AGRICULTURE SECRETARY,
GOVT. OF INDIA

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New Delhi, January 19, 1951.

My dear Pal,

In connection with the symposium on 'Why India is deficit in foodgrains' to be recorded by A.I.R. on Monday, January 22, 1951, I send herewith some statistics which you might find useful. If you need any further information I shall be happy to supply it.

Yours sincerely,

(K.L. Panjabi)

Dr. B.P. Pal,
Director,
I.A.R.I.
New Delhi.

WHY IS INDIA DEFICIT IN FOODGRAIN PRODUCTION

Attached are statements showing:

(a) Production of foodgrains during the last 11 years.

(b) Yield per acre of rice and wheat in comparison with other countries.

(c) Additional production under Grow More Food Campaign during ~~xxxx~~

During the 11 years ending 1950 India's population has increased by 32.57 millions. The population in March, 1940 is estimated at 314.77 millions and that in March, 1950, according to Home Ministry's estimate at 347.34 millions.

IRRIGATION

Out of about 370 million acres of culturable land in India about 49 million acres or roughly 13 per cent is irrigated. No irrigation facilities are available for about 80 per cent of the culturable area. Most of the cultivated area therefore produces only one catch crop depending on the monsoon rainfall available over a period of 3 to 4 months, and remains fallow and unutilised for the rest of the year. Artificial irrigation is therefore necessary to get the best out of the land. The water resources of the country show that about 1356 million cft. flow annually through the rivers of India. Out of this about 6 per cent is at present being put to beneficial use through irrigation.

Power irrigation schemes costing about Rs.11,00 crores are under consideration or under execution. These, however, are limited by the availability of funds and time for execution.

The second source of irrigation comes from the utilisation of water available in the sub-soil. India possesses a large number of percolation wells which irrigate about 12½ million acres annually. During recent years tube-wells have been constructed on an

extensive scale. The U.P. Government have about 2200 tube-wells and there are more than double this number under private ownership.

MANURES

A careful survey of the existing supply of manure production and potential supplies in rural and urban areas show that it is possible to produce about 2.4 million tons of extra food per year by composting town refuse and preservation of cattle urine and dung. The potential supplies of manure available in the urban and rural areas are:

(1) Town refuse compost ..... 50 lakh tons giving an additional 2 lakh tons of food grains per year.

(2) Rural compost .....20 million tons with an extra food production of 20 lakh tons.

(3) Town sewage and sullage ...800 million gallons a day with an extra food production of 2 lakh tons.

CATTLE

Indian agriculture is unthinkable without the bullock. It depends on the bullock for cultivation of land, lifting water for irrigation, harvesting and thrashing of crops and transporting produce to the market. Although there are about 55.5 million male cattle over 3 years of age in the Union, because of the low efficiency there is a shortage of useful cattle in the country. There is already a grave shortage of cattle fodder. The problem therefore is to increase the efficiency of the working cattle to increase agricultural production.

FRAGMENTATION OF HOLDINGS

The average size of these holdings is 2.7 acres in Assam Valley, varying from 2.48 acres in some division to 15 in others in Bombay and from 5 acres to 16 in Punjab.

Foodgrains* - Acreage and Production - Reporting and Non-reporting areas.

INDIAN UNION

1939 - 40 to 1949 - 50

Years	Acreage ('000 acres)			Production ('000 tons)		
	Reporting areas	Non - reporting areas	Total	Reporting areas	Non-reporting areas	Total
1939-40	155,790	N.A.	155,790	42,764	6,143	48,907
1940-41	155,974	N.A.	155,974	41,891	6,561	48,452
1941-42	155,995	N.A.	155,995	40,634	6,211	46,845
1942-43	164,332	N.A.	164,332	44,224	6,281	50,505
1943-44	166,347	25,718	192,065	45,441	6,214	51,655
1944-45	183,069	19,291	202,360	46,093	4,988	51,081
1945-46	177,899	19,638	197,537	40,768	4,968	45,736
1946-47	181,736	14,093	195,829	42,197	3,946	46,143
1947-48	177,876	13,662	191,538	44,393	3,851	48,244
1948-49	189,598	11,543	201,141	44,260	2,920	47,180
1949-50	195,507	11,553	207,060	45,841	2,920	48,761

N.A. - Not available.

* Relates to Rice, wheat, Jowar, Bajra, Maize, Ragi, Barley and Gram.

Note: Figures from 1944-45 onwards are not strictly comparable with those relating to years earlier than 1944-45 because of increase in reporting areas.

Yield per acre of Rice and Wheat.

Countries	(Lbs.) 1948-49 Rice	Wheat
India	692	561
U.S.A.	2,097(c)	1,079(c)
Argentina	2,070(c)	955(c)
Australia	3,604(c)	910(c)
Burma	1,213(c)	285(a)
China	2,248(c)	999(b)

(a) for 1947

(b) for 1948 and relates to 22 Provinces of China.

(c) for 1948.

Yardsticks of Additional Production and Target and Achievement under G.M.F.Campaign.

Name of Schemes.	All India yardstick of additional production.	Estimated additional production achieved under G.M.F. Campaign during 1949-50 (over 1948-49) (lakh tons)	Target of Addl. Production under G.M.F. campaign during 1950-51 (over 1949-50) (lakh tons)
I. Irrigation Schemes.	1/5th ton per acre of area irrigated.	4.39	7.06
II. Distribution of Manures and Fertilisers			
1.Ammonium Sulphate	2 tons per ton of qnty.	0.66	1.85
2.Oilcake	1.0 " " " " "	0.61	0.12
3.Town Compost	0.03 " " " " "	0.14	0.33
4.Green Manures (seeds)	4.0 " " " " "	0.12	0.25
5.Others		0.95	0.96
Total (1 to 5)		2.47	3.51

B.P.Pal

How Scientific research can help to increase productivity

Scientific research can aid in overcoming the deficit in food production in a number of ways. It can increase the yield of the existing varieties by indicating what are the suitable manures and the suitable times of application for these. It can indicate what should be the optimum times of sowing and cultural operations for each crop, what is the most paying rotation over a period of years for maintaining soil fertility and yet giving high yields per acre. Research on water requirements of plants can show how our existing resources of water can be used most efficiently.

The plant breeders can evolve new varieties of plants which are capable of giving higher yields than the old varieties. In Europe and America large number of new varieties have been almost made to order. If there is demand for a bigger onion, or a disease resistant water melon, or a wheat which will produce a branched ear, the modern geneticist can do it. In fact he has invented some new kinds of cereals, which did not exist before; for instance, by crossing ~~wheat~~ wheat with rye a Swedish scientist succeeded in producing a new cereal called Triticale. In India also certain amount of work has been done already and to give a couple of instances the well-known Punjab wheat C.591 is very high yielding and gives grain of good quality, New Pusa 165 is another high yielding variety, which possesses earliness and resistance to disease. In nature considerable variation in yielding power exists and often the characters, which a farmer would desire in his varieties, are not to be found in any one variety. The plant breeder endeavours, therefore, to make new combinations of characters with the object of producing superior new varieties. Not only can he increase the yields but also the quality of the grain and the ability of the variety to resist pests and diseases. To give just one instance, the wheat rust in India causes an annual loss,

which roughly comes to 150 million rupees. It is obvious that these have to be controlled if you have to obtain maximum production.

Scientific research also controls pests and diseases by other methods, such as the application of chemical substances, which kill these pests and diseases.

India has one of the lowest yields per acre for most of our crops compared to other countries of the world. This should not discourage us as the very fact of the low yields indicates that there is considerable scope for increasing production by the application of scientific methods.

B.P.Pal

An aspect of cattle improvement, which requires to be given more attention as it is capable of improving our cattle wealth, is the application of plant genetics to animals.

B.P.Pal

Why agricultural productivity is low

It is really not surprising that India should be deficit in food. Unlike countries with a young agriculture such as America and Australia, the soil of India has supported for thousands of years, one of the largest populations in the world which is still increasing ! The great pressure on the land has resulted in emphasis on crops intended for the use of man himself and has reduced recuperative fodder crops and grasses which are extensively used in the agriculturally advanced countries of the temperate zone. There has been insufficient return of organic matter to the soil; with the gradual disappearance of the forests, farmyard manure has been more and more used for fuel. Export of oilseeds in the recent past has again deprived the soil of another source of organic matter as formerly the residues remaining after the ~~expression~~ expulsion of the oil used to go back to the land. The export of bones is a similar case. One can think of other causes, which have gone to make agricultural land less productive. For instance, the railway systems with their embankments have interfered with the natural drainage of the land in some areas resulting in annually-recurring floods which damage the crops. Soil erosion has been going on unchecked and has contributed to the deterioration of much cultivable land. Irrigation systems while a great boon, have in some cases created another problem as seepage has resulted in the rising of the water-table and the accumulation of injurious salts. Insufficiency of farm animals or agricultural supplies may make it impossible for the farmer to sow and perform other agricultural operations in time.

Apart from lack of rain or irrigation, or insufficient manuring, lack of good seeds may be an important factor limiting agricultural production. Diseases and pests also take their toll.

Regarding nutritional requirements of food grains, besides increasing the yields per acre it is possible to grow more nutritious food grains. It is well known that the proper application of manures can improve the nutritive value of a grain. Here again the plant breeder can evolve varieties with a higher food value. For instance, at the Indian Agricultural Research Institute the vitamin C content of tomatoes has been doubled.
