far less than required for a nutritionally balanced diet.

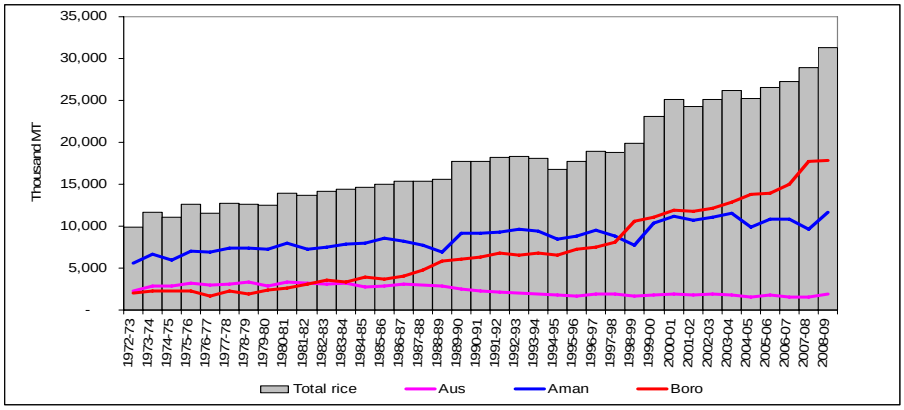

Fig 12. Rice production in Bangladesh (from 1972-73 to 2008-2009)

Generally, improvements in the production/availability of food grains have not been accompanied by commensurate increases in the production of other major foods, such as, pulses, oilseeds fruits, vegetables, fish, meat and eggs, which are essential for a diversified and balanced diet.

For a large growing population of Bangladesh, it is more important to know the per capita availability of food items. On a per capita basis, availability of cereals has increased from 453 gm/day in 1991/92 to 540 gm/day in 2006/07. Per capita availability of potato, fruits and vegetables has also increased, but per capita availability of pulses and oilseeds has remained stagnant or declined (Table 8). Fish availability per capita increased from 27 gm in 1994-95 to 41 gm in 2003-04. Availability of meat, milk and eggs per capita has also increased. Per capita per day availability of energy has increased from 2069 calories in 1991/92 to 2489 calories in 2003/04.

Table 8: Per Capita Availability of Major Food Items: 1994-95 to 2004-05

Food Items	Availability (gm/capita/day)		
	1994-95	1999-00	2004-05
Potato	32	57	108
Pulses	11	8	10
Oilseed	10	8	10
Vegetable	21	24	108
Fruits	24	22	68
Fish	27	35	41*
Meat	11	15	21
Milk (ml)	35	36	45
Egg (million)	2.76	4.20	5.54

*Source: BBS, DAE, DLS, DOF, BARC; * Refers to 2003-04.*

The average Bangladeshi diet contains very high intake of cereals (74.4% of total dietary energy of 2240 kcal) with too little contents of non-cereal food items and thus an average diet is not only

deficient in energy but also imbalanced and deficient in vitamins and minerals. Gaps between requirement and production of other important food crops and livestock products are wide. According to MOA estimate, deficit of pulses and oilseeds are 1.12 million tons and 2.26 million tons respectively (2004-05). Similarly, shortage of vegetables and fruits is estimated at 2.24 million tons and 2.70 million tons respectively. The national deficit of milk and meat is 10.54 million tons and 5.12 million tons respectively, and of eggs is 9,253 million (DLS, 2007). The national requirement of fish is estimated at 3.0 million tons, showing a deficit of 0.67 million tons (DOF, 2007).

There is wide gap between projected cereal production and requirements for 2014-15. The implications of this projected consumption and requirements for acceleration and sustenance of cereal and non-cereal food production is that it is necessary to change in land use pattern for crop diversification, and improvement in food processing and food consumption habit.

2.4 Current issues and Challenges

2.4.1 Enhancing food security for increasing population

Bangladesh economy already has much pressure to feed a large number of population of an estimated around 148.69 million, (BBS, 2007) however, UNFPA 2009 estimated a higher growth rate. Attaining the MDG hunger target implies that the number of undernourished people must decrease to 31.8 million. Malnutrition is widespread among the poorest 14 percent of the rural population, who consume only about 1600 Kcal per capita per day. Another 10 percent consume between 1600 Kcal and 1800 Kcal. Moreover, increased population will create extra pressure on availability both food grain and non-grain items. Therefore, in order to feed approximately additional 2 million population each year, productivity of both food grain and non-grain commodities should be enhanced. In all likelihood, Bangladesh will not meet the MDG-1 target for halving the proportion of the population below the minimum level of dietary energy consumption by 2015.[2]

Diets consumed in the rural areas (and also in the urban slums) are highly imbalanced resulting in high prevalence of anaemia and malnutrition. The challenge, obviously, is to diversify food production as well as ensuring access to and consumption along with measures to improve food safety on priority basis.

2.4.2 Poverty reduction

About 57.7 million people, i.e, 40% of total population are still poor of which one-third caught in hard-core or extreme poverty. Usually incidence of poverty is much among female headed households. The women and children suffer more from poverty and malnutrition. One aspect of women's poverty is that the total number of poor women is higher than that of poor men. Various micro studies indicate that the 'hard-core' poor are largely women. The number of ultra poor (measured by food intake of 1,600 k.cal/person/day) and extreme poor (food intake of 1,805 k.cal/person/day) is higher in female headed households than in male headed households. The HIES 2005 shows that about 29.6 percent of divorced/widowed women live below the lower poverty line against the national average of 25.1 percent.

[2] The gap between the projected 2015 rate and the MDG target is particularly large (36% vs. 24%), using the 2122 kcals/ cap/day threshold (GoB–UN, Achieving UNDAF-MDG-1-Hunger Targets in Bangladesh (GoB and UN Bangladesh, June 2010).

In rural areas, landlessness and agriculture daily wage labour are found to be strongly correlated with income poverty (World Bank, 2008). Conversely, successes in moving out of poverty in rural areas strongly depend on the capacity of households to diversify into more profitable activities. Currently the agricultural sector as a whole (crop, horticulture, livestock, and forestry) contributes around 21% of GDP and employs more than 70% of the population. Because of their positive effects not only on food availability but also on real wages, interventions aimed at increasing agricultural productivity in labour intensive/higher value crops, especially through the use of high yielding/hybrid varieties, but also climate stress-resistant varieties and technology packages - should thus be stepped-up, with a special focus on small and marginal farmers. This should go along with efforts to improve marketing and agribusiness management systems. In this process, the development/strengthening of agricultural value chains deserves special attention.

The agricultural technology has played an important role in increasing agricultural productivity and rural non-farm activities. This has contributed to reduction in rural poverty through an increase in farm income, reduction in real rice prices (an important wage good for the landless rural and urban poor), an increase in rural employment and reduction in vulnerability for the poor. Reduction in real rice prices, while of benefit to the poor, also provided necessary incentives to farmers to diversify into high value crops. Increasing productivity in other crops, particularly maize, potatoes and vegetables, as well as in fisheries and livestock, has the potential for poverty reduction.

2.4.3 Wide yields gap

There is a wide gap between farm yields and experimental stations. This is true across crops, fish and livestock. The yield gaps even in the favourable agri-ecological regions often exceed 40% of the farmer's achievable yields with good practices. The total production of food crops, livestock and fisheries can be increased tremendously through reducing yield gaps. Reduction of such yield gaps requires expanding capacity of farmers and extension system, need-based and appropriate technology generation and dissemination. Also research programmes aiming at bridging these yield gaps have enormous potential of reducing food insecurity to a large extent. Meeting this challenge up to a considerable extent may be possible through on-farm research with direct participation of farmers. Also awareness building for quick dissemination of agro technology through demonstration, training and mass media publicity will be needed to minimize yield gap.

2.4.4 Land related constraints

Cropped land is declining at the rate of about 1% per year. On an average, Bangladesh is losing good quality agricultural land by approximately 80,000 ha annually due to urbanization, building of new infrastructure such as roads and implementation of other development projects. This issue needs to be addressed by formulating and implementing a new national land use policy that stops and/ or slows down the rate of decline in agricultural land.

There is considerable extent of degradation of agricultural lands caused by soil erosion, river erosion, soil fertility decline, depletion of soil organic matter, water logging, soil salinity, pan formation, acidification and deforestation (Table 9). Last three decades 170,000 ha area of agriculture land has been affected by increased salinity.

Table 9. Degradation of Agricultural Land

Causes	Affected Area (million ha)	Remarks
Soil erosion	1.70	Agricultural land can
River erosion	1.70	be grouped as:
Soil fertility decline	8.00	
Depletion of soil organic matter	7.50	very good (2%),
Water logging	0.70	good (34%),
Soil salinity	0.84	moderate (39%),
Pan formation	2.82	poor (16%)
Acidification	0.06	very poor (9%).
Deforestation	0.30	

Source:. Karim, et al, 2001 and Karim 2009.
Notes: The affected land categories are not mutually exclusive. Almost all of the 8 million ha land with decline in soil fertility is deficient in phosphorus, potassium, and sulphur, particularly for growing HYV rice and upland crops.

Soil fertility degradation is occurring in Bangladesh due to imbalance use of fertilizer and the intensification of crop cultivation and the advance of mono-culture rice without rotation. In the past Bangladesh government policy of subsidizing only nitrogenous (urea) fertilizer, the farmers commonly have over-applied urea fertilizer without considering for applying balance dose of phosphate and potassium fertilizers or other minor elements. Furthermore, farmers do not use other elements such zinc, boron and sulphur for crop production in right amount, thus failing to provide a balanced nutrient to their crops. Imbalance use of fertilizer has degraded soil health resulting loss of yield. The important reasons for soil degradation are inability of resource poor farmers to procure and use balanced inputs for crop production; and increased use of crop residues instead of leaving it on the fields as compost, increased use of cow dung as fuel, instead of using as fertilizer. Also distribution of agricultural land in Bangladesh is highly inequitable, 80% of households owning only 0.02 to 1.0 ha (marginal and small farmers).

Land and soil erosion

Water erosion accounts for about 40 percent of land degradation due to washing away of topsoil and depositing sand on the croplands from upstream. Riverbank erosion and siltation are chronic concerns for Bangladesh. About 1,200 kilometres of riverbank are eroding and more than 5,000 kilometres river banks face erosion-related problems in the country. The major rivers such as the Jamuna, Ganges and Padma consume several thousand hectares of floodplain making thousands of people landless and homeless every year. During the last three decades the Jamuna, Ganges and Padma rivers have consumed about 180,000 ha. (BWDB 2009). This amount excludes the annual erosion along the other major rivers and also in the Meghna estuary where erosion is particularly high. From the 1970s to early the 1990s, the extent of mean annual erosion was about 3,300 hectares along both banks of the Jamuna River only. The Flood Action Plan, Bangladesh predicts a net erosion loss in the Brahmaputra-Jamuna basin of 34,120 hectares of “mainland” acreage for the period 1992-2011, an area similar to what had eroded in the 12 years previous to that time (MPO 1987). Similar rates of net loss in land due to erosion are expected in the other three main rivers. The river bank erosion is expected to increase further with the rise of water flow in the rivers due to global temperature rise and increased ice melting in the Himalayas.

Land accretion

The average sediment load that passes through the Bangladesh to the sea is huge, about 1–3 billion tons a year (BWDB, 2009). A part of this is deposited on the flood plains, gradually changing their topography and accreting new land within, adjacent and estuary of the major rivers called *Charlands*. Due to the erosion, the net loss of agricultural land is of some 3,300 ha per year, being the annual accretion about 4,656 ha and the erosion is about 7,978 ha (ISPAN, 1993). The *charlands* are

frequently subject to erosion. Active floodplains, i.e. *charlands* and adjoining bank lines, account for about six percent of total land area of the country and support four percent of the total population. However, land use and land tenure in these areas is transitory due the nature and productivity of the land. Charlands have lower economic productivity due to a high sand content in the soil base. Similarly, lower agricultural productivity in the *charlands* relative to similar areas outside the active floodplain reflects not only soil conditions, but also uncertainties of erosion and frequent flood damage. On one hand, riverbank protection measures and dredging may increase the water flow capacity during the summer, and on the other hand development of plantation in the charlands may stabilize the newly accreted lands.

2.4.5 Scarcity of quality water for irrigation

Scarcity of surface water

Expansion of surface water irrigation by LLP has stagnated in recent years, largely due to reduction of trans-boundary stream flows, shrinkage of wetlands and siltation of river resulting reduction of base flow to the river and increased salinity. As the lowest riparian of all the 57 transboundary rivers, Bangladesh carries huge sediment load through its river system. According BWDB it is ranging to the tune of 1.0 to 1.4 billion ton per year. This resulted in a serious deadlock in the available flow during the dry season. Capital dredging in water resource management is vital in the context of revitalization of the river systems that already deadlocked due to huge sediment influx. The implementation of the capital dredging programme in one hand will revitalize the river system and establish the ecological balance. Bangladesh Water Development Board and SRDI are collecting and maintaining soil and water salinity data. FAO has provided support to CEGIS for compiling, updating and interpretation of the salinity information.

Water salinity level increased considerably in the year 2008 compared to reference salinity information of 1980s developed by MPO (Fig 13, below). Water salinity level has increased at most points in alarmingly high rate over the last 30 years, on an average of 172%. Maximum increase of 19,988 micromoles/cm is in Khulna region followed by 14,420 micromoles/cm at Nalianala (Hadda). The highest percentage increase of 1,143 micromoles/cm is registered in Sarupkati river at Uzirpur during dry season. In areas like Gopalgonj, Tongipara and Narail the salinity level increased from 200% to 400%. Increase in salinity level demonstrates a high level of risk due to massive reduction of upstream flow.

Groundwater level decline

Over the last decade irrigated area has significantly increased owing to the rapid expansion of Shallow Tube Wells (STWs). It has already resulted in a continued decline of water tables during the peak dry months (March-April). Groundwater levels in some places within the north-west region of the country have gone beyond 10 m which exceeds the suction lift limit of the pumps. To overcome this situation, alternative option of lifting irrigation water is the Force Mode Tube Well (FMTW), which is expensive technology and without subsidy, is not within the affordable limits of farmers.

Arsenic pollution

It has been reported that arsenic contamination of the tubewells, especially STWs and Hand Tubewells (HTWs), have occurred due to over exploitation of groundwater. Within 59 districts of the country where about 1.44 million tubewells have been affected and people are exposed to arsenic toxicity (FAO / UNICEF, 2009).

Low water-use efficiency and productivity

Irrigated agriculture of the country is impeded by low water use efficiency and low water productivity i.e. production of crop in kg per cubic metre of applied water. The irrigation water efficiency in STW command areas is below 60% and the water productivity is equally low at about 0.3 kg/cubic metre of water (MoA, 2006). This situation has been created by faulty design of equipment, improper matching of pump and prime mover, improper operation and maintenance (O&M) of pump sets, water losses in conveyance and distribution at field level, etc.

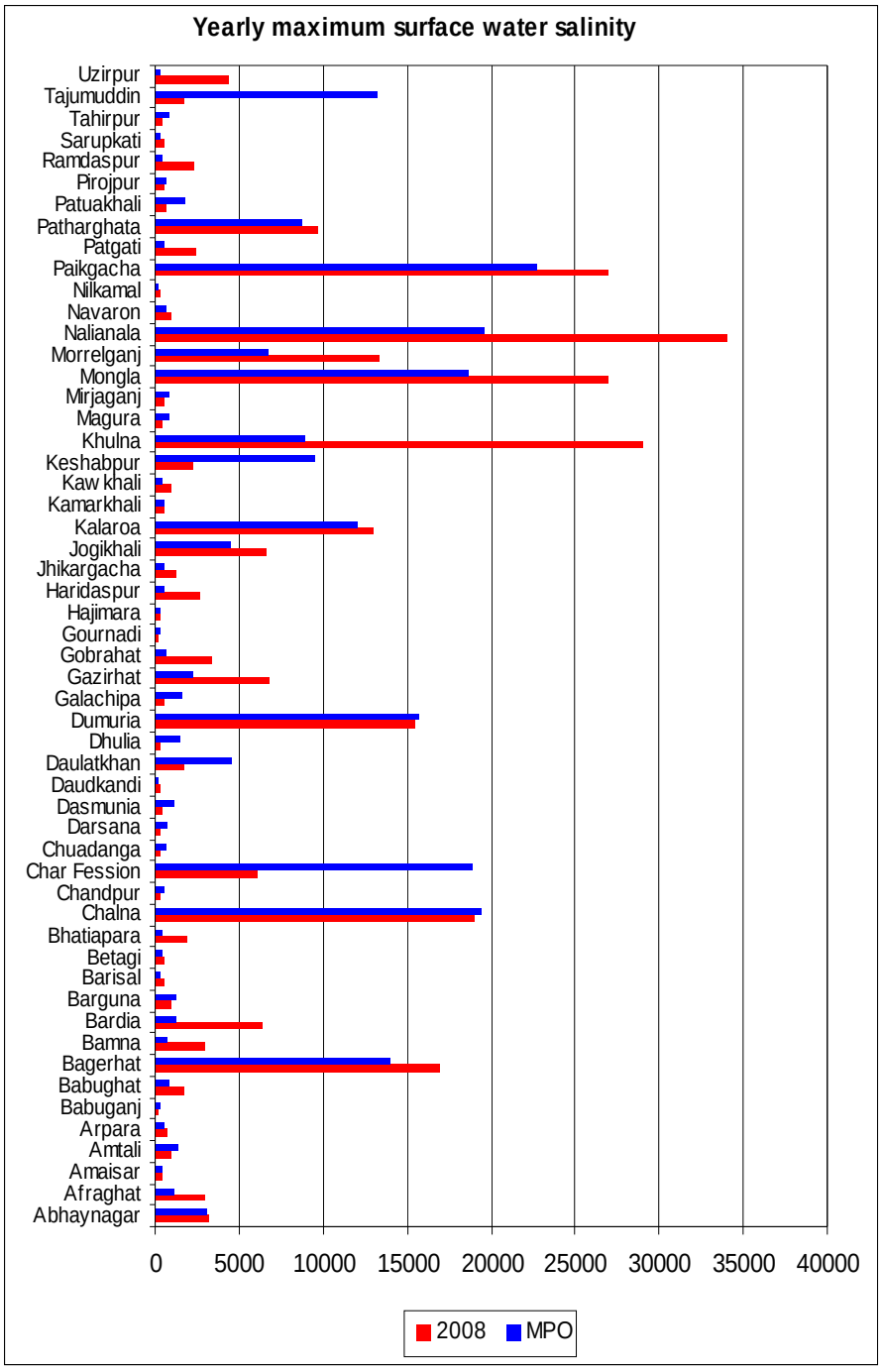

Fig. 13 Yearly maximum surface water salinity

Drainage congestion and water logging

Because of low-lying topography the country is inundated during monsoon season each year and vast area remains under water logging condition even after recession of flood. So, drainage is equally important like irrigation; because the benefits out of drainage are: (i) potential increase in cropped area, (ii) higher yield from transplanted Aman rice through early planting, (iii) more control over crop calendars and patterns through control of water regime. But, little attention has so far been paid to the importance of field drainage to intensify crop production and increase yields.

Cost of irrigation

Cost of irrigation is one of the vital factors considered for profitable agriculture. Around 90% of the minor irrigation equipments are operated by diesel fuel and the rest are electrically driven prime movers. Cost of irrigation using electrically operated pumping sets are 30 – 35% lower than those using diesel engines. But, major disadvantage is the severe load shedding every year, especially during the dry season when demand for irrigation is in the peak.

2.4.6 Increased environmental vulnerability and climate change impact on agriculture

Bangladesh is one of the largest deltas in the world, with a network of 230 rivers and rivulets and a coastline of 710 kilometres, hosting a unique diversity of ecosystems. In Bangladesh, about 30 million people are coastal inhabitants, relying on agriculture, fisheries, forestry, salt industries, etc for their livelihood sustenance. The coast of Bangladesh is identified as a zone of vulnerability.

There have been more frequent floods and high intensity cyclones occurring in the country. IPCC in 2007 and Karim (2009) have made the following observations on the impact of climate change on Bangladesh agriculture:

- Average temperature has registered an increasing trend of about 1°C in May and 0.5°C in November during the 14 year period from 1985 to 1998.
- The annual mean rainfall exhibits increasing trends in Bangladesh. Decadal rain anomalies are above long term averages since 1960s.
- Serious and recurring floods have taken place during 2002, 2003, and 2004. One major flood hit the country in 2007 too.
- Frequency of monsoon depressions and cyclones formation in Bay of Bengal has been noted to decrease since 1970 but the intensity has increased.
- Water shortages have been attributed to rapid urbanization and industrialization, population growth and inefficient water use, which are aggravated by changing climate and its adverse impacts on demand, supply and water quality.
- Salt water from the Bay of Bengal is reported to have penetrated 100 km or more inland along tributary channels during the dry season.
- The precipitation declines and droughts has resulted in the drying up of wetlands due to decrease of up stream flow and intensification of irrigation resulting severe degradation of ecosystems during dry season.

Agriculture in Bangladesh is very much prone to hazards and 70% of all disasters originate from weather-climate extremes. In addition to cyclones, tidal surges, tornadoes, floods, droughts etc. the country is one of the most vulnerable ones to climate change; in particular it seems vulnerable to sea level rise – but data have yet to demonstrate the causes. Climate change has several after effects on

water resources which are: water scarcity, reduction in fisheries production, poverty, lack of potable water, sanitation and hygiene problems, conflict among users and environmental hazards etc. The most important challenge for agriculture in the country is to develop technologies e.g. crop varieties, production packages etc. to escape from the on-set of natural hazards like cyclones, tidal surges, water and soil salinity, floods and climatic changes risks.

Due to its position in the delta, the Southern region is the most affected by environmental risks, including climate change, and has the lowest records of agricultural development. The current agricultural land use in the South consists of transplanted Aman rice, irrigated Boro rice, agro-forestry, livestock and fisheries (eg: shrimps), but their productivity constrained by the predominance of traditional technologies. Nevertheless, the region has very good bio-physical resource base and diversified opportunities for integrated crop, fish and livestock farming. Greater R & D thrust would be required for this unfavourable eco-system with a view to boost up agricultural and rural development and food security.

2.4.7 Lack of organized market and low value addition

Lack of organized market for selling farm produce is an important problem for Bangladesh. The salient features of agricultural product markets are poor infrastructure, with lack of storage and processing facilities, poor roads and communication system, unfair practices of middlemen, etc. The marginal and small farmers are often facing problem of marketing their product and are not getting fair price due to existence of trade syndicates. Government initiatives and supports will be required to develop market access services for small producers, marketplaces, market outlets and farmers' groups. Credit facilities would be required to promote private initiatives for small and medium-scale agri-businesses in processing and packaging. Formation of farmers' groups with enhanced access to credit will be needed to encourage their direct participation in the marketing of agricultural produce. Fair price for agricultural crops and products need to be ensured.

There is large post harvest loss around 20% (Table 2.4) in rice and 30% in vegetables and fruits. There is also a substantial scope to increase agricultural production by reducing post-harvest losses, by increasing the shelf life of perishable commodities and by adding value through agro-processing of agricultural commodities into finished or semi-finished products, packaging in appropriate containers, proper storage and exports. The food processing industry in Bangladesh is growing. The policy, institutional and infrastructure barriers to agribusiness, agro-processing and supply chain need to be removed in order to provide a "big push" to agriculture and rural development. The production and processing of these products is also labour intensive and, therefore, is likely to have a significant favourable impact for generating additional employment in the rural areas.

Table 10. Post harvest losses of major corps in Bangladesh

Sl. No.	Food crops	Production (million tons)	Loss (%)	Total losses (million tons)	Cost/kg	Total loss (Million Tk.)
1.	Rice	29.75	12	3.57	8.00	28,560.00
2.	Wheat	0.77	13	0.10	8.00	8,000.00
3.	Maize	0.78	13	0.05	5.00	475.00
4.	Pulses	0.56	15	0.08	25.00	2,075.00
5.	Oil seeds	0.55	15	0.082	20.00	1,640.00
6.	Spices	1.46	15	0.22	10.00	2,200.00
7.	Vegetables	8.75	30	2.62	4.00	10,492.00
8.	Fruits	7.88	25	1.97	9.00	17,721.00
9.	Potato	5.37	20	1.07	8.00	8,592.00
10.	Sweet potato	0.72	20	0.15	3.00	435.00
11.	Sugarcane	3.51	20	0.70	2.00	1,404.00
	Total	600.94		106.63	-	81,594.00

Source: Post-harvest Technology Division of BARI

2.4.8 Inadequate coverage of animal health service

The ratio of Veterinary Surgeons to farm animal and poultry is as low as 1/100,000 for livestock and 1/2,000,000 for poultry. The problem is again aggravated with poor transport network leaving 80% of the farmers outside of veterinary service. Only about 15-20 percent of farm animals are occasionally vaccinated. Private sector investment in the animal health sector remains low and is unlikely to expand in the future, unless provided adequate policy support and extension service. While the quality and quantity of vaccine, medicine and veterinary service delivered by the DLS are inadequate, the private sector is not coming up. There is no independent authority to check the quality of domestically produced or imported vaccine, medicine, feed and other inputs and there are no provisions for control of movement and quarantine during disease outbreak or epidemics.

Disease diagnostic facilities are limited. The DVH (District Veterinary Hospitals), Regional Field Diseases Investigation Laboratories(R FDIL) and the Central Disease Investigation Laboratory (CDIL) of DLS are responsible for providing diagnostic services. However, due to shortage of skilled manpower and non-availability of funds they cannot provide the desired services. It is necessary to develop Epidemiology Unit for disease investigation and a Veterinary Drug Quality control laboratory. There are only few local veterinarians trained in clinical pathology to diagnose diseases properly. The Veterinary Public Health Unit in the DLS has the mandate to perform diagnosis, surveillance and control of zoonotical diseases, ensure food safety of animal origin, and liaison with the Health Department. The Unit is however, suffering from serious shortages of human capital, funding and laboratory facilities.

Most of the drugs traders and shop keepers have no formal training on drug handling, transportation, storing and dispensing, and readily sell drugs such as antibiotics, hormones, and sedatives across the country without prescription.

2.4.9 Management of public water bodies and restoration of habitat

Inland open water fisheries are inhabited by 260 fish, 24 shrimp and 12 exotic fish species. During early 1970's inland open water capture fisheries contributed about 90% of total fish production whereas, in 2007-08 it has reached up to only 41%. In fact gradual decline in open water fish production in the country is happening due to environmental degradation and species depletion. Among 260 fish species, about 143 species are termed as small indigenous species which was abundantly available in the past. Because of habitat destruction/ reduction and over exploitation, most of those species are not available in the market. Meanwhile, 54 fish species have been listed as critically endangered and vulnerable in the red book of IUCN, Bangladesh during 2003. Besides, 21 other fish species have already been extinct. To increase overall fish production of the country, such stock depletion trend must be reversed by effective conservation measures.

A major part of the open water fisheries is common property resource being managed by many agencies other than fisheries. As a result, these water resources are not being used as a primary source of fish production. Rather, these are used for revenue generation, irrigation and other secondary purposes. Utilization of such resources for secondary purposes leading to the development of several infrastructure causing a reduction, alteration and degradation of natural habitat through retardation of reproduction potential and growth. To increase fisheries production, these encroachment of habitat destruction needs to be halted and developed for fisheries production. The existing leasing system of freshwater bodies to individuals is also problematic.

Individuals have limited incentives for conserving the biodiversity of the resource base. It is necessary to reform existing leasing policy from revenue orientation towards increased productivity and biodiversity management. In 2001 BARC has reported in its Red Data Book that more than 100 species of vascular plants are either extinct or endangered. There is no data of huge loss of agro-biodiversity in different regions of the country in which Bangladesh is very rich.

2.4.10 Low productivity of aquaculture

The productivity of freshwater aquaculture for fish under traditional, low input management is much smaller than the potential. Several extension projects, including the Mymensingh Aquaculture Extension project (MAEP), for example exceeded in raising production, readily achieving 3,000 kg /ha/year. Greater productivity can be attained largely by adopting improved management practices and using quality fingerling and feeds. In order to address some new challenges supports would be needed to both males and females involved in fisheries activities on brood stock management, production of quality seeds, feeds and control of infectious fish and shrimp diseases. There are scope for using pond and pen culture technique to expand carp poly-culture to new areas. A very significant area comprising many small water bodies, ditches and derelict ponds could still be brought into production under communal ownership. Community management may be the most useful approach for developing fish farming in such unused ponds and ditches.

There is great need to strengthen the national capacity in monitoring the capture as well as aquaculture production by collecting and reporting the statistic data systematically. The statistic standards used for data collection on aquaculture need to be improve and updated to reflect the status and development trend of the sector in improved details.

Improving the productivity of brackish water shrimp

Since many of the farms produce several crops of shrimp each year, productivity per ha is very low compared to the several thousand kg per ha per year obtained in major shrimp farming countries such as Thailand, China and Vietnam. Improved productivity can be achieved through improved technology. The industry should also move to the use of disease free seed from brood stock produced in a land based captive breeding program and halt the capture of mother shrimp so that wild stock may be protected. This would also be a key step to effective disease management in shrimp farming.

There has been large genetic degradation in carp stock due to continuous inbreeding in the hatcheries. Poor fingerlings are now produced from in breed-broods resulting reduction in yield and quality of carps.

Incidence of shrimp disease has caused some damage to the shrimp industry. However, no appreciable preventive or curative intervention measures appear to have been taken to address the issue. Research efforts need to be enhanced for immediate prevention of such outbreak.

2.4.11 Stock assessment of marine fisheries

The stock of marine fisheries is rapidly depleting due to over fishing and improper management. There is always a need of regular stock assessment of all kinds of marine fisheries. GOB requires Support is needed for stock assessment of marine fishes and conservation of this resources.

2.4.12 Degradation of forest resources in protected areas

Deforestation is a cause of land degradation when the steeply and sloping land is cleared or has shallow or easily erodible soils such as in Chittagong hill districts and when clearance is followed by shifting cultivation "Jhum" in the hill districts. Encroachment of forest land due to population pressure and crop/horticultural farming is also regarded as a major cause for deforestation. FAO reported in 1988 that Bangladesh accounted annual losses of about 38,000 hectares of forest between 1980 and 1988. A large tract of forest land is denuded in the north-east and Chittagong hill tract regions. Absence of participatory co-management practices has been identified as the principal cause of degradation.

2.4.13 Low productivity of forestry

The output of forests in Bangladesh is one of the lowest in the world. Even within the country the yield of forests managed by Forest Department is less than village forests. Apart from illicit felling, the productivity is low due poor management practices, low initial survival, incompatible species composition, low soil efficiency, etc. The other problems in low productivity call for immediate addressing appropriate management practices including improving the nursery techniques, selection of site specific species, using quality planting materials, controlling pests and diseases, applying appropriate silviculture practices, etc and in order to achieve this developing capacities of extension and foresters.

2.4.14 Lack of availability and quality of seeds, seedlings, fingerlings, feeds, fodder and day old chicks

Availability of quality seed

The main challenge of the seed sector is the production and supply of required quantity of quality seeds of different crops to the farmers. Use of quality seed is the key input to increase the crop productivity. Because of the use of low quality seed together with other factors, the productivity of almost all crops is one of the lowest in the world. At present the supply of quality seeds, average of major crops, comes to only 20%, the remaining 80% seeds are of poor quality resulting low crop productivity and total production. A programme of steady increase of production and supply of quality seeds is the only alternative.

Production of breeder seed

The prerequisites for increased production of quality seeds (certified and TLS) are increased production of breeders seed and foundation seed. Therefore, another major challenge of seed sector is the production of required quantity of breeder seeds and farmers' seeds, the main responsibility of NARS and BADC. Maximum utilization of available facilities, re-modelling of programmes and capacity building are some of the important areas for consideration.

Improvement of farmers' seed

Another challenge is the improvement of farmers' seed that occupies the largest acreage. Studies indicated that much improvement of farmers' seed is possible by following proper method of processing and storing seed at farmers' level. Providing extension services and training of male and female members of the family associated with seed production, processing and storage is to be considered as a preferred programme.

Feeds and Fodder

The acute shortage of feeds and fodder is one of the single most important obstacles to livestock development in Bangladesh. Feed resources for livestock are primarily derived from crop residues and by-products such as straw, grass and tree leaves. Supplementary and concentrate feed are provided rarely and inadequately. This has resulted in stunted growth, reproduction and reduced productivity.

Most of the dairy, poultry and fish farmers are facing the problem of adulterated and inferior quality of commercial feeds and feed ingredients. Feed labelling and control is inadequate. Most feed millers do not disclose the necessary information on the packaging with regards to feed composition, ingredients, date of manufacturing, date of expiry, storage guidelines, energy levels, and protein and vitamin contents. Further, poor packaging causes quicker spoilage and deteriorating quality and threatening both livestock, fish and human health. High price of feeds and fodder are also a problem for the smallholder livestock and fish farmers.

2.4.15 Declining efficiency of existing fertilizer plants and lack of initiative on establishing new one

Urea is produced locally using natural gas as feedstock by BCIC in a number of factories. Urea production once peaked at 2.1 million tons in 2002-2003 and since then production has been falling due to shortage of natural gas and ageing of the manufacturing plants. Some of the plants require rehabilitation and replacement of old machineries in order to enhance in full-capacity production and promote competition in fertilizer industry to induce efficiency in a self enforcing way.

2.4.16 Food safety, quality and standards

The issue of food safety, quality and standards is quite significant for Bangladesh for a number of reasons, more importantly for reducing the burden of food borne diseases, achieving better nutrition and health standards and for improving international trade outputs for agricultural produce and fish products. Combined with the setting up of a regional laboratory system as proposed under the SAARC Strategies and Programme for Food Security or under a different scheme, Bangladesh will be able to exploit its natural advantage for producing agricultural produce and the fisheries.

This should cover issues such as:

- drafting and implementing modern and effective policies, laws and legislation with regards to food safety and quality, based on science (risk-based approach);
- implementation of effective and integrated food safety and quality controls throughout the food production and supply chain, including consumption;
- effective coordination between different departments and organizations having jurisdiction over different parts of the food chain;

- capacity and resources in terms of laboratory infrastructure, inspection infrastructure, manpower capacity & capabilities to address the risk-based approach;
- The scientific bases to quality and safety;
- fostering Public private partnerships in food control systems – e.g services outsourced to private sector such as food safety and quality. testing by accredited private labs;
- overcoming challenges to meet international/ regional trade requirements in terms of SPS / TBT measures-;
- and foster agreements and arrangements with other countries for imports/ exports.

2.4.17 Modernization of agricultural sector

Modernization in Bangladesh agricultural sector is going on with the increased use of power tillers, irrigation equipments, threshers, drum seeders, maize shellers, rice milling machine, improved storage, cool-chain and transportation, etc. Farm machinery, such as, weeders, threshers, winnowers, centrifugal pumps etc. are developed and manufactured locally with locally available materials. Manually operated weeders and sprayers are used widely and amounts to about 200,000 and 1,000,000, respectively. A few hundred pedal and power operated winnowers are also being used in the country (Roy and Singh, 2008). It was found that farm mechanization promoted commercial farming and helped in reducing post harvest losses. Post harvest loss in agriculture amounts over 4000 million US$ a year. Proper grading, packing, pre-cooling, refrigerated storage and transportation can reduce these losses and maintain the quality. Mechanization in the country is associated with some inherent drawbacks like, fragmented lands, poor buying capacity of farmers, lack of quality machines for farm operation, inadequate knowledge of the users about machines and insufficient awareness building activities. For the modernization of the agricultural sector, support is needed on skill development of researchers, capacity building of manufacturers, formulation of agricultural mechanization policies, support to the formation of farmers groups, including women farmers groups and their capacity development, review and rationalization of current tariff rates and expand credit facilities for farm mechanization.

2.4.18 Weak National Mainstream Extension Approach

National Mainstream Extension Approach of DAE, DLS and DOF are weak. Things are changing in and around the agricultural sector. DAE, DLS and DoF as the main public sector ESP, have not changed since late 80s to cope with emerging challenges. Organization reforms of these agencies are badly needed in order to make extension service demand-led , efficient and effective.

The Decentralized Extension Approach (DEA) is adopted as the mainstream extension approach for DAE, DLS and DOF under the WB funded National Agricultural Technology Project (NATP). The DEA is designed to cover a range of extension activities including organizational reform and capacity building of Extension Service Providers (ESPs). Only 120 Upazilas of 25 districts of the country will be covered by NATP during a period of five years from 2007. IDA/WB will provide limited fund, not enough to cover all activities of DAE, DLS and other ESPs. Funding remains as a problem for implementation of all activities of DEA. DEA should be reviewed and improved. For enlarging availability of extension services to all categories of farmers, sharing of resources, knowledge and skill is essential. However, the insufficient establishment of partnerships between public and private ESP reduced the potential for the extension services to be made demand-led, cost effective and participatory.

DAE has supplied computers up to district and Upazilla level. DLS and DOF have also supplied computers up to district level and in some cases up to Upazilla level. Nevertheless, the functioning of internet connection established is not sufficiently operational, mainly because of a lack of skilled manpower, of backup support and of the inadequate availability of fund. This hampers quick communication for sharing of transfer of technologies, monitoring and reporting. The use of information and Communication technologies (ICT) can bring dramatic change in delivery of demand-led extension service by extension workers to farmers as pilots show but need to be upscaled to the national level.

Training and involvement of professional or paraprofessional women in the extension delivery system is poor as it is evident from ECS 2003. Women involvement is important for post harvest and homestead income generating activities and also for their social empowerment as well as for increasing household income, food and nutrition security. Organizations seem to be aware of the importance of involving women in agriculture, but initiatives are limited and not upscaled to national level.

3. Proposed Priority areas

3.1 Reducing poverty and enhancing food security (access and utilization)

Poverty reduction and enhancing food security is an important commitment of GOB reflected in all planning documents such as the PRSP-I, NSAPR-II, Fifth Five Year Plan and Perspective Plan. Poverty reduction and enhancing food security can be achieved thorough increasing productivity of crops, livestock, fish and forestry; agricultural diversification and increase of non-farm activities.

Increasing access to food

Poverty incidence has markedly decreased in both rural and urban areas. However, many poor and vulnerable households, whether food producers or not, are food insecure because unable to afford a minimum basket of food items through their own food production, cash income, market purchases and other resources necessary to acquire safe and nutritious food. Access to food for the poor could be increased through community empowerment and support to community driven processes that foster self-help and the creation of community assets such as market/storage infrastructure, basic health and education facilities and support income generating activities, through micro and small group enterprises. These forms of employment may concern in farm and non-farm, food or non-food activities, pro-poor business development as well as intervening on markets for sustainable supply of essentials. Scaling-up of safety net programmes should involve the creation of food reserves at all levels (communal, district, national) run by public or private entities that could buffer food price hikes. Enhancing women participation in agriculture and entrepreneurship development is key for success in these areas.

Improving food utilization

Promotion of food security should follow the guidance of the National Food Policy Plan of Action, structured along the three main dimensions of food availability, access and utilization (including the promotion of food diversity, home gardens and small livestock production, for the explicit purpose of increasing the household consumption of micronutrient-rich foods).

In subsistence agriculture situations, the nutritional status and to a large extent health, depends on access to the quantity and quality (including diversity) of food supplied by domestic agriculture where women predominate. *Integrated homestead gardening systems* for example and community organizations that make the sharing of food supplies a custom need to be promoted to improve nutrition and livelihoods. *High density mixed fruit orchards and multi bed vegetable systems need to be promoted to ensure a regular and substantial supply of micronutrient rich foods to the household.* The low bioavailability of some key micronutrients from foods, such as iron, for example, is significantly enhanced with the right food combinations and with appropriate food processing and preparation techniques that should be made available particularly to women.. Simple appropriate technology for the preservation of micronutrient-rich foods needs further development and promotion for year round availability. Food processing and food safety for food security for improving livelihoods is another area for focus. Together with the Government, FAO should seek synergies with other mechanisms such as REACH, MDG-F and project Laser Beam, for which Bangladesh has been selected as a pilot country. Concerted efforts should also be made to ensure alignment of priority actions with the Scaling Up Nutrition (SUN) framework linked to the first 1,000 days of life.

3.2 Increasing food availability through increased farm productivity and agricultural diversification

Scaling up of proven technology in favourable agro-ecological zones for minimizing yield gaps

About 60% of the land area falls within the favourable agro-ecological zone. However, there exist considerable yield gap between research stations and farmer's fields. In order to minimize yield gaps knowledge sharing on and scaling up of proven technology in favourable agro-ecological zones would be required. Also supply of quality seeds, planting materials, breeds, HYV fodder, broods and fertilizers need to be ensured in an equitable manner, especialy considering the gender roles in these activities..

Enhancing production of high value agricultural commodities

Government will emphasize on increasing production of high value agricultural commodities especially maize, pulses, oilseeds, fruits, vegetables, flowers, ornamental and medicinal plants, fish, meat, milk and egg. Also emphasis should be given to infrastructure, rural knowledge and marketing network development and integration of supply chains including processing, storage and transportation at the local and national levels. Emphasis will be given in issues such as product standardization, food safety, sanitary and phyto-sanitary measures etc. Priority will be given in relay cropping, mixed cropping, intercropping in the field and in the orchards and reserved areas by shade loving crops and good farmer's practices will be considered in different potential agro-ecological zones.

Improving diagnostic capacity and veterinary clinical services

At present disease diagnostic of capabilities of DLS is limited. The DVHs, RFDILs and CDILs of DLS are constrained by lack of skilled manpower and modern analytical facilities. Therefore, support would be required to improve diagnostic capacity and veterinary clinical services of DLS, and to consider Community Health Worker approaches to address the lack of professionals. Key issue identified in AH NMTPP are in adequate diagnostic capacity and veterinary clinical services of DLS, lack of detailed

national strategies for control and eradication of priority diseases, inadequate production capacity of vaccines by DLS and need of capacity development of village farmers for disease prevention.

Capacity building of public-private seed supply

The current facilities in terms of infrastructure, laboratory, storage, field, trained manpower, etc. of public sectors for producing breeder seed, foundation seed, certified/TLS are seriously inadequate compared to the responsibilities set in seed regulations as well as national demand of quality seeds. Similarly the facilities developed by the private sectors for quality seed production and storage are so inadequate that except few seed companies, all are to depend on the services of public sectors. This is also applicable for production of fingerlings and support is also needed for brood stock management and production of quality seeds/fingerling for fisheries. Thus both public and private sectors are suffering seriously to produce and store quality seeds.

Promoting smallholder poultry and dairy development

Promoting small holder poultry and dairy development is important for agricultural diversification, poverty reduction food security and employment generation. It needs supports for (i) quality feeds and chicks at affordable price, (ii) promoting HYV fodder production, (iii) supply chain development through group marketing, (iv) processing and value addition and (v) community based vaccination program. (vi) dissemination of livestock and poultry technologies and (vii) strengthening training, demonstration and publicity.

3.3 Sustainable Management of Natural Resources

Promoting sustainable natural resource management policy and practices

Food policy emphasized the need for better agricultural research and extension programs and use and management of water and land resources properly to increase food production. In this line of actions MoA strategy calls for agriculture to enhancing growth through development and dissemination of sustainable use of natural resources (land, water, forest, climate) with appropriate technologies which are ecologically adaptable, economically profitable, and capable of generating productive employment, diversification of both crop and non-crop, development of agri-business services, efficiently water use in rice production and shift to water efficient food crops, cope with climate change, maintain ecological balance and conserve biodiversity.

Ensure sustainable water management practices for irrigation

Expansion of surface water irrigation has stagnated in recent years, largely due to reduction of trans-boundary water flows, shrinkage of wetlands, and reduction of base flow to the river. Underground water levels are also declining due to the expansion of use of shallow tubewells. Therefore, the scarce water resource needs to be used more efficiently and the irrigation cost to be reduced. Surface water for irrigation potential has not been fully utilized. By erecting rubber dams in the tributaries and developing water reservoirs, availability of surface water can be increased and irrigation coverage can be easily expanded up to 40 percent. Water use efficiency can be increased by constructing and developing efficient irrigation channels, cooperative water management system; thus, irrigation coverage can be increased and cost can be minimized from the existing irrigation facilities. Underground and surface water irrigation facilities are Government priorities, and

investment in improved distribution system, revival of rivers through dredging and construction of dams and barrages, enhancing drainage of water during monsoon and retention of water during dry season.

A more comprehensive approach is needed so as to enable Bangladesh to address issues such as how potential impact on salinity by increased retention of water in upper stream can be minimized and assess the potential for water reservoirs. In order to improve future inflows of rivers the scope for transboundary management of water resources should be studied and a policy framework needs to be developed for this purpose.

Expansion of minor irrigation through groundwater using DTWs and STWs was the vital component of the GoB's strategy to facilitate irrigation for agricultural development. STWs under private ownership played significant role for irrigation development during 1980s and there had been recorded sharp increase in number of these equipment During Third Five Year Plan (1985-90) continued emphasis on irrigation facilities tremendously increased groundwater irrigation through the use of DTWs, STWs and manually operated HTWs. Continued government support would be required to encourage participation of private sector in irrigation and water management.

Ensure efficient management practices on fertilizer uses

Also soil and water resource of Bangladesh is degrading due to imbalance use of fertilizers. Therefore, it is necessary to promote efficient management practices for balanced fertilization [and reduce pollution of soils and groundwater tables. Integrated pest management, composting of organic waste and waste water recycling should be promoted together with other practices that contribute to environment sanitation and healthier livelihood in rural areas.

Promoting conservation agriculture

It is a win-win system based on the integrated management of soil, water and agricultural resources. It would promote conservation agriculture with the aims to conserve and make more efficient use of natural resources through integrated management of available soil, water and biological resources combines with external inputs. It would contribute to environmental conservation as well as to enhanced and sustained agricultural production. It could be referred to resource- efficient and resource-effective agriculture. Some of the important conservation promoting agriculture practices are Integrated Crop Management (ICM), Integrated Pest Management (IPM), tillage, use of residual moisture, plantation of fodder trees and shrubs in the hill slopes.

Towards realizing the benefit from biotechnology and genetic modifications

The country can benefit from advances in biotechnology, but much needs to be done to make the bio-engineered products available in the appropriate forms for the farmers to use. Use of Biotechnology for agricultural improvement in the country is in the rudimentary stage. The Government established National Institute of Biotechnology (NIB) with a wide mandate but the institute is still in the development budget and does not possess the required facilities and manpower to deal with agricultural projects. The GoB developed biosafety guidelines and the National Biosafety Framework as a basis for the development of a regulatory regime for management of genetically modified organisms which needs to be operationalized to ensure public safety.

Conserving bio-diversity of inland water bodies

Utilization of open water resources for secondary purposes leading to the development of several infrastructures is causing a reduction, alteration and degradation of natural habitat and biodiversity.

In order to increase fisheries production, these encroachment of habitat destruction needs to be halted and developed for fisheries production. It is most crucial to maintain sanctuaries for the protection of indigenous species and for promoting open water stocking. Community based programs especially for public water bodies would be desirable.

Reversing genetic degradation in carp stock

The genetic degradation of local carp stocks is already having a deleterious effect on pond productivity and is growing ever more critical. It has been noted that there has been significant expansion of hatcheries in the country but they are not operating the hatchery under ideal conditions. Historically the hatcheries have not paid the necessary regard to selecting the brood stock they use to produce their fry. Often the last fish left in a pond are collected for use in hatcheries. Use of undersized and low quality brood stock affect yield of fish species. Besides, indiscriminate use of broods of same parental descendant is causing inbreeding, resulting in low yield of fish. There should be a carefully controlled and accredited breeding program to ensure that high quality brood stocks are maintained, collected and supplied to the hatcheries.

Development of appropriate breeding policy and scaling up of artificial insemination program for sustainable breed development

Government outlet for artificial insemination programmes is inadequate compared to the growing need of the country. Private sector may be entrusted with the AI program and the government program should be much more on quality control of breeding materials. It could be ensured by extending District AI centre with modern laboratory facilities to all districts.

Conserving forest through co-management practices and promoting opportunities of carbon financing

Forest resources are degrading very fast. The situation in the protected area is rather worst. Conservation of these resources through co-management practices with participation of local people need to be encouraged. There are some success cases of the Forest Department on co-management approach which need to be further scaled up in different protected forests. The capacity of the public sector agencies should be built up to enable them to assess the forest resources in order to qualify global carbon financing mechanism.

3.4 Increasing resilience to climate change and natural disasters risks

Bangladesh is a country most vulnerable to climate change and its agriculture is widely exposed to climate change risks. Climate proofing agriculture is absolutely central to addressing the vulnerabilities to Climate Change. Sustainable agriculture under worsening Climate Change scenario will at least in the near term depends heavily upon crops that can withstand higher temperatures and require much less water. New and novel seeds will be crucial in facing these challenges, however for rapid adaptation measures delivery of technology on the following areas are urgently required:

- Stress tolerant varieties;
- Drought tolerant varieties for Barind area;
- Salinity tolerant varieties for coastal area;
- Submergence tolerant varieties for flood prone and submergence prone area.

- Short duration varieties for late flood prone and Monga prone areas of Greater Rangpur district.

Beyond R&D on stress-tolerant varieties, building farmers' resilience to the potential / current threats of climate change is also important. In particular, Adaptation should be tackled as an integrated part of sustainable development, promoting inclusive and equitable capacity building and "no-regrets approach" such as adaptive practices and actions which will be beneficial even if future likely impacts. Focus actions can be on the following:

- Support data and knowledge for impact assessment and adaptation strategies;
- Support to national policy and legislative frameworks for climate change adaptation;
- Building Livelihood resilience to climate change – eg: sustainable land management such as land-use planning and soil and water management, and appropriate management of farming systems, livestock, forests, grasslands, fisheries and aquaculture;
- Promoting conservation and sustainable management of biodiversity;
- Developing and promoting innovative technologies, varieties and practices developed from local adaptation strategies and modern sciences;
- Promoting improved disaster risk management.

3.5 Greater R & D thrust for unfavourable eco-system in the Southern region

The potential of the southern region remain unexplored, although the bio-physical resource base provides diversified opportunities for integrated crop fish sand livestock farming. Investment plan with greater R & D thrust for unfavourable eco-system in the Southern Region will be required priority consideration. The opportunity of using surface water, developing salt and tidal tolerant crop varieties and using system approach for adapting suitable cropping pattern are to be harnessed.

Improving productivity of brackish water shrimp

Shrimp is produced less intensively in brackish water and productivity is very low compared to other Asian countries. Productivity can be improved through guidance to male and female shrimp farmers on how best to adapting better technology and scientific management. These require producing disease free seed, conserving brood stock and on farm improved disease management programme, etc. Also it is necessary to establish and strengthen shrimp disease diagnostic laboratories regionally and centrally at FRI.

Development of marine fisheries

Following measures needed for development of fisheries:

- Regular assessment of stock and proper monitoring of catch for effective regulation of the artisanal and trawl fisheries for sustainable production
- Development of techniques for exploitation of deep sea fisheries.
- Development of market infrastructure to reduce post-harvest loss

3.6 Promoting Agribusiness and market infrastructures

Public-Private partnership development in diversified vaccine production and marketing

Only small amount of vaccine is produced in the country by the public sector and the present status of vaccine production and marketing in Bangladesh is not developed. There is necessity to improve vaccine production and marketing system. But it needs huge investment which can be meet up with public private partnerships.

Promoting SMEs through Public-Private Partnership (PPP)

In this country SMEs play a key role in sustainable agriculture development and employment generation. Potential agro-based SMEs need to be developed based on local resources. It requires development of basic infrastructure for processing of agro-commodities; provision for training (skill training, upgrading of skills and Business Development training); research and Development of appropriate technology and its transfer; activities for fostering strong partnerships with chambers, associations/intermediary organizations and larger enterprises; provisions for adequate financial services for agribusiness (accessible and affordable interest rate). Quality awareness among the farmers/ producers to meet the taste and preferences of the consumer or the processing industries; development of information centre for agribusiness SMEs are pre-requisite. Identification of both local and export markets and carryout export promotion activities; creating alliances and recognition of the private sectors as vital development partner of government, donors and civil society organizations should be encouraged. The main activities should be the tapping the potential for development of youth and women entrepreneurship; and promotion of public-private partnership, capacity development of farmers, traders and GOB for Sanitary and phyto-sanitary standard.

3.7 Ensuring public food quality and safety

This would cover the following areas: a) Developing risk-based food control systems, b) Building up facilities for risk-based inspection, [accredited] testing & certification systems (domestic, imports and exports), c) Strengthening the coordination mechanisms between different departments (Ministry of Agriculture, Health, Industries, etc) with respect to food quality and safety, d) Developing Mutual Recognition / Equivalence Arrangements and Agreements with trading partners for both exports/ imports to ensure effective utilization of resources, e) Developing science based standards and food control activities, f) Developing a system for collection & sharing of surveillance data and their use in developing and implementing food control systems and risk communication, f) Developing a food safety emergency framework, g) Developing traceability and recall systems , h) Improving Awareness of various stakeholders including consumers on food safety and quality related issues, i) Technical support on implementation of risk-based management systems in SLDPs, including reduction of infections and food borne zoonoses.

3.8 Enhancing capacity in knowledge generation and management

Agricultural technologies so far developed do not capture much higher yields compared to yields of HYVs of two decades ago. Yield is more or less is in plateau. There are some frontier technologies that involve application of biotechnology and genetic modifications of traits. The NARS system neither has the necessary infrastructure to carry on research on different thrust areas nor the trained required manpower. In order to develop appropriate technology and enhance productivity of both males and females increased support for R & D in frontier agricultural research will be required for crops, fish, livestock and forest. Specifically efforts are needed in education of research staff and

technicians, establishing on-farm demonstration trials, information and communication systems to improve knowledge access, sharing, and collaboration, institutional capacity development in research management, cost/benefit analysis of research investments and sustainable finance mechanism for agricultural R&D.

3.9 Establishing pluralistic extension system

Strengthening mainstream extension approach of DAE, DLS and DOF and improving extension delivery at grassroots level

Linkages between research, extension, farmers' and other stakeholders of the agricultural innovation systems should be strengthened through institutional innovations that encourage networking among stakeholders. There is need of urgent review and reform of the existing public extension approach including DAE, DLS and DOF in order to foster better extension delivery with equitable access at grass root level.

Establishing ICT in agriculture

Many private sector agencies, mass media, call centre, etc are using ICT for agro-technology transfer and market information system. The public sector agency like AIS is also pro-active in dissemination of technology through ICT. Government should promote ICT use and also should provide standard guidelines for preparation of different technology modules in order to ensure quality delivery of information to the farmers.

Matrix 1 Relationship of CPF Thrust Areas with national planning process, relevance to FAO, UNDAF and CIP

CPF Thrust areas	Outcomes / Major priorities	Corresponding FAO SO	Relevance to national economic and social planning documents	Relevance to national MDG	Relevance to UNDAF 2006-2011	Reference to CIP Programmes
1. Reducing poverty and enhancing food security (access and utilization)	1. Capacity strengthening on food security and agricultural development policies. 2. Opportunity creation for in-farm and off-farm pro-poor employment generation. 3. Market intervention for sustainable access to essential food items, including scaled-up safety net programmes. 4. Enhancing food utilization and household nutritional status. 5. Enhancing women's participation in agricultural activities and entrepreneurship development.	G. Enabling environment for markets to improve livelihoods and rural development. H. Improved food security and better nutrition. K. Gender equity in access to resources, goods, services and decision-making in the rural areas. I. Improved preparedness for, and effective response to, food and agricultural threats and emergencies.	- The NSAPR II addresses the issues of poverty reduction and equity simultaneously, including: (i) bringing vibrancy in agriculture and rural life with the strategy of enhancing productivity and efficiency; (ii) expanding the social safety nets for the ultra poor; and (iii) targeted approach towards employment generation. - Particular attention has been put on mainstreaming food security concerns in NSAPR II. Food security is identified as a key goal under PRSP strategic block on "Critical sectors for pro-poor economic growth" (Strategic Block II – Rural Development). - Supportive of NFP and NFP Plan of action (2008-15) and Perspective Plan 2010-2021: - Reduce unemployment rate to 6% by 2021. - Reduce poverty to 14% by 2021. - Generate per capita income of about $ 1100 by 2015 and $1800 by 2021.	MDG 1 – Poverty and Hunger MDG 3 – Gender Equality This is supportive of the goal of poverty and food security (MDG1), and of promoting gender equality and empower women (MDG3). Targets: - Halving the number of undernourished people by 2015.	Outcome 3. Education and Pro-Poor Growth Outcome 2- Health Nutrition and Sustainable Population. Outcome 5 - Gender Equity and Advancement of Women Outcome 4 - Social Protection and Disaster Risk Reduction	P-6 Access to markets, improved agricultural value added, increased non farm incomes P-7 Capacity strengthening to formulate and implement food policies and related investments P-8 Enhanced public food management systems P-9 Development of an integrated multiyear safety net programme.

CPF Thrust areas	Outcomes / Major priorities	Corresponding FAO SO	Relevance to national economic and social planning documents	Relevance to national MDG	Relevance to UNDAF 2006-2011	Reference to CIP Programmes
2. Increasing food availability through increased farm productivity and agricultural diversification	1. Yield gaps reduced in targeted areas. 2. Increased access to technologies in crop, fisheries, livestock and forestry 3. Increased production of high value agricultural commodities (crops, fish, livestock and forest) 4. Promoting smallholder poultry, dairy and fisheries development	A, B, C: Increased Sustainable production of crop, livestock, fishery F. Sustainable management of land, water and genetic resources and improved responses to global environmental challenges affecting food and agriculture	- Supportive of NSAPR II goal of enhancing productivity, NFP and NFP Plan of action (2008-15), and Perspective Plan 2010-2021. - POA take action agenda with a target to increase production of high value crops by 25% and with introducing modern varieties of maize, pulses, oil seeds, vegetables and fruits and scaling-up ongoing programs of fish, poultry and livestock production.	MDG 1 – Poverty and Hunger MDG 4 – Child Mortality MDG 5 – Maternal Health	Outcome 3. Education and Pro-Poor Growth	P-3 Supply and sustainable use of agricultural inputs. P-4 Fishery development programme P-5 Livestock development programme
3. Sustainable management of natural resources:	1. Soil health protected in environmental stress prone areas. 2. Agricultural land losses reduced in most vulnerable areas. 2. Ensure efficient management practices for irrigation and fertilizer uses 3. Promoting sustainable natural resource (Land, water, forest and climate) management policy and practices	F. Sustainable management of land, water and genetic resources and improved responses to global environmental challenges affecting food and agriculture. E. Sustainable management of forests and trees.	- Supportive of NSAPRII, NFP and NFP Plan of action (2008-15) . - The Perspective Plan 2010-2021 set the goal to expand irrigation in greater Sylhet and South-West region and to increase irrigation efficiency to 70% from current 30%.	MDG 1 – Poverty and Hunger MDG 2 – Primary Education MDG 7 – Environmental Sustainability	Outcome 4 - Social Protection and Disaster Risk Reduction Outcome 3. Education and Pro-Poor Growth Outcome 2- Health Nutrition and Sustainable Population.	P-1 Integrated research and extension to develop sustainable responses to climate change P-2 Improved water management and infrastructure for irrigation purposes
4. Increasing resilience to climate change and natural disasters risks	1. Improved knowledge of climate proofing agriculture 2. Development of climate resilience farming system 3. Rural livelihoods in vulnerable areas are more resilient to	F. Sustainable management of land, water and genetic resources and improved responses to global environmental	- Supportive of NSAPRII, NFP and NFP Plan of action (2008-15), and Perspective Plan 2010-2021. - The GoB has been placing increased emphasis on the reduction of human, economic	MDG 1 – Poverty and Hunger MDG 2 – Primary Education	Outcome 4 - Social Protection and Disaster Risk Reduction Outcome 3. Education and Pro-	P-1 Integrated research and extension to develop sustainable responses to climate change P-2 Improved water management and

CPF Thrust areas	Outcomes / Major priorities	Corresponding FAO SO	Relevance to national economic and social planning documents	Relevance to national MDG	Relevance to UNDAF 2006-2011	Reference to CIP Programmes
(Contd Increasing resilience to climate change and natural disasters risks)	disasters and climate change impacts. 4. Increased resilience of vulnerable populations to climate change and natural disasters	challenges affecting food and agriculture. E. Sustainable management of forests and trees. Also D. improved quality of safety of foods at all stages of the food chain. I. Improved preparedness for, and effective response to, food and agricultural threats and emergencies.	and environmental costs of disasters, through enhancing the national capacity for disaster mitigation. - NFP PoA calls for strengthening the effectiveness of existing post-disaster rehabilitation programs in agriculture.		Poor Growth	infrastructure for irrigation purposes
5. Greater R & D thrust for unfavourable eco-system in the Southern region	1. Building R & D capacity to accelerate technology generation for the Southern Region. 2. Improving cropping intensity and enhance productivity.. 3. Improving productivity of brackish water shrimp**.**	Cross cutting: A, B, C, H, I, L Increased public and private investment in agriculture and rural development.	- Supportive of NSAPRII, NFP and NFP Plan of action (2008-15), and Perspective Plan 2010-2021. - Sustainability has been effectively mainstreamed into the NFP agricultural policy agenda for enhancing food supply and also biodiversity.	MDG1 – Poverty and Hunger MDG 7– Environmental Sustainability	Outcome 3. Education and Pro-Poor Growth Outcome 4 - Social Protection and Disaster Risk Reduction Outcome 2- Health Nutrition and Sustainable Population.	P-2 Improved water management and infrastructure for irrigation purposes P-1 Integrated research and extension to develop sustainable responses to climate change P-3 Supply and sustainable use of agricultural inputs P-4 Fishery development programme P-5 Livestock development programme

CPF Thrust areas	Outcomes / Major priorities	Corresponding FAO SO	Relevance to national economic and social planning documents	Relevance to national MDG	Relevance to UNDAF 2006-2011	Reference to CIP Programmes
6. Promoting agribusiness and market infrastructure **(Contd Promoting agribusiness and market infrastructure)**	1. Supply chain development of farm products (crops, fisheries and livestock) 2. Promoting SMEs through Public-Private Partnership (PPP) 3. Capacity development for sanitary and phyto-sanitary standard 4.Diversified vaccine production and marketing developed through partnership development 5. Processing and value addition of farm products (crops, fisheries and livestock)	G. Enabling environment for markets to improve livelihoods	- In line with the agricultural-led growth approach to food security adopted by the NFP, - The PoA emphasizes an integrated approach geared towards removing the major constraints on agro-based and rural MSME sector development.	MDG1 – Poverty and Hunger Support community self-help, social protection and safety nets, and develop options that are suitable to different groups and deliver efficient and effective services).	Outcome 3. Education and Pro-Poor Growth	P-6 Access to markets, improved agricultural value added, increased non farm incomes
7. Ensuring public food quality and safety	1. Promote food quality and safety measures 2. Reduction of food borne diseases	D. Improved quality and safety of food at all stages of the food chain. H. Improved food security and better nutrition.	- Emphasis is given in NFP PoA on food quality, safety and nutrition security	MDG 1– Poverty and Hunger	Outcome 2- Health Nutrition and Sustainable Population.	P-10 Community based nutrition activities through livelihood approaches P-11 Orient food and nutrition actions through updated data P-12 Food safety and quality improvement

CPF Thrust areas	Outcomes / Major priorities	Corresponding FAO SO	Relevance to national economic and social planning documents	Relevance to national MDG	Relevance to UNDAF 2006-2011	Reference to CIP Programmes
8. Enhancing capacity on knowledge generation and management	1. Increasing investment in agricultural research and capacity building of public and private sector institutions 2. Increased support for frontier agricultural research including biotechnology.	L. Increased and more effective public and private investment in agriculture and rural development F. Sustainable management of land, water and genetic resources and improved responses to global environmental challenges affecting food and agriculture.	- The NFP PoA calls for strengthening research to introduce modern technologies in crop and non-crop sectors. It also supports for increased investment in research (both crop and non-crop) to upgrade research facilities and enhance the skills of the scientists involved in research.	MDG 1– Poverty and Hunger Eradicating hunger and poverty by targeting agricultural development for marginal and small farmers who constitute the majority of the poor and hungry.	Outcome 3. Education and Pro-Poor Growth	P-3 Supply and sustainable use of agricultural inputs. P-6 Access to markets, improved agricultural value added, increased non farm incomes
9. Establishing pluralistic extension system	1. Strengthening mainstream extension approach including DAE, DLS and DOF 2. Capacity Development for provision of reliable statistics for evidence based policy making and planning.	H, Improved food security and better nutrition. L Increased and more effective public and private investment in agriculture and rural development. A, B, C. Increased Sustainable production of crop, livestock, fishery. F. Sustainable management of land, water and genetic resources and improved responses to global environmental challenges affecting food and agriculture.	- The NFP PoA calls for strengthening extension to introduce modern technologies and actively promote their dissemination through need-based extension service in crop and non-crop sectors.	MDG1– Poverty and Hunger	Outcome 3. Education and Pro-Poor Growth	P-1 Integrated research and extension to develop sustainable responses to climate change

Matrix 2 Major priority thrust, focused activities and implementation for multilateral cooperation

CPF Thrust areas	Outcomes / Major priorities within thrust	Outputs / Focussed activities	Performance indicators	Responsible Ministries & agencies	Risk and assumption
1. Reducing poverty and enhancing food security (access and utilization)	1. Capacity strengthening on food security and agricultural development policies. 2. Opportunity creation farm (crop fish and livestock) and off-farm pro-poor employment generation. 3. Market intervention for sustainable access to essential food items, including scaled-up safety net programmes. 4. Enhancing food utilization and household nutritional status. 5. Enhancing women's participation in agricultural activities and entrepreneurship development.	1. Support to targeted investment and policy support for creation of job opportunities from Livestock, fishery, seed & nurseries and agribusiness etc. enterprises 2. Targeting all type of common property land resources like wet lands, forest, hills and public utility places, road/railways etc. for pro-poor community employment generation through agro-based productivity enhancement 3 Promote investments in non-farm activities. 4. Technical support to GoB to ensure adequate public food grain stock for sustainable food security 5. Support for integrated farming systems oriented to assuring household food security (utilization) based on a variety of foods that will meet total dietary (including micronutrient) needs. 6. Support to scale up the safety net programmes to reach the most vulnerable. 7.support to mainstream gender dimonseion into food security policies and programmes for food security and nutrition 8. Support incorporation of nutrition education and training on food based	1. Amount of invest made & # of program implemented 3. Amount invested in non-farm activities for poverty reduction 4. Size of public foodgrain stock maintained 5. # of crop diversification programmes & bio-fortified food marketed 6. Increased # of vulnerable groups targeted in Safety Nets programmes 7. Entrepreneurship developed & # of women employed 8. # of programmes in food security with gender dimension. 9. Number of community - based nutrition education programmes established.	1. MOA, MOFL, DAE, DLS, DOF, development partners 2. MOL, LGED, MOA, MOFL, DAE, DLS, DOF, Development partners 3. MOI, LGED, MWA, DAM, MOF, BB, NCBs, PKSF, NGOs, Development partners 4. MOA, MOFDM, MOC, DAE, FPMU, DG Food, FAO, other development partners 5. MOA, MOFL, MOFDM, MOH, Development partners 6. MOFDM, FPMU, Department of Food 7. MOA, MOFL and MOFDM 8. MOA, MOFL, MOFDM, MOH and MOE	**Risk:** Political instability, global and national economic recession & natural disaster **Assumption:** Increased participation of development partners & enhanced pro-poor investment Needed safety nets programmes keep receiving support from GoB and Development Partners.

CPF Thrust areas	Outcomes / Major priorities within thrust	Outputs / Focussed activities	Performance indicators	Responsible Ministries & agencies	Risk and assumption
		approaches to nutrition 9. Capacity development of extension services			
2. Increasing food availability through increased farm productivity and agricultural diversification	1. Yield gaps reduced in targeted areas. 2. increased access to technologies in crop, fisheries, livestock and forestry 3. Increased production of high value agricultural commodities (crops, fish, livestock and forest) 4. Promoting smallholder poultry, dairy and fish development	1. Support to expanding demonstrations of technological packages for different crops, fisheries, livestock to minimize yield gaps 2. technical and normative support to public and private sector in increasing the availability and dissemination of agricultural inputs 3. Human Resources Development 4. Zoning of production potential of different high value agricultural commodities & provide needed R & D supports 5. Strengthen veterinary diagnostic and clinical services for the smallholders 6. Support to tailored credit facilities to vulnerable beneficiaries for revamping productivity 7. Provide incentive package for rapid farm mechanization	1. # of different types of programmes for the reduction of yield gaps. 2. # & types of programmes, Physical facilities created, # of HRD programmes undertaken 3. Zoning done 4. Status report 5. Facilities created & # of beneficiaries 6. Amount disbursed & # of beneficiaries 7. Status Reports	1. MOA, DAE, DLS, DOF, NGOs & development partners 2. MOA, DAE, BADC, DLS, DOF, Hortex Foundation, Dept of Forest and development partners 3. MOA, DAE, DLS, DOF, NARS & development partners 4. MOI, BFA, MOA, DAE, DLS, DOF, BADC, NGOs & development partners 5. MOFL, DLS, NGO, private sector, & development partners 6. MOF, BB, RKUB, NCBs, PKSF, NGOs, private sector & development partners 7. MOA, MOI, MOF, BB, RKUB, NCBs, NGOs, private sector & development partners	**Risk:** Outbreaks of disease and pest, environmental hazards, uncertainty in input & output prices **Assumption:** Increased generation and dissemination of improved technologies, enhanced investment & incentive packages for increasing productivity Fertilizer, electricity, diesel, fodder, quality feed, chicks, AI services are available at affordable prices
3. Sustainable management of natural resources:	1. Soil health protected in environmental stress prone areas. 2. Agricultural land losses reduced in most vulnerable areas.	1. Encouraging conservation agriculture, conservation tillage, soil moisture harvest and increased productivity of rainfed farming system 2. Promotion of compact township development in the rural areas	1. Increase in yield of non-irrigated crops increased 2. # of programmes implemented 3. # coverage of surface	1. MOA, DAE, NARS 2. MOA, MOL, LGED 3.MOA, DAE, BWDB,	**Risk:** Enhanced population density & faster degradation for natural resources, increased climate change threats

CPF Thrust areas	Outcomes / Major priorities within thrust	Outputs / Focussed activities	Performance indicators	Responsible Ministries & agencies	Risk and assumption
(Contd. 3. Sustainable management of natural resources)	2. Ensure efficient management practices for irrigation and fertilizer uses 3. Promoting sustainable natural resource (Land, water, forest and climate) management policy and practices	3. Reducing ground water mining while emphasizing maximum utilization of surface water irrigation practices 4. Promoting arsenic safe agriculture by reducing dependents on ground water harvest 5. Promoting practices for improving soil health and land productivity in environmental stress prone areas. 6. Encouraging balanced use of nutrient from organic and chemical fertilizers. 7. Conserving forest through co-management practices and promoting opportunities of carbon financing 8. Devoting water saving and cost reducing irrigation technology 9. Reversing genetic degradation in carp stock, basin planning and management and habitat restoration 10. Encouraging effective breed development policy and programme 11. Application of AEZ/GIS data base system agriculture development planning 12. Promoting ICM practices for bio safe food production 13. Stock assessment of marine fisheries	water irrigated agriculture 4. Arsenic irrigation water monitored 5. Types of practices & productivity indicator 6. Fertilizer use status report 7. # of programme implemented & # of carbon financing project prepared 8. Water saving technology in use 9. # & types of projects 10. Breed development policy implemented 11. Production planning exercises 12. # of projects 13. # & types of projects	MOWR, NGOs and development partners 4. MOA, DAE, BWDB, MOWR, NGOs and development partners 5. MOA, DAE, SRDI, NARS, NGOs and development partners 6. MOA, DAE, SRDI, NARS, NGOs and development partners 7. MOFE, Department of Forest, NGOs and development partners 8. MOA, DAE, SRDI, NARS, NGOs and development partners 9. MOFL, DOF, FRI and development partner 10. MOFL, DLS, Agricultural universities and development partners 11. MOA, SRDI, DAE and development partners 12. MOA, DAE, NARS & development partners 13. MOFL, DOF and FRI	**Assumption:** Knowledge based capacity of all user group will be increased, better scientific practices of production technique would be followed
4. Increasing resilience to climate change and natural disasters risks	1. Improved knowledge of climate proofing agriculture 2. Development of climate	1. Developing livelihood adaptations to climate change and mitigation practices through climate proofing agriculture 2. Integrating climate change adaptations	1. # of trained system analysts & experts 2. Coping strategies	1. MOA, NARS, agricultural universities and development partners 2. MOA, MOFL, MOFE, DAE,	**Risk:** Higher intensity of disasters, increased population in fragile ecosystems.

CPF Thrust areas	Outcomes / Major priorities within thrust	Outputs / Focussed activities	Performance indicators	Responsible Ministries & agencies	Risk and assumption
(Contd. 4. Increasing resilience to climate change and natural disasters risks)	resilience farming system 3. Rural livelihoods in vulnerable areas are more resilient to disasters and climate change impacts. 4. Increased resilience of vulnerable populations to climate change and natural disasters	and mitigation into farmers field school curricula 3. Disaster preparedness and coping strategies for climate change relating hazards 4. Support to develop in-country capacities of the modeller/system analyst to generate alternate scenario for future development plans 5. Enhancing support to accelerate the development of salt, drought and submergence tolerance crop varieties for different growing periods 6. Development of breeds / broods/ varieties / saplings for climate change resilience farming system 7. Strengthening regional cooperation for agricultural risk management and climate change threats 8.Climate change and disaster response capacity developed at community level in emergency response, early recovery, planning and accelerated investment in rural livelihoods 9. Knowledge base and community level awareness enhanced on the impact of climate change, including gender sensitive disaster risk reduction through improved extension and communication 10. Disaster risk reduced through integration of climate change adaptation into agriculture, land and water management	developed 3. Types of mitigation practices & # of climate school 4. Varieties, breeds, broods developed 5. Climate resilient farming practiced 6. # of beneficiaries 7. # of regional programmes	DLS, DOF, Department of Forest and development partners 3. MOA, MOFL, MOFE, DAE, DLS, DOF, Department of Forest and development partners 4. MOA, DAE and NARS 5. MOA, DAE and NARS & development partners 6. MOA, MOFL, MOFE, DAE, DLS, DOF, Department of Forest and development partners 7. MOA, MOFE, SARC, ERD, and development partners 8. MOA, MOFDM, FPMU, MOE & development partners 9. MOA, MOFL, DAE, DOF, DLS 10. MOA, MOFL, DAE, DOF	**Assumption:** decrease in global greenhouse gas emission, global compensatory package would be available, national management capacity will improve, better structured solution would be provided.

CPF Thrust areas	Outcomes / Major priorities within thrust	Outputs / Focussed activities	Performance indicators	Responsible Ministries & agencies	Risk and assumption
5. Greater R & D thrust for unfavourable eco-system in the Southern region	1. Building R & D capacity to accelerate appropriate technology generation for the Southern Region. 2. Improving cropping intensity and enhance productivity.. 3. Improving productivity of brackish water shrimp**.**	1. Increased support for infra structure development for sustainable use of surface water in agriculture 2. Develop salt and tidal tolerant crop varieties and fish species 3. Application of system approach for adapting suitable cropping pattern and better management practices to enhance productivity. 4. Improving productivity of brackish water shrimp through using better management of technology and disease control	1. Infrastructure built 2. Varieties developed 3. Increased cropping intensity & productivity 4. Productivity increased	1. MOA, DAE and NARS & development partners 2. MOA, MOFL, DOF, DAE and NARS & development partners 3. MOA, DAE and NARS & development partners 4. MOFL, DOF and FRI & development partners	**Risk:** Inadequate donor supports, sluggish technology generation **Assumption:** R & D capacity strengthened, surface water irrigation projects built.
6. Promoting agribusiness and market infrastructure.	1. Supply chain development of farm products 2. Promoting SMEs through Public-Private Partnership (PPP) 3. Capacity development for sanitary and phyto-sanitary standard 4.Diversified vaccine production and marketing developed through partnership development 5. Processing and value addition of farm products	1. Supply chain development of vegetables, fruits, fishes and livestock products through introduction of farmer's group marketing practices 2. Selecting suitable production zones of different commodities and to provide package benefits to boost export of agri products 3. Ensure adequate transportation services specifically air cargo for safe guarding value chain system of farm to fork 4. Promoting agro-based micro and SME enterprises in rural areas through Public-Private Partnership (PPP) 5. Supporting capacity development of Farmers, traders, and GOB officials for compliance of sanitary and phyto-sanitary standards, good agricultural practices, etc. 6. Support development of rural market	1. Group marketing practices established 2. Increased export 3. Air cargo transportation increased 4. # of programmes 5. Capacity build (both physical facility & HRD) 6. # of market & storage capacity developed 7. # of projects 8. # of types of SMEs covered 9. # of beneficiaries	1. MOA, DAE, MOFL, DLS, DOF, DAM, NARS, Agricultural universities & private sectors & development partners 2. MOA, MOC, DAE, DAM, private sector & development partners 3. MOTC, Civil aviation authority, private sector and development partners 4. MOA, DAE, DAM MOFL, DLS and DOF 5. MOA, DAE, DAM MOFL, DLS and DOF 6. MOA, DAM, MOFDS, LGED, Ministry of communication 7. MOA, Hortex Foundation, DAM, MOFL, DLS, DOF, MOI	**Risk:** Lack of appropriate investment, breakdown of export markets **Assumption:** Compliance capacity of SPS developed, PPP enhanced and market infrastructure development

CPF Thrust areas	Outcomes / Major priorities within thrust	Outputs / Focussed activities	Performance indicators	Responsible Ministries & agencies	Risk and assumption
		infrastructure, storage and communication system 7. Promote processing and value addition of vegetable, fruits, fish, meat, and milk. 8. Development of ICT for agribusin SMEs 9. Provisions for adequate financial services for agribusiness (accessible and affordable interest rate) 10. Developing a Market Information System (prices, market arrivals, quantities traded etc.)		8. MOA, DAM, and MOI 9. MOA, MOFL, BB 10. DAM and BBS	
7. Ensuring public food quality and safety	1. Promote food quality and safety measures 2. Reduction of infections and food borne diseases	1. Creation of analytical facilities and HRD development 2. Revisiting laws, policies and programmes on food safety 3. Public awareness building 4. Promote hygiene in food markets including slaughter house 5. Capacity development of producers	1. Facility created & # of persons trained 2. Laws a& Policies reformed 3. # of programmes under taken 4. Hygiene in the market improved	1. MOFL, MOA, DAE, DLS, DOF 2. MOFL, DLS, and BSTI 3. MOA, MOFL, DAE, DLS, DOF 4. MOA, MOFL, DAM, DLS, DOF	Risk: Failure of enacting law & its enforcement Assumption: PPP Capacity developed on food safety, implementation of revised laws
8. Enhancing capacity on knowledge generation and management	1. Increasing investment in agricultural research and capacity building of public and private sector institutions 2. Increased support for frontier agricultural research including biotechnology.	1. Support long term agricultural research program through increased investment and capacity development for research and research management in public and private institutions 2. Increased support in frontier agricultural research for crops, fish, livestock and forestry production 3. Support biotechnology research in crops, fish, livestock and forest for agricultural improvement and economic benefits	1. Capacity build (both physical facility & HRD) & amount invested in agricultural research and research management 2. . Number of research programmes and amount invested in frontier agricultural research for crops, fish, livestock and forestry 3. Number of research programmes and amount invested in biotechnology research in crops, fish, livestock and forest	1, MOA, MOFL, and NARS 2. MOA, MOFL, and NARS 3. MOA, MOFL, and NARS	Risk: Brain Drain out, poorly developed/maintained facilities in NARS Assumption: Increased investment in agriculture research availability of more skilled HR in the NARS, modern bio-tech lab are built and maintained

CPF Thrust areas	Outcomes / Major priorities within thrust	Outputs / Focussed activities	Performance indicators	Responsible Ministries & agencies	Risk and assumption
9. Establishing pluralistic extension system	1. Strengthening mainstream extension approach including DAE, DLS and DOF 2. Capacity Development for provision of reliable statistics for evidence based policy making and planning.	1 Reform of mainstream extension agencies for effective delivery of demand driven extension services targeted to all categories of producers 2. Establish effective research-extension linkage at the different tires of the national system 3. Improving coordinated extension services delivery at grass root level 4. Establishing ICT in agriculture	1. Mainstream extension agencies reformed 2. Effective research-extension linkage established 3. Established improved delivery of extension services at grass root level 4. Access to information and knowledge improved by extension staff and farmers through invested in ICT in agriculture	1. MOA, MOFL, DAE, DLS and DOF. 2. MOA, MOFL, DAE, DLS and DOF. 3. MOA, MOFL, DAE, DLS and DOF. 4. MOA, MOFL, DAE, DLS and DOF.	Risk: Slow reformation process, weak technology delivery, inadequate ICT facility Assumption: Main extension departments are reformed with better grass root delivery system and faster ICT capacity built.

Matrix 3. FAO niches and linkages with CPF challenges and priorities

Major challenges	Priorities for multilateral cooperation	FAO niches
1. A large proportion of the growing population (especially in rural areas) is food insecure	1. Poverty reduction and enhancing food security	Continue NFPCSP for enhancing food and nutrition security
2. Food production is not yet sufficient to satisfy the internal requirements and it is not sufficiently diversified	2. Increasing farm productivity and agricultural diversification	Contribute to ensure adequate availability of quality inputs in agriculture (crop, fisheries, livestock, forestry)
3. Unsustainable use of natural resources (land, water, forest, wetlands & biodiversity)	3. Sustainable management of natural resources	Promote small scale surface water irrigation activities and arsenic safe agriculture
4. Climate change threatens the stability of growth of agricultural sector	4. Increasing resilience to climate change and natural disasters risks	Continue tailored action-research programmes to support climate change adaptation Contribution to development of climate-related stress tolerant varieties (salinity, drought, ...) & climate resilient farming technology.
5. Poor development of the southern region	Greater R & D Thrust for unfavourable eco-system in the Southern region	Develop comprehensive master plan for agricultural intensification in the South. Building R & D capacity to accelerate technology generation for the Southern Region
6. inadequate access to market and provision of agricultural products fro poor farmers	6. Promoting agribusiness and market infrastructure	Capacity development for Sanitary and phyto-sanitary standard
7. poor capacities to monitor food quality and safety	7. Ensuring public food quality and safety	Creation of analytical facilities and HRD development Revisiting laws, policies and programmes on food safety Public awareness building Support to monitoring of zoonotic food borne diseases
8. Weak capacity of knowledge generation and management	Enhancing capacity on knowledge generation and management	Technical support to national research institutes. Strengthening national agricultural research, extension and agricultural research and technology information systems
9. Farmers have a insufficient knowledge on agricultural techniques due to a weak extension / research linkages	9. Establish a pluralistic extension system	Contribute to promote access and sharing of adequate knowledge and technologies for agricultural production Participatory extension assessment and planning Support to provision of agricultural production statistics.

Cross cutting: Little empowerment of women in diversified agricultural practices including agribusiness	1. Enhancing rural women's participation in agricultural activities, promoting women's entrepreneurship 2. Processing and value addition of farm products	Enhance women's participation in agricultural and entrepreneurship development programs

4. Implementation, Monitoring and Evaluation

4.1 Implementation mechanism

The CPF intends to be both a framework and a planning and management tool which will be implemented jointly by the Government of Bangladesh and FAO.

A **National Implementation Committee (NIC)** would be formed to monitor and oversee the implementation process. It would be co-chaired by the Secretary of MOA and the FAO Representative in Bangladesh, and will be composed of representatives from five ministries/departments and FAO-Bangladesh. The **NIC** will be the coordinating body to oversee the effective implementation of the CPF and take policy decisions. The function of this committee would be to periodically review the implementation process by different ministries, agencies and development partners and to provide strategic directions. Each participating ministry will refer to the CPF document during the development process of any projects or programmes supported by GOB or donors. FAO-Bangladesh shall widely circulate the document to all development partners working in Bangladesh and FAO shall activate the LCG members to participate in the implementation process. The FAO will report it back to the NIC for further action from different working ministries and agencies.

4.2 Process for incorporating relevant priorities in national planning processes

The CPF has been formulated with continuous consultations with the CPF Inter Ministerial Committee and other partners. Together with the **Plan of Action of the National Food Policy** (2008), the CPF has been used as a reference for the formulation of the **Bangladesh Country Investment Plan (CIP): a roadmap towards investments in Agriculture, Food Security and Nutrition** (approved by the GOB in June 2010, and updated in March 2011). The CPF has also been used as a reference for the formulation of the Draft **United Nations Development Assistance Framework 2012-2016**.

The CPF has been ultimately revised with comments from technical divisions of the FAO Headquarters and Regional Office for Asia and the Pacific (RAP). The CPF document has been submitted to the Interministerial Committee, chaired by the Secretary of MOA consisting of senior representatives of various line ministries, associated government institutions. The Ministry of Agriculture has endorsed the CPF in April 2011.

4.3 Process of project formulation and implementation

Upon the approval of the CPF document by the Government of Bangladesh, relevant projects / programmes will be identified and selected by the CPF Implementation Committee among the priorities agreed in the document. FAO will proceed with project formulation and fundraising, through FAO's regular budget (Technical Cooperation Projects - TCP) or through interested Development Partners (DPs). Liaison with DPs will be regularly maintained aiming to advocate for interventions and investments within the CPF's and other relevant GOB strategic documents' priority areas (including CIP, NFP/POA, UNDAF...) aiming to improve resource management and enhance results in the areas of food and nutrition security.

4.4 Review and adjustment

FAO, jointly with MOA, will prepare the annual progress report of the implementation of the CPF, which will be discussed at the annual CPF Implementation Review Workshop prior to its finalization. Matrix 4 here below can be used as a reference for the progress report.

The CPF implementation review workshop will be organized once every year to review and evaluate the effectiveness of the implementation and make necessary adjustments to the CPF document if required, with the participation of the members of the CPF Implementation Committee and the representatives of other concerned ministries and departments.

4.5 Progress monitoring and results assessment

The line ministry will submit a yearly report on the monitoring of implementation using the matrix 4 to the NIC which would function optimally for results based management if it includes gender-specific data and information. In order to monitor progress towards translating priorities into resource allocation and implementation of project matrix 4 could be used.

Matrix 4. Monitoring of the implementation process of CPF

CPF Priority	Project Title	Corresponding Targets and Objectives	Status and period of implementation	Amount	DP	GOB Counterpart	Remarks

It is necessary to gather information on ongoing and pipeline projects against each priority together with sources of fund and amounts invested. Periodical monitoring is required, with an annual update of the matrix 4 (submitted by FAO to MoA) and annual review accompanied by a brief report on the status of implementation. During the annual review the parties (MoA and FAO)could also propose revision in order to fine tune when required the matching between CPF and the national priorities. An initial review after approval will determine the resources needed per priority. A mid-term review will also identify the gaps between needed resources and invested resources. A final review will integrate recommendation for the way forward. The CPF will be considered by the parties as element of the comprehensive policy framework on food and nutrition security. Its implementation will contribute to the coherence of the GOB and FAO's interventions on the topic.

ANNEX 1 – Living Matrix. Monitoring of the implementation process of CPF – Status as of July 2010

Priorities	Projects formulated	Corresponding Targets and Objectives	Status of implem and period	Amount	Main C.terpart	Sources of Fund	Remarks
1. Poverty reduction & enhancing food security	Emergency 2007 Cyclone Recovery and Restoration Project (ECRRP)	- To introduce improved agricultural technologies to improve the resilience of communities and households.	2010-2013	16 M USD	MoA, MoFL	WB	
	EUFF – Support to Assist Landless, Marginal and Small Farmers to Overcome Soaring Input and Food Prices in Impoverished Areas of Bangladesh.	- To provide assistance in the crop, livestock and fisheries sectors, with a strong emphasis on agricultural modernization.	2010-2011	10 M USD	MoA	EC	
	NFPCSP – National Food Policy Capacity Strengthening Programme.	- Policy advice to the Government on food security and implementation of the National Food Policy and its POA.	2009-2012	10.7 M USD	MoFDM	EC, USAID	
	UN Joint Programme – Protecting and Promoting Food Security and Nutrition for Families and Children in Bangladesh.	To contribute to the reduction of acute malnutrition and to reduce the proportion of the population that is food insecure.	2010-2012	2.8 M USD	MoA	MDG-F SPA	
	Contribution to the organization of the Food Security Investment Forum	Formulation of the Country Investment Plan	2010-11		MoFDM		in collaboration with USAID, IFPRI and FAO
	Enhancing Nutrition and Livelihoods through School Milk Programmes Linked to Smallholder Dairy Operations		Under formulation				Regional TCP (Thailand, Myanmar, Bangladesh)
	Immediate Assistance to Restore the Livelihoods of Women and Fish Farmers Severely Affected by Cyclones in South-Western Bangladesh	Quick recovery of the fishery sector to reduce vulnerability of the rural population to food insecurity.	2010-11	0.85 M USD	MoFL	SPA	
	TA component of Integrated Agriculture Development Programme	improved food and nutrition security through more effective and inclusive design and implementation of investment programmes	2011-15	3.7 M USD	MoA, MoFDM, MoFL	GAFSP	
	Inter-priority (1,2,3,4,5): Master plan on southern delta for agricultural development	To create s system to support agricultural development in disaster prone southern coastal belt.	Under formulation	TBD	TBD	TBD	Cross priority – it embraces also priority 2, 3,4 and 5.

Priorities	Projects formulated	Corresponding Targets and Objectives	Status of implem and period	Amount	Main C.terpart	Sources of Fund	Remarks
2. Increasing farm productivity & agricultural diversification	OSRO/GLO/802/USA "Improved biosecurity and hygiene at production, collection points and live bird markets (LBM), including decontamination".			2.5 M USD	MOFL	USAID	
	OSRO/INT/805/USA "Developing and Maintaining Public-Private Partnerships for the Prevention and Control of Highly Pathogenic Avian Influenza H5N1 and other Emerging Infectious Animal Diseases.				MOFL	USAID	
	OSRO/RAS/605/USA "Immediate technical assistance to strengthen emergency preparedness for Highly Pathogenic Avian Influenza (HPAI)			2.6 M USD	MOFL	USAID	
	Technical assistance to strengthen emergency preparedness for highly pathogenic avian Influenza including active surveillance	- To provide technical assistance and support the active surveillance in 300 upazilas.	The project is in the hard pipeline.		MOFL	USAID	
	Livestock Health Care programme at Kotalipara and Tungipara Upazillas in the Gopalgonj District	Improving animal health in targeted Upazilas through technical assistance to DLS	Submitted for approval to RAP	0.47 M USD	DLS / MoFL	TCP	
	Inter-priority (1,2,3,4,5): Master plan on southern delta for agricultural development	To create s system to support agricultural development in disaster prone southern coastal belt.	Under formulation	TBD	TBD	TBD	Cross priority – it embraces also priority 1, 3, 4 and 5.
	Development of Agricultural Biotechnology capacities	Technical assistance on development of biotechnology – follow-up of the TCP 2008-2009		TBD	TBD	TBD	Submitted to donors
3. Sustainable management of natural resources	Improved Agricultural Practices for Sustainable Land Management in South Asia	To improve SLM towards increased adaptation of the agriculture sector to climate change		0.5 M USD (0.1 to BGD)		FAO/ TCP	Regional Project (Nepal, Sri Lanka, Bhutan, Bangladesh)
	Inter-priority (1,2,3,4,5): Master plan on southern delta for agricultural development	To create s system to support agricultural development in disaster prone southern coastal belt.	Under formulation	TBD	TBD	TBD	Cross priority – it embraces also priority 1, 2, 4 and 5.
4. Disaster risk	Livelihood Adaptation to Climate Change	- institutional capacity building.		TBD		TBD	

Priorities	Projects formulated	Corresponding Targets and Objectives	Status of implem and period	Amount	Main C.terpart	Sources of Fund	Remarks
management & building capacity of coping climate change risks		- increase of farmers resilience.					
	Inter-priority (1,2,3,4,5): Master plan on southern delta for agricultural development	To create s system to support agricultural development in disaster prone southern coastal belt.	Under formulation	TBD	TBD	TBD	Cross priority – it embraces also priority 1, 2, 3 and 5.
5. Greater R & D thrust for unfavourable eco-system in the Southern region	Inter-priority (1,2,3,4,5): Master plan on southern delta for agricultural development.	To create s system to support agricultural development in disaster prone southern coastal belt.	Under formulation	TBD	TBD	TBD	Cross priority – it embraces also priority 1, 2, 3, and 4.
	Seed Multiplication Farm		Under formulation			FAO/ TCP	
	Strengthening Mushroom Development project		Under formulation			FAO/ TCP	
6. Promoting agribusiness & market infrastructure	Food Security through Enhanced Agricultural Production, Diversified Sources of Income, Value Addition and Marketing in Bangladesh.	To identify and adopt new technologies and activities, identify and respond to related market opportunities, and obtain the financing required for investment to meet that demand.	2010-2013	3 M USD	MoA	ITA	
7. Ensuring public food quality and safety	Improving Food Safety, Quality and Food Control in Bangladesh		2009-2012	10.2 M USD	MoHFW	EC	
8. Enhancing capacity on knowledge generation & management	Assistance in the data processing and analysis of the Bangladesh census of agriculture.	To assist the finalization of the analysis of the agriculture census 2007	2010	0.165 M USD	BBS/ Planning	FAO/ TCP	
	Migration and food security	Rapid situation assessment of migration and remittances and their impact on food security.				TCP facility	
	Harmonizing the Agricultural Production statistics data for effective planning for Food Security		Under formulation	0.4 M USD	BBS and DAE	TCP	
9. Establishing pluralistic extension system	Enhancing rural communication services for agricultural development through community rural radio.	Improvement of the extension services and establishment of pilot community rural radio	2010-2011	0.475 M USD	MoA	FAO/ TCP	

ANNEX 2 – Synthetic Table – Matching CPF Thrust Areas with National and International Priorities

The main corresponding priorities are in bold, selected according to FAO-BD comparative advantages within the corresponding CPF thrust area, or the largest share of investment / technical assistance / emergency projects.

CPF Thrust areas	FAO-SO	UNDAF 2006-2011	UNDAF 2012-2016	CIP	MDG
1. Poverty reduction & enhancing food security	**H** G, K, I	**Outcome 3** Outcome 5 Outcome 4	**Pillar 4** Pillar 2	**P-7** P-6 P-9	**MDG 1** MDG 3
2. Increasing farm productivity & agricultural diversification	**A** B C	**Outcome 3**	**Pillar 4** Pillar 2	**P-3** P-4 P-5	**MDG 1** MDG 4 MDG 5
3. Sustainable management of natural resources	**F** E	**Outcome 4** Outcome 3 Outcome 2	**Pillar 5**	**P-1** P-2	**MDG 1** MDG 2 MDG 7
4. Disaster risk management & building capacity of coping climate change risks	**F** E, I	**Outcome 4** Outcome 3	**Pillar 5** Pillar 4	**P-1** P-2	**MDG 1** MDG 2
5. Greater R & D Thrust for unfavourable eco-system in the Southern region	Cross cutting: **A**, B, C, H, I, L	**Outcome 3** Outcome 4 Outcome 2	**Pillar 4**	**P-2** P-1 P-3, P-4, P-5	**MDG 1** MDG 7
6. Promoting agribusiness & market infrastructure	**G**	**Outcome 3**	**Pillar 2**	P-6	**MDG 1**
7. Ensuring public food quality and safety	**D** H	**Outcome 2**	**Pillar 4**	P-10 P-11 P-12	**MDG 1**
8. Enhancing capacity on technology generation & management	**L**	**Outcome 3**	**Pillar 2** Pillar 4	**P-1** P-3 P-6	**MDG 1**
9. Establishing pluralistic extension system	**H** L A, B, C	**Outcome 3**	**Pillar 2** Pillar 4	**P-1**	**MDG 1**

FAO Strategic Objectives

A. Sustainable intensification of crop production.
B. Increased sustainable livestock production.
C. Sustainable management and use of fisheries and aquaculture resources.
D. Improved quality and safety of food at all stages of the food chain.
E. Sustainable management of forests and trees.
F. Sustainable management of land, water and genetic resources and improved responses to global environmental challenges affecting food and agriculture.
G. Enabling environment for markets to improve livelihoods and rural development.
H. Improved food security and better nutrition.
I. Improved preparedness for, and effective response to, food and agricultural threats and emergencies.
K. Gender equity in access to resources, goods, services and decision-making in the rural areas.
L. Increased and more effective public and private investment in agriculture and rural development.

FAO Functional Objectives – Common to all areas:

X. Effective collaboration with Member States and stakeholders.
Y. Efficient and effective administration.

FAO Core Functions – Common to all areas:

a) Providing long-term perspectives and leadership in monitoring and assessing trends in food security and agriculture, fisheries and forestry.
b) Stimulating the generation, dissemination and application of information and knowledge, including statistics.
c) Negotiating international instruments, setting norms, standards and voluntary guidelines, supporting the development of national legal instruments and promoting their implementation.
d) Articulating policy and strategy options and advice.
e) Providing technical support to:
    - promote technology transfer;
    - catalyse change; and
    - build capacity, particularly for rural institutions.
f) Undertaking advocacy and communication, to mobilise political will and promote global recognition of required actions in areas of FAO's mandate.
g) Bringing integrated interdisciplinary and innovative approaches to bear on the Organization's technical work and support services.
h) Working through strong partnerships and alliances where joint action is needed.

Country Investment Plan – Programmes

	Component	Programme Title
1	**Food Availability**	P-1 Integrated research and extension to develop sustainable responses to climate change
2		P-2 Improved Water Management and Infrastructure for Irrigation Purposes
3		P-3 Supply and Sustainable Use of Agricultural Inputs.
4		P-4 Fishery Development Programme
5		P-5 Livestock Development Programme
6		P-6 Access to markets, improved agricultural value added, increased non farm incomes
7	**Food Access**	P-7 Capacity strengthening to formulate and implement food policies and related investments
8		P-8 Enhanced Public Food Management Systems
9		P-9 Development of an integrated multiyear safety net programme.
10	**Food Utilization**	P-10 Community based nutrition activities through livelihood approaches
11		P-11 Orient food and nutrition actions through updated data
12		P-12 Food Safety and Quality Improvement

UNDAF 2006-2011 – Outcomes

- Outcome 1- Democratic Governance and Human Rights: Human rights of children, women, and vulnerable groups are progressively fulfilled within the foundations of strengthened democratic governance.
- Outcome 2 - Health Nutrition and Sustainable Population: Survival and development rights of vulnerable groups are ensured within an environmentally sustainable framework
- Outcome 3 - Education and Pro-poor Growth: The most vulnerable groups have improved life conditions, skills, services, and decent job opportunities.

- Outcome 4 - Social Protection and Disaster Risk Reduction: Human security is strengthened and vulnerability to social, economic and natural risks are reduced
- Outcome 5 - Gender Equity and Advancement of Women: Societal changes are realized to reduce discriminatory practices and to pursue equity and empowerment for women and girls
- Outcome 6 - Prevention and Protection against HIV/AIDS: Increased ability of the country to understand and respond to the HIV epidemic.

UNDAF 2012-2016 – Pillars

Informed by the MDG analysis and the strategic priorities of the Government seven inter-related and mutually reinforcing UNDAF priority areas were selected.

- Pillar 1: Democratic Governance & Human Rights
- Pillar 2: Pro-poor Growth with Equity
- Pillar 3: Social Services for Human Development
- Pillar 4: Food Security & Nutrition
- Pillar 5: Climate Change, Environment, Disaster Risk Reduction & Response
- Pillar 6: Development of Urban Poor
- Pillar 7: Gender Equality & Women's Advancement

Since the MDG framework is fully incorporated into the national plans and strategies such as the Outline Perspective Plan and the Sixth Five Year Plan, the identified seven priority areas provide a fully integrated road map for development efforts. The following Government priorities very clearly demonstrate the linkages (i) Boosting Production, Income and Poverty; (ii) Securing Human Resource Development (iii) Improving Water and Sanitation; (iv) Building better Energy and Infrastructure, (v) Realizing Gender Equality and Empowerment; (vi) Promoting Environment Sustainability; and (vii) Better governance to defend rights & tenets of justice.

Millennium Development Goals

- Goal 1: Eradicate extreme poverty and hunger
- Goal 2: Achieve universal primary education
- Goal 3: Promote gender equality and empower women
- Goal 4: Reduce Child Mortality Rate
- Goal 5: Improve maternal health
- Goal 6: Combat HIV/AIDS, malaria, and other diseases
- Goal 7: Ensure environmental sustainability
- Goal 8: Develop a global partnership for development

ANNEX 3 – References

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