T OW to feed the rising population in the limited arable land? The increase in yield was phenomenal; as a result many of the deficit eountries turned into exporting ones. Mexico, Pakistan, India and the Philippines are cases in point. These HYVs gradually replaced low yielding indigenous varieties and land races. But how long would HYV's sustain the ever increasing hungry mouths? The situation has come to such a stage that even if the potentiality of HYVs is fully realized, the world's demand for conventional type of food crops won't be met. Besides, the present day superior performance of HYVs cannot be guaranteed, a fact which was felt when a particular type of virus called Tungto virus destroyed a sizeable rice crop throughout the Philippines. But by then a lot of local land races were gone for good - a situation which geneticists describe as "genetic"



Source: CGIAR.

erosion. This process of denudation is replacing large areas of lush forests throughout the globe in South East Asia. Middle East, Africa and Latin America countries. In Bangladesh, in the past to 25-30 years, 30-40 area from Madhupur forest has been denuded of forest plants and replaced with crops. The hill tops in and around Chittagong city are being cleared to build houses for dwelling purpose.

Suggestion for Creation of a Division/Department in Agricultural Institutes and Universities for Research in non-traditional Food Crops Because of the importance of enhancing world's food production, it is suggested that a division with two sections be created; one for collection, identification and selection of superior types of non-traditional food crops and the other for creating awareness among people about the food value of these crops. The second section will work in close collaboration with the extension department and get the feedback from them and work toward improvement of the food crops in respect, of their palatability by preparing suitable dishes. The mass media should also work through telecasting/broadcasting of programmes aimed at popularizing these non-traditional food

Use of Algal Material as Supplement to Every Day Diet In Japan and in some European countries some species of a algae are used to prepare dishes to go with every day meal. People are usually reluctant to take food items they are not used to. For this, campaigns supported by VDOs. regular radio and TV features need to be launched both at the

Government and NGO level.

Use of Indigenous Fish species to Supply Protein-rich Food to Common Man : During the last thirty years, the human population in Bangladesh has grown nearly three times, but the fish production has increased only by 2. Furthermore certain species of fish, such as kajoli, mola, tengra, batashi, punti, taki, pabda, dela, kulsha, kechki, are hardly found in the market indicating that they are endangered species. More than 100 edible species are available in Bangladesh, an ecological occurrence not seen anywhere else in the world. Through genetic population the local varieties can be developed to yield a sufficient quantity of fish and fish products to feed the entire population. Apart from local varieties being much more tastier than the exotic ones like tilapia, silver carp etc they will help maintain the ecological balance as well as ensure an adequate supply of precious fish protein for future genera-

Use of "Neem" extracts as a Biopesticide to save Fish and Plant Material from Getting Scarce: Concentrates from "neem" plants have proven to be a very potent and powerful agent to control a number of important pests and diseases including those caused by nematodes. Besides when "neem" is used with a small proportion

by Prof. Ahmad Shamsul Islam of a chemical pesticide, it proves very effective in curbing virulent pests not amenable to control by the chemical insecticide alone. Besides it is a repellant of insects as well as it protects stores grains from being damaged by pests. The sooner. biopesticides are introduced. the better for conservation of biodiversity.

> Importance of wild animal species in breeding disease/pest resistant strains : In certain parts of Chittagong. namely, Naikhongchori, Bandorbon, a semi-wild race of cows called "Gayal" are available and is immune to the diseases which kill exotic breeds, such as Shahiwal, Friesian hybrids. "Gayal" has however one great disadvantage: it has rudimentary udder. By means of gene manipulation, it may be possible for mapping gene (s) responsible for resistance to diseases in "Gayal"; after the identification of gene (s), one could introduce disease resistance gene (s) to the improved breeds for combining higher lactation with disease resistance traits.

> In Bangladesh and for that matter in most of the developing countries of the world where people are suffering from protein deficiency diet, biotechnology programme of this nature is urgently needed so that the quality of protein in grain legumes can be enriched through insertion of suitable gene (s) from sunflower, chicken egg etc.

> Introduction of suitable themes in science curricula: Science syllabus in all classes from I-XII should be redesigned to include chapters on different aspects of environment. Students should be encouraged to move around their neighbourhood and see living objects - plants, animals, birds and reptiles for themselves. This exercise will help them appreciate nature's biodiversity.

Observance of World's Food Day of this year's theme will bear fruit only if we create awareness among people at all levels for keeping their hands off from forest resources without first ensuring that such an action would not unbalance sustainability. Only then will people no matter where they live have two square meals a day, a roof over their heads and access to basic health care and education.

The writer is a former Professor of Botany at the University of Dhaka and recipient of 'Ekushe Padak' in education. His field of specialisation is plant biotechnology on which he has written several books.



The Daily Star

October 25, 1993



Biodiversity is a popular way of describing the diversity of life on earth: it includes all life forms and the ecosystems of which they are a part. World Food Day (WFD) - the anniversary of FAO's founding on 16 October 1945 celebrates, in particular, that part of biodiversity that nurtures people and contributes to long-term foodsecurity for all. Biodiversity forms the foundation for sustainable development. It is the basis for the environmental health of our planet and the source of economic and ecological security for future generations. Given the importance of the WFD, although belated, The Bails Star brigns out special feature with special reference to Bangladesh.

Harvesting Nature's Diversity

TT 7 E are losing biological diversity at an unprecedented rate. The loss of species is not new. In the course of geological time one has only to recall the fate of the dinosaurs. By and large, however, the disappearance of species in past eras has occurred by virtue of natural processes within the context of evolutionary time-scales. Today, however, human activities contribute more to the loss of biodiversity than any other fac-

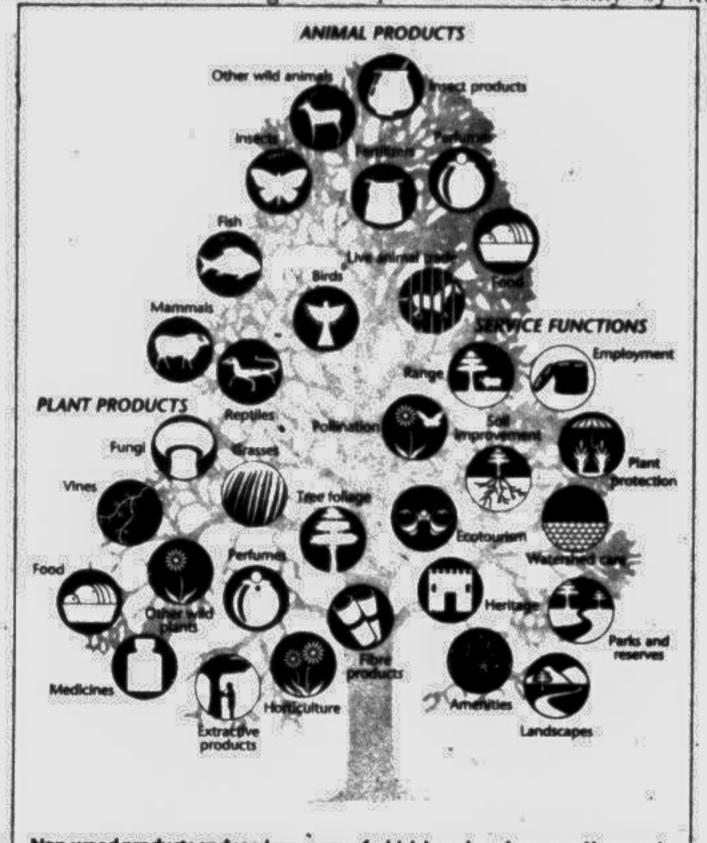
Biological resources are renewable resources, but they are being exploited at rates that exceed their sustainable yield. Human destruction of habitats, whether exploited for commercial or subsistence reasons, is the greatest threat. The clearing of land for agriculture, overgrazing of grasslands, cutting and burning of forests, unsustainable logging and fuelwood collection, indiscriminate use of fertilizers and pesticides, overwatering of crops, overexploitation of fisheries, draining and filling of wetlands, poor water management, urbanization and pollution of air and water, figure prominently in the degradation of our biological resources. Five to seven million hectares of cultivated land are destroyed every

Genetic erosion - the reduction of diversity within and the main cause of extinction of a species - is a global threat to agriculture. The greatest loss of crop genetic resources results from the introduction of modern, uniform plant varieties in place of a mix of traditional ones. The Green Revolution introduced high-yielding varieties of rice and wheat to the developing world, but displaced traditional varieties and their wild relatives on a massive scale.

The same is true of animal genetic resources. The introduction of a very few modern breeds that are better suited for the high input-output of indusby Hope Shand

trial agriculture is displacing the diversity of indigenous livestock breeds. In Europe, half of all the breeds of domestic animals (horses, cattle, sheep, goats, pigs and poultry) that existed at the beginning of the century have become extinct. A third of the remaining 770

ments and growing conditions. The ability of a particular variety to withstand drought or inundation, grow in poor or rich soil, resist one of the many insect pests or diseases, give higher protein yields or produce a better-tasting food are traits passed on naturally by its



Non-wood products and services, many of which have long been used by people living in and around forests, are increasingly appreciated as a source of sustainable development, Many food crops and industrial, commercial and pharmaceutical products originated as non-wood forest products. The economic and social incentives provided by non-wood forest products encourage conservation and offer a defence against the loss of biodiversity.

breeds are in danger of disappearing within the next 20 years.

Why is biodiversity important?

Genetic diversity in agriculture enables crops and animals to adapt to different environ-

Diversity among individual plants and animals, species and ecosystems provides the raw material that enables human communities to adapt to change - now and in the future.

Deprived of biodiversity, the

the challenges resulting, for example, from global warming and ozone depletion would be severely limited. The diversity found within the small number of plant and animal species which form the basis of world agriculture and food production remains small but vital part of the earth's biodiversity. Through modern biotechnologies wild diversity can also be incorporated into crops and contribute to world agricultural development.

ability of humankind to meet

Biodiversity for sustainable development

The biological resources of each and every country are important, but not all are equally endowed. In general, a small number of countries lying within the tropics and subtropics account for a very high percentage of the world's biodiversity. Tropical forests, for example, cover only 7 percent of the earth's land surface, but they are estimated to contain at least 50 percent of all species.

The most important food crops, however, appear to have originated in areas that have pronounced seasons, not in the tropical forests. This tends to coincide with arid and semi-arid zones, which include famineprone countries such as Ethi-

The fact that the richest nations are home to the smallest pockets of biodiversity while the poorest are stewards of the richest reservoirs underscores the interdependency of all nations, and the urgency of crafting common strategies for sustaining biodiversity that share both responsibility and benefits. On the eve of the twenty-first century, the challenge for the global community is not to save biodiversity for its ownsake, but to ensure that biodiversity is used sustainably and equitably for human development.

The writer is associated with the WFD Secretariat, FAO.

Review of Past Trend and Future Outlook

Food Production in Bangladesh

The Daily Star 8

by Quazi Shahabuddin

GRICULTURE predominates Bangladesh's economy and the crop sector accounts for about threefourths of the value added in agriculture. Although the share of agriculture in the economy has been declining, yet the role of crep sector in providing income and employment to the population as a whole remains critical. Practically, all cultivable land in Bangladesh is in use and there is little scope for expanding the land frontier. The pressure of increased population reduced the average farm size from 1.43 to 0.91 ha over the last decade. Nearly four-fifth of the tetal land are allocated to the staple foodgrain, rice. In fact, rice, wheat, potato and pulses account for more than 45 per cent of the total cropped land in Bangladesh.

Trend in Food Production

Table I shows that the production of all the major foodgrains increased during the last two decades. Output of the rice

It is clear from Table 1 that although all the major food crops experienced growth in output during the last two decades in general, their growth performance during the sub-periods varied substantially. Some experienced ever increasing growth, others declining and for still others a fluctuation from one period to the other was observed. It may further be concluded that the production of major food crops (except wheat) is picking up as shown by the higher growth rates for the late eighties compared to the trend rates of growth in general for the other sub-periods.

Future Outlook

Bangladesh appears to be self sufficient in cereals in both economic sense (domestic demand equals domestic supply with prices, determined competitively approximating border price) and the normative sense that the equilibrium quantity is. on average, nutritionally ade-

Bangladesh appears to be self sufficient in cereals in both economic sense (domestic demand equals domestic supply with prices, determined competitively approximating border price) and the normative sense that the equilibrium quantity is, on average, nutritionally adequate. This does not, of course, mean that access to food is equitable.

on an average increased at around 2.50 per cent per year during this period. Growth rate of rice production declined to 2.13 per cent per year in the eighties (1981-90) from 2.79 per cent in the seventies (1971-80). But it can be noted from the table that the annual growth rate for the late eighties (1986-90) of 3.16 per cent is even higher than that for the seventies. Hence, it is clear that there was a substantial declaration in the growth of rice production during the early eighties.

Acreage of rice increased marginally at around 0.6 per

quate. This does not, of course, mean that access to food is equitable. According to 1988-89 Household Expenditure Survey, while the average consumption of rice was 0.44 kg per day, for the bottom 20 per cent of the population, it was 0.31 kg per day, and for the top 10 per cent, 0.51 kg per day. Clearly, food security and foodgrain self-sufficiency are not identical.

A number of attempts have been made to project demandsupply balance of foodgrain over the medium and the long term i. e. by the end of this century and beyond. The outcomes dif-

Table 1

Growth Rate of Output of Major Food Crops Food/period 1971-90 1971-80 1981-90 1986-90

(per cent per annum Rice 2.49 2.79 2.13 3.16 Wheat 15.33 23.26 -1.45 -4.07 Potato 3.05 1.70 2.21 3.87 Pulses 0.76 6.44 -0.34A Study of Food Situation and Outlook of Asia Country Report on Bangladesh, by Chowdhury and

Shahabuddin (1992). cent per annum during the seventies and then declined slowly during the later periods. Hence, the increase in the growth of output of the rice for the postindependence period is primarily due to increase in yield, resulting from shifting of land from local to high yielding vari-

about population and income growth rates, income elasticities of demand, irrigation potential by different modes, the behaviour of yield etc. MPO (1990) exercise demonstrated that the projected demand-supply balance depend crucially on assumption about the behaviour of yields, and less on assumption about population growth rates and irrigation development strategies. It was observed, for example, that under the assumption that yield of individual variety remain constant at the current levels, foodgrain demand will exceed supply in each of the years, 1994-95, 1999-2000, 2004-05 and 2009-10. This is so irrespective of the assumptions

made about irrigation strategy

rameters about demand projec-

tions. However, if yields are as-

sumed to increase over time (at

the rather heroic rate of 2-3 per

cent year for HYVs and 1-2 per

cent year for local varieties).

then the two most productive

irrigation strategies would gen-

erate an excess of supply over

demand in every fifth year after

1994-95, upto year 2009-10.

The World Bank makes some-

what more realistic assump-

cions about the behaviour of

yields; aus and aman HYV

yields increase by 1 per year

upto a maximum yield of 2.25

MT/ha and boro HYV yield in-

crease by 0.4 per year to a max-

imum of 2.75 MT/ ha. However,

their "base" assumption about

the rate of irrigation expansion

of 2.50 lakh hectares per year,

is much higher than the MPO

assumption of 1.5 lakh hectare

annually over the next twenty

years. The World Bank projec-

tion of cereal supply fall be-

tween the MPO estimates with

present and future yields. The

World Bank projection of de-

mand, even for the higher (5 per

cent) GNP growth scenario, is

below MPO estimates because

of lower income elasticity of

demand. Consequently, World

Bank projections, for their pre-

ferred combination of demand

and supply scenario indicate

and underlying choice of pa- .

fer depending on assumptions

Asian Development Bank and UNDP we are collaborating with Government to strengthen the research and development for the horticulture sector. I think it has a good future but will required hard work to develop quality produce Livestock farming systems also has potential

ment opportunities and they will hopefully also

create possibilities for agro-linked industrial in-

vestment. Increased emphasis on fruit and veg-

etable crops is also important for raising nutri-

tion levels. It is ludicrous that there is Vitamin A

deficiency in a country which has such a good

potential for fruit and vegetables - such as pa-

As you probably know, together with the

paya, for example.

panded well in recent years, there is need for more effort to integrate productive livestock enterprises into mixed farming systems. DS: According to the report of the task forces,

prepared under interim government, fish production in the floodplain, which has great production potential, has been adversely affected by Flood Control, Drainage and Irrigation (FCD or FCDI) projects. Then how do you view the Flood Action Plan (FAP)?

Action Plan although we try to keep ourselves informed of developments.

DS: According to the FAO, all major food sys-

PM: One cannot work in Bangladesh without being optimistic about the country's future. Certainly there are problems. Administrative procedures and arrangements require considerable streamlining and improvement; the law and order situation and the legal and fiscal framework to stimulate local and foreign investment need to be put firmly in place. But the Government is tackling these issues and with the hard work and resilience of the people of Bangladesh I cannot agree that the situation is at all gloomy. From a purely technological point of view I see no reason why agricultural production cannot continue to increase and on a sustainable basis. But the essential policies are required together with a much stronger implementation capacity. There is also a need to strengthen individual commitment and motiva-

INTERVIEW WITH FAO REPRESENTATIVE IN BANGLADESH

Need for Political Will to Ensure Food Production

HERE'S a dream that I bear/ Of a far better world/Where you and I share/ Bread, water and love "- this poem was written by an 11-year old child reflecting his strong feeling while facing the absurdly of the world's situation: Earth should be mankind's mother and instead becomes a place where people die of hunger or go to war.

World Food Day (WFD) provides a remainder of FAO's continuing search for a lasting solution to the problems of hunger and poverty in the world. WFD was created with the goal that " food for all" should become a human right for present and future generations.

So, The Dafly Star approached the FAO Resident Representative in Bangladesh to know the present situation that included the areas of hunger, agri business, green revolution, biodiversity and self-sufficiency in food with special attention to Bangladesh. The excerpt of the interview follows: The Dally Star (DS): Let's start with hunger.

"Hunger is not a scourge but a scandal" — saying so Susan George has explained in her study of world hunger that malnutrition and starvation are not the result of over-population, of poor climate or lack of cultivable land; the reason why hunger exists on such a vast scale is because world food supplies are controlled by the rich nations for its wealthy consumers. How do you view it?

Peter Myers (PM): There are a lot of factors involved in this, of course. Mainly it comes down to a question of political will. Political will at all levels - at the national level in both developing as well as developed economies as well as political will at the international level.

Many countries around the world share the concern of developing countries that there are still excessive level of agricultural subsidies in some developed countries which lead to gross distortions in the market prices of agricultural commodities. That is one factor and hopefully there will be some headway made sooner or later to finalise the Uruguay round under the GATT.

But also in developing countries there is need to strengthen the political will to ensure that policies are in place which effectively address food production, nutrition and poverty alleviation. With the right policies and effective implementation capacity, productivity levels can certainly be raised.

DS: Some of the experts view that increase in food output and production per capita are a necessary condition for alleviating hunger, they are not a sufficient condition. This implies that not only the need to produce more but also the capability to purchase the food must be present. Please comment.

PM: This is true. Although we could say that Bangladesh has for the moment reached foodgrain self sufficiency at national level this by no means results in everyone having enough to eat or even meeting minimum dietary requirements. Studies show that there are still some 35 million Bangladeshis who cannot afford even minimum requirements.

Since some 80 per cent of the population live

by Rashed Mahmud Titumir

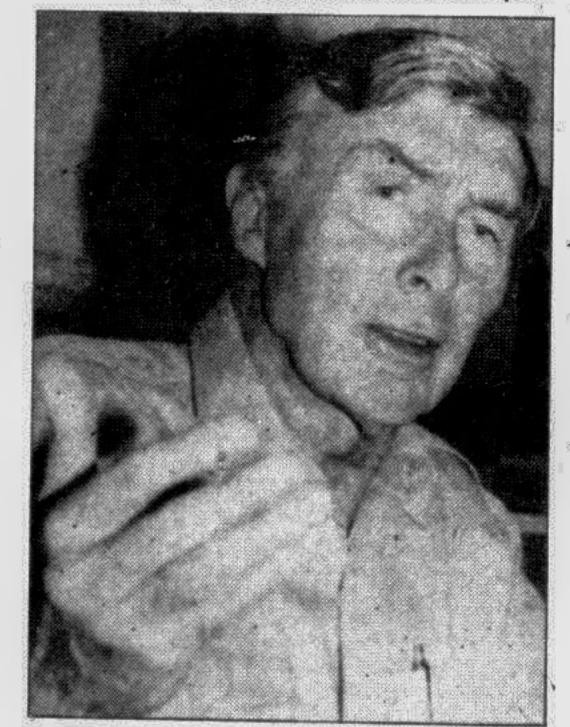
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tems.

in rural areas, what is needed is a massive increase in rural employment and it is still difficult to see how this can be generated on a sufficient scale within a meaningful time horizon. Some increase in rural employment will come

from efforts to expand food production still further. But over and above agricultural employment there is need for stimulating domestic investment so that more job opportunities are created in other sectors.

At the same time there is need to recognise that one of the fundamental problems is the burgeoning population itself and there is need to continue population control and education pro-



grammes as a very high priority.

DS: "There is a need to review the Green Revolution model as a whole", says Mr-Obaidullah Khan, FAO's Regional Representative for the Asia-Pacific. Do you have the same view?

· PM: I am not sure of the actual context of the comment made by my senior colleague and friend in Bangkok but I think, that with hindsight, we would all approach the Green Revolution somewhat differently.

However at that time it certainly met the re-

quirement of increasing food production and

without it I think hunger and malnutrition

would not have been addressed as effectively as they have been over the last 25 years or so. In northern Afghanistan where I was working in the early 1970s the HYV wheat technologies which we were supporting certainly had a tremendous impact and were quite successfully incorporated into mixed farming systems.

In rice producing countries such as Bangladesh the availability of high input HYV varieties have resulted in excessive emphasis on a very few varieties of rice and on extensive areas of rice monoculture. In terms of sustainability these trends are not desirable and we are confronted by deteriorating soil conditions and in-

In rice producing countries such as Bangladesh the availability of high input HYV varieties have resulted in excessive emphasis on a very few varieties of rice and on extensive areas of rice monoculture. In terms of sustainability these trends are not desirable and we are confronted by deteriorating soil conditions and increased vulnerability from plant pests and dis-

eases. These problems now need to be

addressed and hence the emphasis that

FAO is placing on sustainable farming sys-

creased vulnerability from plant pests and diseases. These problems now need to be addressed and hence the emphasis that FAO is placing on sustainable farming systems.

DS: This year's World Food Day's theme is "Harvesting nature's diversity" but in Bangladesh the production of non-cereal crop has been growing slowly if at all, at well below the growth rate of population or of cereals. Especially in terms of acreage and output, pulses and oilseeds, have registered negative growth, as have spices and condiments. In this gloomy situation, how does FAO see tt?

• PM: This is a good question and leads on from what I was saying before.

From the FAO side we fully endorse and support Government's efforts to diversify cropping and farming systems while at the same time continuing to support the expansion of irrigated farming under the Ministry of Agriculture's Accelerated Cereals Programme. We see a very good potential for horticultural crops. These have export potential in the longer term, they are labour intensive and will generate rural employwhich will meet international export standards At the moment, we're just at the beginning. and except for poultry production which has ex-

PM: FAO has not been involved in the Flood

My own view is that the arrangements made by the Government with the donor community to implement the various FAP studies is resulting in some very high quality work and that the data that the studies will generate will provide the Government with a much better basis than existed previously for reaching decisions on flood control measures to be taken up.

Clearly flood protection works will impact on the fisheries sector although I have not yet seen the results of the specific study on this.

tems are under severe strain today - grain output has slipped by 8 per cent from its 1984 peak, fish production has plateaued at \$7 million tons. and meat production has declined. In this global scene, how optimistic are you about Bangladesh?

tion for development.

that Bangladesh is expected to generate a surplus of foodgrains, particularly an excess supply of rice in every year after 1991, amounting to as much as 3 million tons of rice in 2010. A careful and rigorous reexamination of the underlying issues and assumptions is required before one could predict whether the MPO or World Bank projections are nearer the mark. However, if the latest Census on population growth turns out to be well founded, this would clearly point to an emerging rice surplus in Bangladesh by the end of the

The writer is Senior Research Fellow at BIDS.

century, if not earlier.