

WHEAT IN INDIA'S ECONOMY

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INTRODUCTION

The problem of food is very important at present. In India cereals form the major portion of diet and wheat is a decidedly more protective and energy-giving grain than other cereals. India has been going through a grave food crisis. Her struggle depends much on the help of wheat imports from outside. It is not very far back that India used to export considerable quantities of wheat.

In this study an effort was made to ascertain the position of wheat in the economy of India. The methods used were mostly historical and analytical. The industrial economy of India is discussed. The facts about production, consumption, marketing, distribution, and export trade are set forth and analyzed. Suggestions have been put forward and effort made to show the future trend of the wheat industry in the country's economy based on facts discussed there.

To an inquirer from the international interest only are data available. The shortage of food in the world is the burning problem of the time. The United States is the country which can help to solve this problem. However, people want to know about the food problems in countries like India. This thesis endeavors to help by discussing one phase of the food problem, that of wheat.

The writer will be grateful if a true prospectus is obtained and if knowledge has been contributed by this manuscript.

THE ECONOMY OF INDIA

India lies north of the Equator. The southern point of the mainland, Cape Comorain, is in latitudes 80N. The Tropic of Cancer passes through India, cutting the country into two halves. The Northern Frontier of India reaches 37 degrees north. Although roughly half of India lies in the temperate zone, it is usually thought of as a tropical country due to its common type of climate throughout. It reaches from longitude 61° E. to 101° E., which is one-ninth of the way around the globe. Longitude 70° E. passes through the Indus Valley and longitude 90° passes through the Delta of Ganges. The Great Plain between these two regions is the principal wheat-growing area.

India stretches 2,500 miles from east to west and 2,000 miles from north to south, comprising 1,550,000 square miles. The countries which border India are Persia, Afghanistan on the west, and Russian Turkestan and Tibet on the north. On the east of India lies Burma, while to the south is the Indian Ocean. India has 5,000 miles of land frontier and 3,500 miles of sea frontier.

India is favorably situated for sea trade with Europe via the Suez Canal, with Africa, with the Far East via Singapore, and with Australia.

In the northern half of India are two large rivers. On the west, flowing almost from north to south along the fold of the Barrier Mountains (Himalayas), is the river Indus; and several other rivers join together and flow into the Indus about half

way to the coast (see Figure 1). The land through which these rivers flow, down to where they join the Indus, is called the Punjab, literally the "land of five waters", and consequently also "the granary of India". This is the principal wheat-growing region.

The other great river which flows from west to east is called the Ganges. This great river waters the low-lying plain with the help of its tributaries. In this part of the plain is situated the United Provinces, which is the second important wheat-growing region. ~~X~~ If one travels from Calcutta on the extreme east of this plain to Karachi on the extreme west, all through it, he will not see a single hillock. ~~X~~ The plain of the Ganges is the most fertile part of India.

Parts of India are nearly rainless and there can be no cultivation without irrigation. Other parts have heavy rainfall at certain seasons and are rainless the remainder of the year. Rice, a valuable crop, is almost a water plant, and needs a constant supply of water passing over it. Millet, which forms so large a portion of the farmers' food, can be raised without irrigation in ordinary years, but about every 11 years comes a season of drought. These droughts have been followed by terrible famines in which hundreds of thousands of people died.

During the last decade, 1931-41, the population of India increased over 50 million, or 15 percent. There was no record of epidemic or famine of great importance in this period. Since 1921 the growth of population of India has been of the same order as the growth of Europe's population, in the half century preced-

ing World War I, and as that of Japan since about 1900.¹

Calcutta is the largest port in India. The second port of India, Bombay, is on the west coast of the peninsula. The third port is Karachi on the Indus River and Arabian Sea. Karachi is important as the port from which almost all the export movement of wheat takes place. The domestic prices of Indian wheat are quoted under the name of White Karachi.

The national per capita income is difficult to judge. However, most Indian economists agree that the per capita national income is between 67 and 70 rupees, or \$23 a year. Britain and other countries of western Europe average about \$300 a year. The United States average is well above that figure. Russia in 1925 was reckoned to have twice as high an income and even Bulgaria averages some \$40.

The poverty of India is reflected in all statistics of the country as will easily be seen from the table below:

Table 1. Economic comparison of India and United States.

Indication	India	United States
Death rate per thousand	22.4	10.7
Infant mortality per thousand	171	47
Average expectation of life	26 years	65
Population poorly nourished	61%	23%
Taxable capacity	\$2.00	\$64.00
Expense on education per head	.04 a year	\$20.70
Expense on public health	5 to 15 cents per capita per year	\$1.90 per capita per year

¹ Warren S. Thompson, "Plenty of People," pp. 18-20.

There are several reasons why India has a low per capita income. One reason is that the country is going from a medieval economy to a modern one. And this change is yet far from complete! However, today India is reckoned as the seventh industrial nation in the world.² The present-day poverty in India revolves around overpopulation, underproduction and maldistribution. Table 2 shows a comparison of production in India with that of the United States.

Table 2. Comparison between productive capacity of India and United States.

	India	United States
National income	5½ to 6 billion dollars (excluding Princely States) Including States, less than 10 billion dollars	Over 90 billion dollars (post-war prediction, 100 billion dollars)
Value of agricultural produce in 1931	\$3,500,000,000 (more than half the national income)	\$3,569,000,000 (only a fraction of national income)
Area cultivated by one farm worker	3.9 acres	10.6 acres
Productive capacity of farmer	1/3 to 1/4	1

Only a small part of this difference in productivity can be attributed merely to disadvantages of climate or aptitude and character. The United States owes much of its superiority to methods of production. There is tremendous pressure of population on the land in India.

²Sir Fredrick Whyte, "India a Bird's Eye View," pp. 55-60.

Industrial Resources

India is well supplied with a number of important minerals. If advantage is taken of these resources for industrial use, India will have a very bright future.

The largest deposits of high-grade iron ore in the world are in India. India produces iron ore at the rate of three million tons a year. The United States has 25 percent more in quantity, but the ore from India has a higher iron content. The deposits are in close proximity to sources of coal, magnesite, and limestone. The largest steel plant in the British commonwealth is in India, at Jamshedpur, which is the famous Tata works built by American experts. It is entirely Indian owned and managed. Tata, with three plants, accounts for the bulk of India's steel production. The pre-war estimate of output was three-fourths million tons. When extensions are completed the output will reach one to one and a half million tons a year. India is making progress, not only in quantity but in quality of steel also. Stainless steel is being manufactured. India is beginning to make her own locomotives. Coal reserves computed at 76 million tons are very extensive. However, only a small proportion is of good coking variety. Coal produced amounts to 25 million tons a year.

Since the beginning of this century India has shared with Russia the position of chief producer of manganese, which is vital for the hardening of steel. India meets one-third of the world's demand for manganese. It leads the world in deposits of magnesite and limestone and has large chrome reserves.

The progress of mineral resource production has been very satisfactory. In 1900, 16 million dollars' worth of minerals a year were tapped, while in 1938 the value was 160 million dollars.

So far, India has only one airplane factory and one auto factory. India depends heavily on the United States now for heavy machinery and plants. However, machine tool production was started during the war.

In the marshes of Bengal and other water-logged areas, jute has been grown from time immemorial. Today 70 percent of the capital in jute industry is in Indian hands, though management is still mostly Scotch. There are 100 jute mills exporting a million tons of manufactured jute fiber. Another export industry introduced by the British is tea, which employs about 900,000 people.

Sugar ranks third in Indian industry. Sugar cane occupies the largest area of crops grown in India. One million tons of refined sugar are produced a year. India's capacity is for 50 percent more production than today's home consumption.

Cement production is more than one million tons today, enough for peace-time requirements. Paper manufacture is only in its beginning. Glass imports have come down to half the quantity in 1931. The soap industry has developed to increase the home crushing of wild seeds.

Bauxite is plentiful. A factory in Travancore in south India is now producing aluminium. Sulphur of the highest quality has been discovered in Baluchistan. India supplies 80 percent of the world's output of mica, which is essential for electrical equipment of all kinds. India meets about three-fourths of the

world's requirement for mica.

However, India lacks the base metals. The deposits of tin, lead, copper, and zinc are modest. Gold is mined in quantities worth only 12 million dollars a year, on the average. Oil in India is deficient. Production by Burma and the Northwest Frontier is only 87 million gallons a year, which is less than 1 percent of the world output.

Rubber tires for cycles and cars and trucks are produced on the Travancore rubber plantations. Substantial progress is being made in the manufacture of acids and alkalies. The war introduced the manufacture of soda ash, synthetic ammonia, chlorine, caustic soda, bleaching powder, dichromates, etc. These chemicals will aid in the production of food by providing fertilizers and insecticides.

India is the largest producer of hides and skins. This is not surprising, since India has one-third of the world's cattle population. About half of the hides are tanned in the country. Chrome tanning has developed rapidly in the last 20 years. Shoe and saddle leather is being produced in Madras, Calcutta, and Cawnpore. India supplies all shoe and saddlery equipment for its army of two million men, and 1½ million pairs of shoes each year for Britain's military.

Industrial Progress

The largest undertaking towards industrial progress in India is the extensive railway system. It is one of the world's greatest enterprises. A capital of 2500 million dollars is invested

in it. All capital was raised in London, but Indian railways are not British owned. Forty-one thousand miles are under control of the Government. The other 33 thousand are today Government owned, the Government having bought them out from the private companies which built them. The entire indebtedness on the railroads has been paid. The large profit of Indian railways is returned to the national budget. In the four war years the railways contributed some 200 million dollars to the general budget of the country. This was a substantial help to the resources of the nation. There are eight million employed on the railroads.

Cotton spinning and weaving is the largest private industry. Three hundred eighty-nine million persons work more than 10 million spindles and 200,000 looms to turn out five billion yards of cloth a year. Nevertheless, all this production except two to three million yards is consumed by the home market.

Hand looms of cotton turn out another two billion yards of cotton cloth, which is also consumed in India. Most of the cotton is home grown, but considerable quantities of American and Egyptian long-staple cotton are imported. Efforts are being made to increase the staple length of cotton. A surplus of 2½ billion bales of cotton a year occurs. This brings them a direct clash of interest between the producer of cotton and the mill owner.

The deficiency of oil coupled with high-grade coal shortage is a serious drawback. However, India has great potentialities for hydro-electric development. It is estimated that India could produce some 39 million horsepower out of a world total of 300 million.

Only about a half million horsepower so far has been har-

nessed. This project of hydro-electric development requires a great outlay to begin with. The grid system schemes are waiting to be launched. This will open up an immense possibility of industry in rural areas. In some parts, as Bombay, Madras, Mysore, and Travancore, electric power has been carried to rural areas.

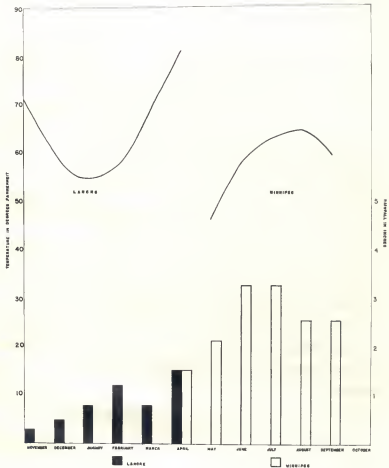
From the standpoint of time, industrialization of India is in its infancy compared to the agriculture of the land. However, on the basis of progress and prospects for future development, both industry and agriculture have room for tremendous improvement. In many respects progress of the two is closely related. Many of the things needed for agricultural progress are products or by-products of industry. At the same time many raw products needed for industrialization are agricultural products. The interdependence is such that the advancement of one relies on the concurrent advance of the other.

As industrialization develops, more and more people will be attracted from the small villages and farms to work in the factories. This should allow a consolidation of many small plots of land into larger units. This in turn should provide the opportunity for more efficient production and relieve, to some extent, the present pressure on the land.

EXPLANATION OF PLATE I

The plate shows the climatic conditions under which wheat is grown in the Punjab and Canada. Note from the shape of the curves the sudden and gradual rise of temperature in two areas. In India the crop ripens in a suddenly increasing temperature, while in Canada it ripens in a gradually falling temperature. The amount of rainfall during wheat season in India and Canada is shown by bar chart. It clearly indicates the necessity of irrigation in India, while in Canada, on the other hand, there is sufficient rainfall. It will be noticed that in India, while the growing period of wheat is characterized by favorable climatic conditions, the harvesting period is marked by unfavorable conditions.

PLATE I



PRODUCTION OF WHEAT

Climatic Conditions

7

The largest portion of wheat production in India is from the winter crop. This is due to the fact that suitable temperatures are available in this period. Wheat is sown in India from October to December and is harvested from March to June in various provinces.

Another feature of wheat production in India is the dependence on irrigation. Irrigation plays the most important part in wheat production during the dry season. In some years when monsoon rainfall has been deficient, even the sowing of wheat is done with the help of irrigation. In the United States and Europe irrigation is not an important feature of wheat production. Only in Australia, South Africa, and the western part of the United States is irrigation resorted to for the production of wheat.

Wheat in India is sown in fields which have been prepared after about a fortnight of monsoon rains, in Northern India, and when nights have become sufficiently cool to cause the formation of dew in fields. This situation occurs about the end of October. Summer fallow is practiced and a little manure also is applied. The sowing of wheat is done more carefully than is the sowing of other summer crops, which are broadcast. Wheat is sown in drills made by a plow. This is also an indication of the commercial importance of the crop to the Indian farmer.

Winter rains are an advantage in Northern India and on irrigation projects in areas where wheat is important. They provide

moisture to the plant during its early growth, which, accompanied by the cool temperatures of December, helps tillering. By the end of February, when grain has formed, temperatures begin to rise and help in the ripening of the crop.

There are certain climatic drawbacks under which Indian wheat is cultivated. The change in seasons from winter to summer is abrupt. The rise of temperature is not gradual as in Russia, Canada, or the United States, and therefore the crop matures quickly and not gradually.

The inferiority of the wheat grown in India is due to the sudden ripening of the crop. The rise of temperature is usually accompanied by dry winds which quickly dry up the sap in the grain. Therefore, the result is a shriveled and thin grain in contrast to a fully developed and rounded grain as in other countries. The wind often brings about lodging of the crop, as it blows with considerable velocity and as the plant has a weak straw which offers no resistance to the felling thus caused. Local storms leading to hail and rain are also common in Northern India during March and April, and cause difficulties in the harvest, or the gathering of the crop.

In India most crops are harvested by gathering in the whole plant and not the grain only, as in America. India straw has considerable importance for fodder. Among villages in India, while there is trade in grain, there is practically no fodder. Fodder has to be carefully conserved, as a consequence. The considerable amount of impurities in Indian wheat is due to this method of gathering. Indian wheat is not in high demand on the world market.

The conditions of rainfall and temperature during the production of wheat in India and Canada are compared in PLATE I.

Varieties

The main varieties of wheat grown in India belong to the "vulgare" and "durum" species. The vulgare wheat is grown widely under irrigated and unirrigated conditions in Northern India and in the Central Provinces. Hard or semi-hard white vulgare wheat is grown in the Canal Colonies in the Punjab and in North Sind; in recent years it also is being cultivated in the western districts of the United Provinces.

Durum wheat is mainly grown in the Bombay Province and Central Provinces and as it has a high gluten content it is greatly prized for the making of Semolina Suji.³ The varieties are called Wadanak, Hansa, Jalalia, Kothia, Peela, and Bansi.

The Vulgare wheat may be divided into three classes--white, red, and a mixture of red and white. Each of these may be subdivided into hard, semi-hard, and soft. The white hard wheat has various trade names, for example, Sharbati (Punjab); Chandausi, Gangajali, Hansia (United Provinces); Piesi Bot (Central Provinces). The soft wheat is called Piesia (Punjab); Safed Deel (United Provinces); Bodia, Hansia (Central Provinces).

The mixed varieties are called Dara almost everywhere.

"We have identified in all thirty-seven botanical varieties of which ten belong to the sub-species *Triticum durum*, two to *Triticum turgidum*, six to *Triticum compactum*, one to *Triticum*

³It is a whole wheat ground product.

dicoccum and the rest to *Triticum vulgare*.

"Macaroni wheats are commonest on the black cotton soils in Bombay and the Central Provinces and extend into the Punjab and to a very slight extent into the United Provinces. There is, however, curious exception of the Macaroni wheats var. *melanopus* and var. *murciense* which appear to have the widest distribution, i. e., var. *melanopus* occurs in the Punjab, United Provinces, Bombay and Central Provinces, while var. *murciense* occurs pre-eminently in the south of Bombay and Central Provinces."⁴

Areas of Production

On the whole 29 percent of the total acreage of land under wheat in India is in the province of the Punjab. Most of the wheat area in the Punjab is found in the northern part of the province. Thus, the five districts account for about one-third of the total wheat area of the zone; namely, Lyalpur, Multan, Attock, Ferozepur, and Montgomery. Incidentally, it is the northern Punjab that has abundant facilities for irrigation.

Not only in area but in output of wheat also the Punjab ranks first. About three million tons, which are equal to 30 percent of total output, come from the Punjab.

Yield per acre in the Punjab is not the highest, as compared with other provinces. The comparison between the yields in three important wheat-producing provinces is shown below:

Province:	Punjab	Sind	United Provinces
City :	Jallendar	Nawabshah	Bulandshahr
Yield :	1250 lbs.	1374 lbs.	1300 lbs.

⁴ Albert Howard, "Wheat in India," p. 22.



FIG. 1. DISTRIBUTION OF WHEAT IN INDIA. (Dots and dashes represent 100,000 acres)

Next in the area of production is the United Provinces, which have about eight million acres, or 24 percent, of total wheat area in India. Most of the wheat area in this province lies in the Delta (called Doab) of the rivers Ganges and Gogra. More than half of the wheat area is in this region. Next comes the Doab between the Ganges and the Jumna River which occupies about one-fifth of this area. The last important districts for wheat in the U. P. are those lying at the junction between the peninsular region and the Ganges Plain.

The cultivation of wheat is important in the district east of Gogra, owing to the fertile soil, technically termed as alluvial, and also irrigation facilities from tube wells. In fact, the largest acreage in wheat in this province is in the district of Gorakhpur. This is, however, due to the fact that this district also has the largest cultivated area of land in the U. P. However, the proportion of area under wheat to total cultivated area of land in this district is only about one-seventh, which may be compared with other districts in the province as given below:

District	Gorakhpur	Meerut	Bulandshahr
Proportion (wheat area to total cultivated area)	1/7	1/3	1/4

The significant fact to be noted about this province is the highest yield of wheat as compared with that of other provinces. The best yields in the U. P. are, however, lower than the best yields in other provinces. Higher yields in the U. P. are char-

acteristic of the irrigated area of the Ganges and Jumna Doab and of the district east of the Gogra River. It is the unirrigated areas that lower the average yield in the U. P.

We can conclude from the geographical distribution of wheat production in India that it is practiced mostly in the alluvial soils of the Indo-Gangetic Plain and the Black Cotton soils of the Peninsula, provided the rainfall there is less than 40 inches.

The importance of wheat production is not the same for all provinces in India. In the Northwest Frontier Province, 50 percent of the total net area cultivated is in wheat, while in Bihar it is only 5 percent. In Central India it is 44 percent. In the two most important wheat provinces of the Punjab and the U. P. the percentage is 29 and 22, respectively. Wheat is a money crop and has, therefore, to compete with other cash crops such as sugar-cane and cotton.

The best land is divided among these cash crops. This division depends upon rainfall fluctuations. When rainfall conditions are unfavorable, poorer crops like barley and gram (peanut) occupy the land that is usually allotted to wheat. This particular behavior of agricultural production has a bearing upon the export movement of wheat from India as is noted in the chapter on "Exports and Imports of Wheat in India."

The distribution of wheat in India is shown by means of dot map in Figure 1. The areas of production are all located in the network of the large rivers, the Ganges and the Indus, and their tributaries.

Importance of Wheat in Relation to Other Grains

Wheat is the second most important crop in India. Wheat occupied 6.6 percent acreage in 1908-10. The Punjab, United Provinces, and the Northwest Frontier Province are the greatest wheat-producing regions in India, with 18.9 percent, 14.8 percent, and 17.8 percent of the total cultivable area under them in 1908-10. Other provinces such as Central Provinces and Berar had 7.4 percent, Bombay 3.7 percent, Sind 3.4 percent, Bengal 1.9 percent, while Assam and Madras were having very insignificant averages. The statistics of 1937-39 revealed that while the area in this crop has increased 0.9 percent, there has been a change in wheat production in various parts of the country, as shown below. During this period Punjab had 20.8 percent of the total cultivable area, while the U. P. had 16.8 percent, Sind 6.9 percent, G. P. and Berar 7.7 percent, and Bombay 5.2 percent. These provinces have given encouragement to this crop. Other provinces have received a little setback.

Rice is the most important crop in India. About 18.9 percent of total cultivable area was under rice in 1908-10, while it occupied 19.7 percent total cultivable area in 1937-39. Jowar (sorghum) is the third crop in order of area occupied by food grains in the country. It extended over 6.4 percent of the cultivable area in 1908-10. In 1937-39 we find that there was a trend toward smaller acreage in this crop except in Bombay, which had made an increase of 3.0 percent. Bajra (millet), though a little less important than jowar, occupied about 4.7 percent of the cul-

tivable area of British India in 1906-10, while in 1937-39 it had 3.6 percent of the cultivable area of British India and marked the fall of 1.1 percent.

Barley is grown in most of the provinces like Assam, Bombay, Central Provinces, Berar, and Madras. This crop occupied only 2.4 percent of the total area of India in 1906-10. In 1937-39 there was a smaller acreage in almost every province.

Maize production is tending to decrease, occupying 1.3 percent of the total area in 1937-39 as against 1.9 percent in 1906-10.

Jowar, bajra, barley, and maize are generally used as food grain by poor people who cannot afford rice or wheat.

Yield per Acre

90th

The yield of wheat per acre in India is very low, owing mainly to the poverty of Indian farmers who cannot afford much manuring, even though the farming in India is typically "intensive". Indian yield ranks with lower yields of newer countries of America or Australia where farming methods are "extensive" and cannot therefore produce high yields per acre. The yields per acre in intensive countries of Western Europe are about three times larger than in India. The largest yield per acre in India is in the western districts of the U. P. and the lowest in Chhotanagpur. It is to be noted that yield per acre is low in all important producer countries of the world--Russia, U. S. A., Canada, India, and Argentina. All record low yields.

The figures for the yield of wheat in various provinces are

discussed under the subheading of "Areas of Wheat Production in India."

In addition to increasing acreage, attempts are being made to improve the yield. In the course of recent century there has been no increase in average yield per acre. Prof. Radhakamal Mukherjee writes, "Indian crop yield can be at least doubled by use of improved seeds and method of tillage, fertilizers and by utilizing idle and semi-idle labor."⁵

In 1904 the Imperial Institute of Agricultural Research was founded at Pusa (recently moved to Delhi), and in fact much work has been done to improve both methods of cultivation and varieties of wheat grown. Pusa wheat is the best evolved variety for yield and rust resistance now in India.

Particular efforts have been made to discover a rust-resistant wheat because rust is a great scourge in India. Also, efforts are made to produce a variety that will ripen sufficiently fast to avoid being caught by a hot, dry season. More than 20 million acres have already been sown with improved varieties of wheat seeds.

Because of extensive use of irrigation, variations in yield per acre are moderate--much smaller than in Canada, Argentina, and Australia. Crop failures are never as extreme as in Australia. In India, as in no other country, variations in wheat production, from year to year, are due about as much to variations in acreage as to variations in yield per acre. This is shown in Table 3.

⁵Radhakamal Mukherjee, "Report of the Food Grains Policy Committee," p. 25.

Table 3. Area, yield, and production of wheat in India.

August 1 to July 31	Wheat area, million acres	Yield, bushels per acre	Production, million bushels
1909-14	29.23	12.0	351.8
1914-19	31.95	11.0	353.0
1919-22	26.51	11.4	302.9
1922-23	28.21	13.0	367.0
1923-24	30.85	12.1	372.4
1924-25	31.18	11.6	360.6
1925-26	31.78	10.4	331.0
1926-27	30.47	10.7	324.7
1927-28	31.30	10.7	335.0
1928-29	32.19	9.0	290.9
1929-30	31.97	10.0	320.8
1930-31	31.65	12.3	390.8
1931-32	32.19	10.8	347.4
1932-33	33.80	10.0	336.9
1933-34	32.97	10.7	352.8
1934-35	35.99	9.8	351.5
1935-36	34.49	10.5	363.2
1936-37	33.64	10.5	351.7
1937-38	33.22	11.1	364.0
1938-39	35.60	11.3	402.0
1939-40	34.00	11.8	420.0
1940-41	34.85	10.8	373.0
1941-42	34.03	11.0	373.0
1942-43	34.41	12.0	410.0
1943-44	33.96	10.7	363.0
1944-45	35.98	10.4	392.0
1945-46	34.55	9.7	332.0

Source: International Yearbook of Agricultural Statistics.
Statement supplied by Government of India, Ministry of
Agriculture, on request.

Table 4. Percentage area under different crops in provinces in 1908-10 and 1937-39.

Provinces	Total cultivated area, million acres	Wheat	Rice	Barley	Jowar (sorghum)
		1908-10:1937-39	1908-10:1937-39	1908-10:1937-39	1908-10:1937-39
Assam	21.9	--	20.1	--	--
Bengal	72.9	1.0	51.1	1.9	0.1
Bombay	34.3	3.7	5.2	--	19.8
G.P. & Berar	41.8	7.4	11.1	--	10.8
Madras	52.0	--	20.0	--	10.0
Sind	14.8	3.4	6.9	--	4.0
N.W. Prov.	5.6	17.8	7.1	5.4	19.6
Punjab	45.4	18.9	1.5	2.4	1.7
U. P.	43.9	14.8	17.6	11.4	5.9
Total for India except Princely States	339.7	6.6	7.5	2.4	6.4
		19.7	2.2	6.0	

Source: "Food Policy for India," S. G. Tiwari, Benares Hindu University, 1945.

Table 5. Intensive cultivation in India (in million acres).

Provinces	Average net : cropped area in :	Average area : sown more than once in :	Percent of double : cropped area to net : cropped area in :	Percent increase (+) or decrease (-) in
	1908-10:1937-39:	1908-10:1937-39:	1908-10:1937-39:	1939 over 1910
Assam	5.5	6.5	0.4	0.8
Bengal	25.2	28.6	1.7	1.0
Bombay	50.5	49.6	10.6	10.7
C.P. & Berar	24.6	24.3	2.0	2.9
Madras	32.2	31.6	4.2	4.7
Sind	4.0	5.0	0.4	0.6
N.W.F. Prov- ince	2.4	2.0	0.4	0.4
Punjab	25.4	26.0	3.7	4.0
U. P.	36.2	36.2	7.6	8.7
Total for In- dia except Princely States	207.8	210.9	30.6	34.0
			14.7	16.6
				+1.9

Source: "Food Policy for India," S. G. Tiwari, Benares Hindu University, 1945.

The farmers' implements are exceedingly primitive, though intelligently employed. In spite of intensive methods of cultivation, the average yield is consequently low--averaging 11 to 12 bushels per acre. However, there are now some prospects for better yields through improvements.

Possibilities of Increased Production

The production of any crop can be increased by extensive and intensive cultivation. The possibilities in the light of these two methods are recognized.

(1) Extensive Cultivation:

The percentage of net crop to the total crop area of former British India excluding Burma in 1937-39 or that of 1908-10 has fallen by 2 percent. It shows that the maximum point of extensive cultivation was attained even earlier than 1908-10.

It will be found by referring to Table 4 that in most wheat-producing provinces, namely, the Punjab, U. P., G. P., Bombay, Sind, and M. W. F. province, the trend on the whole is toward fewer crop failures, except for a slight increase in the provinces of Sind and Bombay. In the most important provinces from the viewpoint of wheat in India, namely, the Punjab and the U. P., the picture also is disappointing. In the Punjab the wheat area has remained nearly the same, while the U. P. has suffered an actual decrease or failure of wheat area as high as 8 percent.

It appears, therefore, that under the existing technic, there is no possibility of bringing more land under cultivation of wheat. Also, it is not profitable for the cultivator to bring

new land under the plow.

The other approach to the problem with this view would be the utilization of "waste land". The matter of cultivable waste land in India is much debated.

Table 4 shows that, out of the total cultivable 353 million acres, 94.4 million acres were cultivable waste other than fallow, that is, about 26.7 percent of total cultivable area, is still available for further cultivation.

In Assam and N. W. P. provinces, more than 60 percent of area of land is available for cultivation. In other provinces the percentage of area of land available ranges from 20 to 30.

One important fact regarding this cultivable waste should not be overlooked. The area of land included in "cultivable waste other than fallow" is not known and no definite opinion about this possibility can be formed.

A conclusion often advocated is that these cultivable waste lands have a great potential in producing food required. Strangely enough, there are practical difficulties, as otherwise supported, in the fact that the population pressure and land hunger of the people would have gone ahead to bring about this change.

Some of the difficulties can be cited as follows: These lands are located in unhealthy tracts, others lack irrigation facilities which are so necessary for food production in India, some again are situated in tracts where labor is not easily available, which, incidentally, is indispensable to Indian agriculture, and others again are such as would not yield any economic return under normal conditions.⁶

⁶Government of India, "Report of the Food Grains Policy Committee," p. 25.

There is one great potential not yet fully exploited, namely, the nature of supply of water for irrigation projects. The dams have not been built on these rivers, however, as profusely as there are sources for them.

Another avenue of disfavor for this opportunity is desirability of having more forest area. It is believed that in a sound economic system the area under forest should not fall below 20 percent of the total area. During recent years felling of trees in the forest had great repercussions on Indian agriculture. The effect was manifested by some big floods of the Ganges River the last couple of years.

Considering this fact, it appears that the acreage of forests in India should be 102.5 million acres, while it is at present only 68.1 million acres. This means that about 34.4 million acres of land have yet to be reforested.

In all the provinces, except C. P. and Berar, where forest area is 25 percent of total land, the area under forest is much below 20 percent of total land. In Sind, W. W. F., and Punjab provinces, which are the greatest wheat-producing areas, it is even below 4 percent of the total land.

"This adjustment in forest area will have far-reaching changes in agricultural economy of our country."⁷

(2) Intensive Cultivation:

From Table 5 it will be seen that the percentage of the double-cropped area of 1937-39 over that of 1908-10 has increased 2.1 percent. In 1937-39 about 16.6 percent of the land was inten-

⁷S. G. Tiwari, "Food Policy for India," p. 21.

sively cultivated. Increased cultivation has been very slight in the last two decades.

The Indian farmer is helpless to do much about it, due to his increased poverty. He is unable to invest more capital in land. He cannot use fertilizers to increase the productivity of the soil. The Department of Agriculture of India, however, has been continuously bringing out improved varieties of wheat and the manuring and compost programs.

Extending the area under cultivation is disappointing; however, the land coming under the heading of cultivable waste other than "fallow" can be brought under cultivation provided the defective physical and chemical qualities of the soil are made good by the use of manure and fertilizers, adequate provision of water supply is made, cheap and accessible means of transportation are available, and unhealthy conditions in some areas are modified.

It is gratifying to note that a big irrigation project of constructing a dam across the Damodar River in south India has already been taken up. This project will not increase wheat production but will help the cereal and food supply of India. The irrigation system of India is larger than that of the next 10 largest in the world, including that of the United States, but only 17 percent of the cultivated area in India is irrigated.

The other approach to this problem is by improving the yield per acre, and the combination of the extension of cultivation and improvement of yield per acre. The utilization of old and the development of new manurial resources are first necessary. Cow-dung is an important source of manure, but nowadays most of it is used as fuel on account of scarcity of wood and other fuel in ru-

real areas. It is therefore desirable to plant trees for fuel supply in rural areas along roads, canals, etc. This will relieve pressure on cow-dung and increase supply of manure for the country.

Effort should be made to develop compost and green manuring and farm-yard manuring. It is encouraging to note that under recommendation of the Food Grains Policy Committee, the Government of India is starting a fertilizer factory to manufacture ammonium sulphate in Bihar with a capacity of $3\frac{1}{2}$ million tons every year.

Yield per acre can be increased by a proper selection of seeds, adequate supply of manure and a proper provision of water supply. According to Dr. Burns, Commissioner of Agriculture for India, the out-turn of rice can be increased by 10 percent with improved varieties and 40 percent by manuring. Further, he states that the out-turn of wheat can be increased 100 percent by improved varieties, adequate manuring, and proper control of disease and adequate water supply. A proper arrangement for distribution of improved varieties of seeds should be made through Government seed stores and cooperative societies.

It is desirable to point out that in the past much of the area in British India was under coarser and rough crops which are generally used by the poor. In the course of the last 20 years there has been a tendency to grow heavy-yielding, energy-producing, and protective foodstuffs. This tendency should be encouraged to the greatest possible extent to meet the national needs of the country.

A survey of various food crops indicates that the heavy-

yielding, energy-producing and protective crops, particularly wheat, are displacing the poor crops. Total percentage under rice and wheat increased from 25.5 percent in 1908-10 to 27.2 percent in 1937-39, though the percentage for rice alone has slightly decreased.

The area under low-yielding, less energy-producing, and coarse crops like barley, jowar, bajra, and maize has a tendency to decrease. In 1937-39 the area under these crops was 14 percent as against 16.9 percent in 1908-10. In a province like N. W. F., where the climate is cold, the tendency of these crops has been to undergo a complete change, and energy-producing crops like wheat have almost displaced poor and coarse crops, as jowar, bajra, and maize.

In other provinces, also, similar changes have taken place, though they are less marked.

CONSUMPTION OF WHEAT

Areas of Consumption

In the first place the consumption of wheat is largely restricted to the principal regions of production, namely, the Punjab, Northwest Frontier, and the United Provinces. Outside these provinces cities of Calcutta and Bombay are the main areas where wheat is consumed.

As such in many provinces and districts wheat plays little part in the diet of the people in those regions away from the actual areas of production. The following data covering the crops

of 1911-12 and 1914-15 show the approximate position of high production and consumption, before World War I, in the principal wheat-growing areas for a four-year period:

Table 6. Production and consumption of wheat before World War I in the main producing areas.

Province	: Crop, : mil. bu.:	: Export, : mil. bu.:	: Retention, : mil. bu.:	: 1911: Per capita : pop.: reten., bu.	
Punjab	127.8	36.8	91.0	20.7	4.4
United Province	103.7	16.1	87.6	45.4	1.9
Central Province	33.8	6.2	27.6	13.9	2.0
Bihar & Orissa	20.7	1.2	19.5	34.0	0.6

From the above it is apparent the Punjab is the one province of India in which wheat forms a general staple of consumption. Even there, the per capita consumption is considerably less than in the United States (4 to 4.5 bushels per capita as human consumption only). In a population which ate little meat, wheat is clearly of much greater relative importance in the diet.

The rate of consumption in the United Province and the Central Province is much lower than in the Punjab. These provinces contain large districts in which wheat is displaced by rice as the principal cereal. Even in the wheat-growing districts, many poor cultivators live largely on barley or millet, and raise small quantities of wheat as a commercial crop mainly for sale. In Bihar and Orissa the submergence of wheat by rice goes much further.

Another approach to study the consumption of wheat in different areas of India would be from the point of view of the diets

in the different provinces. Below are the diets of three provinces showing the cereal content in ounces:

Table 7. Cereal content in diets of different provinces.

Cereal	Punjab	Bombay	Madras
Wheat	14.9	5.1	---
Rice	2.5	3.7	16.0
Millst	--	1.5	---

From the above typical study it is observed that wheat is consumed most in the Punjab province, while in Bombay province it forms the greater part of diet in cooperation with rice. It is surprising to note its total absence in the food of Madras province. Wheat is not grown there and the transportation in India has always been a problem.

"With the population of omnivorous dietary habits, agriculture of a country tends to determine in very large measure diet of the population. This is true of particular regions of India, for there is a strong tendency for the population of this region to subsist on the products of that region, rather than to specialize in production and develop a more or less uniform diet by means of internal trade."

The above is the remark of Messrs. Wright and Davis of the Stanford University Food Research Institute, and no doubt in the present circumstances also it is justified to a large extent.

In some regions of India rice is the staple cereal; in others it is almost unknown. The same situation exists also when

wheat is concerned. The agriculture of India as a whole is determined or at least modified profoundly by the dietary habits of the population.

The consumption of animal products and also fish is very small. The protein requirements of the population are furnished by legumes and cereals. Fat-poor and fat-rich legumes, which are both rich in proteins, are extensively used in food and are thus of particular importance in the diet.

The most prominent cereals used in human food are millet, rice, and wheat. In relation to food values and food prices, millet is generally the cheapest. Out of the other two, namely wheat and rice, either of them may be dearer in a region where it is not produced.

Wheat is the richest cereal in protein, while millet is richest in calorie content. The use of cereal in diet varies from region to region, rice being consumed especially in coastal areas; wheat in interior and in Bombay, Calcutta, and Karachi; while millet is consumed by the poor throughout the country who cannot afford to eat rice or wheat.

In India not only the quality but the quantity of diet also depends in large measure upon the purchasing power, and therefore a form of subnutrition is found in certain groups of the population.

Per Capita Consumption

India's food consumption differs from that of most other countries, as we already have seen. The most important character-

Table 8. Consumption of wheat in India.

Year, Aug. 1 to July 31	Consumption						Popula- tion, millions
	Total		Human		Seed,	Animal feed & waste,	
	Mil. bu.	Bu. per capita	Mil. bu.	Bu. per capita	mil. bu.	mil. bu.	
1922-23	333.4	1.02	272.4	0.84	46.3	14.7	325.64
1923-24	332.3	1.01	270.6	0.82	46.8	14.9	329.03
1924-25	327.5	0.99	265.4	0.80	47.7	14.4	332.42
1925-26	323.0	0.96	264.1	0.79	45.7	13.2	335.83
1926-27	328.2	0.97	268.2	0.79	47.0	13.0	339.22
1927-28	326.5	0.95	264.8	0.77	48.3	13.4	342.61
1928-29	320.9	0.93	261.3	0.76	48.0	11.6	346.00
1929-30	320.2	0.92	259.9	0.74	47.5	12.8	349.39
1930-31	355.7	1.01	291.8	0.83	48.3	15.6	352.79
1931-32	365.4	1.03	300.8	0.84	50.7	13.9	356.18
1932-33	357.8	1.00	298.1	0.83	46.2	13.5	359.57
1933-34	352.4	0.97	287.9	0.79	50.4	14.1	362.96
1934-35	350.5	0.96	288.1	0.79	48.3	14.1	366.35
1935-36	357.0	0.97	295.4	0.80	47.1	14.5	369.74
1936-37	338.1	0.91	277.5	0.74	46.5	14.1	373.13
1937-38	356.2	--	--	--	--	--	--
1938-39	355.8	--	--	--	--	--	--

Source: International Yearbook of Agricultural Statistics.

istics of food consumption in India are as follows:

1. The average daily consumption of food in terms of calories is considerably lower. It can be said to be close to the subsistence level at a low level of health and efficiency.

2. Grain forms a larger percentage of the food. The percentage probably is 80 to 90.

3. Several different kinds of grain are excessively eaten in various parts of India.

Rice is the most important food grain in India. It forms half the grain used domestically on a cleaned basis. Wheat is of secondary significance. It forms one-fifth of the total cereal consumption. Millet, gram (chick-pea), barley, and maize account for about two-fifths of the food supply.

The Punjab is always specially mentioned as the place of greatest increase in consumption of wheat. There is no evidence of decrease of per capita consumption elsewhere in India. The increase has occurred chiefly in towns and to a small extent in larger villages. The principal reason given for the more recent increase is the higher earnings of urban workers and the fact that formerly and to a greater extent they consumed chiefly the cheaper and coarser food grains.

With a larger purchasing power in terms of food the consumption of wheat has increased, reducing the consumption of the cheaper and inferior grains. As will be seen in Table 8, the general trend of wheat consumption in India is one of increase along with constantly increasing population. This behavior of the trend can be well explained by the pronounced use of wheat

in place of coarser grains.

Requirement in a Well-Balanced Diet

The balanced diet has been defined as one necessary for the upkeep of the body and physical strength. Considering the calorie requirement for a person in India, we have at our disposal figures worked out by the Nutrition Research Laboratories, Coonoor, South India, to which Dr. W. R. Aykroid has contributed much.

For adult male in India, 2,600 calories per day.

For adult female in India, 2,100 calories per day.

For light work, 150-300 calories per hour of work.

For very hard work, upwards of 300 calories per hour of work.

In the U. S. A., 3,500 calories requirement per head is estimated.

The diets of the poor in India are below the standard adequate for health. Millions of people are living a hand-to-mouth existence. They are unable to get even a square meal a day. The result is underfeeding and undernourishment, which adversely affects the health of the people; these people are usually victims of epidemic or disease. The infant mortality is highest in India, and much labor is wasted due to ill health and sickness of the people. The infant mortality rate of some countries is compared in Table 9 by the rate of them in the cities.

Table 9. Infant mortality in India compared to other countries.

	Calcutta	Bombay	London	New York
Infant mortality rate per 1,000 live births	212.0	201.4	48.0	30.8

The Clerical Research Workers calculated that some hundred grams of protein were required daily for prosperous people. At present the view is that about 73 grams are enough, even for a hard-working man. There are two types of proteins--animal and vegetable; for us the vegetable proteins are here significant as they are supplied through wheat, rice, and other cereal. The balance of these proteins in the adjustment of a balanced diet is well illustrated by Dr. Robert Heiling in the case of a vegetarian diet most suitable for India (see Table 10).

Prof. R. Mukherjee and the others of the Bombay Plan of Reconstruction of India are of the opinion that the 800 calories, out of which 200 are wasted in the kitchen, are necessary for a balanced nutritive diet. According to the authors of the plan, the balanced diet in India should consist of the items mentioned

Table 10. Quantity of wheat recommended by different authorities for the balanced diet of India.

Authority	Cereals							
	Whole wheat		Hand pounded:		Millet		Total	
			rice					
	ozs.	gms.	ozs.	gms.	ozs.	gms.	ozs.	gms.
Dr. Heiling	5	18	7	17	7	14	19	49
Prof. R. Mukherjee: (Bombay Plan)	--	--	--	--	--	--	16	--
Dr. Aykroid	5	--	10	--	5	--	15	--
United Nations conference on food and agri- culture as a model diet	--	--	--	--	--	--	10	--

in the table.

Dr. Aykroid, who, incidentally, is an American and a director of Nutrition Research Laboratories at Coonoor, South India, also gives figures for a balanced diet which are compared in the table with the other two sets of figures by the authorities mentioned above.

The population of India, according to the last census in 1941, is 388.9 millions. As there is no recent record of the number of children and adults, the 1931 record is used. The derived figures from the 1931 census are as follows:

Table 11. Population of different age groups in 1941 calculated on the basis of 1931 census.

1931 population	: Children between ages of 0-15	: Ages of 15-50	: Above 50
	: 39.9%	: 50.5%	: 9.6%
1941 population on above basis	: 155.2 million	: 123.4 million	: 110.3 million

No considering the man-value of children below 15 as 7 percent, and females 15 and upwards as .83 percent, we find that the total man-value of the population is 321.59 millions. Considering the needs of the people on the recommendations of a balanced diet discussed elsewhere, the total requirements for wheat in terms of cereal are 48.9 million tons of cereals, or 16.3 million tons of wheat as at least a third part of cereals.

Possibilities of Increased Consumption

The future trend of wheat consumption in India can be pre-

dicted further in the light of the same behavior observed before, namely, of replacing the other coarser grains. At the same time it must be considered a fact that the increase in the consumption of wheat on the whole for India is limited, because of the fact that the need of wheat in the balanced diet of India is for a smaller quantity on the whole than it has been producing. Also, there is no doubt that it will be able, with improvements, to produce more in the future.

The consumption of wheat in India would be more closely limited on the basis of the country as a whole. The other articles of food required in the diet of India are being made available in larger quantities. India already has well chalked-out programs of development like the "Bombay Plan" referred to elsewhere. These plans are aimed at increasing the production of milk and milk products, vegetables and fruits, and greater availability of meat, fish, and eggs.

There is no scope for consumption of a greater quantity of wheat in India in the long run. Wheat will continue to displace coarser grains in the food of India in the form of increased per capita consumption of wheat.

MARKETING AND DISTRIBUTION OF WHEAT

Though many measures have been taken to prevent adulteration of commodities of ghee and oil, none has been taken in connection with staple foodstuffs so far. Hence, it is desirable to create adequate legal checks and take effective administrative measures for the prevention of adulteration of foodstuffs. Positive mea-

suree should be adopted to improve quality of foodstuffs and to maintain standards. For this purpose protective trademarks for articles of good quality should be used and the work of grading and testing carried on under Government control.

The development of means of transport is an essential requisite for the distribution of food and better prices to the producer.

The present roads, 300,000 miles, of which 74,000 miles are metalled and 226,000 miles are non-metalled, are quite inadequate to meet even the present requirements of the country. The country requires at least one mile of road for every square mile of area. The objective should be achieved by connecting all important villages with the main highways of trade so that no village with a population of 1,000 and over should be more than a mile or a half from a public road. There are 700,000 villages in India.

It is also desired to build railways at least 50 percent more. The Government should also try to find out possibilities of river transport and as far as possible it should try to co-ordinate various systems of transport in the country. The highways will help a good deal in procuring food.

On September 26, 1947, highway building in India was outlined in New York by K. S. Raghavaachary, deputy consulting road engineer, Government of India.

"During the next fifteen years it is planned to extend our present system of highways so that there will be a network to tap all of the principal communities and rural areas in India,"

he said, "we are particularly interested in what you term here 'the farm-to-market' routes. There is an acute need for these to assure steady outlets from our vast agriculture production, even though we have at present 260,000 miles of highways."

Marketing Facilities

Though most of the grains produced in India are consumed locally at the place of production, wheat to a large extent forms an exception to this rule. It comes to local markets from the producers to be purchased there for local consumption, for shipment to other parts of India, or to seaports for export.

Storage facilities are more or less lacking in India. One of the great factors standing in the way of modern improvements of storage facilities is the fact that cultivators tend to sell their crop soon after the harvest. Farmers have to pay their standing debts and irrigation charges (called water charges) and land taxes (called land revenue). Unfortunately, payment of land taxes and water charges falls shortly after harvest of the wheat crop.

But this does not go to prove that storage facilities are not necessary. The lack of storage facilities forces farmers to sell their crops very early, too. If the farmer possesses storage facilities, they are of a most crude type. These granaries are inadequate, and damage most commonly done to wheat in India results from exposure of grain to rain. If saved from monsoon damage, it falls a prey to damage from insects.

Storage facilities of grain dealers are also quite unsatis-

factory. Some exporting firms have large store sheds with floor and ground level. They are not well equipped and are used more to hold grain before shipment than for a real storage function. Few masonry store bins are found with arrangements for chemical treatment of grain by carbon disulphide, but these are more rare than common. The wheat is generally stored in jute bags or in layers on the floor. Due to humidity, insect damage increases during the monsoon season. During years of bumper crops wheat is stored by farmers in underground granaries called "khattis", lined with straw and chaff from inside.

The first movement of wheat for sale is from the village to a local nearby market. The farmer takes grain to the nearest market, if he is not bound to deliver it to the money-lender (such is not ordinarily the case), or if he is not obliged to deliver it to the landlord. The general practice of the poverty-stricken farmer, however, is to sell it to the village "bania", who is a store-keeper, grain dealer, and also a money-lender.

The owners of large estates in the Punjab deal directly with the exporting firms. More and more farmers are dealing with agents of these exporting firms. The village market is called "mandi". It is an open space surrounded by warehouses owned by various local dealers. Here on the ground large grain dealers, local warehousemen, and the representatives of exporting firms compete with one another for the purchase of grain, brought in bullock carts by the farmers.

Distribution and Political Effects

In 1933-44, a tightness in the food position of India was felt due to a scanty crop in the northern hemisphere. In the famine of Bengal during August to October, 1943, was the crisis when hundreds and even thousands of persons died weekly.

An idea of how food grain supply kept pace with the increase of population, during the past 12 fiscal years, is gained by examining Table 12, given in terms of pounds of grain per capita.

Table 12. Per capita grain supplies available from 1932 to 1938.

	: Per capita : supplies :		: Per capita : supplies :
Apr.-Mar. 1932	345	Apr.-Mar. 1938	302
33		39	
34	337	40	325
35	344	41	297
36	320	42	299
37	341	43	303
38	332	44	341

Source: T. W. Schultz, "Report of the American Famine Mission to India."

"The tightness apparent in the Indian food position during the past two or three years can be explained only partly in terms of reduced per capita supplies."⁸

There are other factors also which have helped to increase the deficiency of food grains, due to military mobilization, rising prices, expanded employment at increased wages, and depletion of market stocks of consumers' goods. To help meet critical shortages of grain in some of the areas, special efforts have been made since the spring of 1943 to import other grains than

⁸T. W. Schultz, "Report of the American Famine Mission to India," p. 11.

rice from available sources. The other grain available, of course, is wheat from abroad.

Towards ameliorating the poor condition of food grain supply, the recommendations of the Food Grains Policy Committee announced in September, 1943, did a good deal. The recommendations were as follows:

1. The export of food grains should be forbidden.
2. Import of 1.5 million long tons of grain should be secured in 1943-44 and annual imports thereafter of one million tons.
3. The supply of domestically grown foodstuffs (mainly cereals) should be increased by various means.
4. Food grains should be rationed at not less than one pound per adult per day, in all cities of 100,000 or more.

The progress towards avoiding the calamity has been great. By October, 1944, maximum prices were set for wheat, barley, gram, and millet. The ceiling price for rice had not been established. The actual imports of grain obtained from October, 1943, to July, 1944, were 649,039 tons.

To meet the shortage of food grain caused by failure of major crops over large areas and by war in India, many splendid efforts have been undertaken. Two of them deserve to be mentioned as commendably accomplished. Both of them come under the activity called "rationing" in India. One is directed at organizing the distribution of food grains, on a coupon basis, according to recommendations of the Food Grains Policy Committee. The other is the procurement of grains directly from farmers.

This direct procurement has been resorted to in view of the peculiar conditions in India. We may examine some of them below:

The lack of commercial production of food grains in India is very predominant. It can in no way be compared to the United States where farming is done mostly for sale. In India 85 percent of the people live in 700,000 villages mostly unencumbered by highways or railways, and carrying out a mere subsistence farming. The common pattern is for cultivators to use food grain output to meet fixed charges and feed the families. Ordinarily some of the yield is always delivered to the land owner as rent, to field laborers as wages, to money-lenders as payment of principal and interest, to village shopkeepers as payment for their bills, and to village serving classes.

The income elasticity of food grains is very wide. In normal times Indian farmers hold back greater quantities of food grain. Before the war the resulting deficit in grain was made up by imports. During this war the farmers, as a consequence, enjoyed prosperity, which also, unfortunately, came in the way of procuring grains through the market. Even though the direct procurement of grain from farmers was thought the best solution under the circumstances, the way to achieve it was not all easy. Some of the factors coming in the way of its execution are cited below.

The Government of India Act of 1935 was unfavorable to direct procurement of food by the Central Government. This was an administrative problem.

The set-up of village administration of different provinces is widely differing. The villages in India may be divided into

two main types according to the administration of them. They are called Ryotwari and Zamindari villages.

Ryotwari villages have a head-man called Patel and a revenue officer called Talati who are confirmed by the Government. In addition to innumerable duties they keep a record of area of land sown, yield obtained, etc., of crops and also other village statistics. The procurement of grain directly is made easy here, as they know the productive capacity of every farmer.

Zamindari villages are a result of the Permanent Land Revenue Settlement of 1793. The Government collects revenue from landlords, and the cultivator is of little consequence. Therefore, knowledge of every cultivator's productive capacity is not available.

Considering the production areas for wheat, most of them fall under the Zamindari village administration. The villages in the provinces of Punjab, United Provinces, Central Provinces, Bihar, and the Northwest Frontier Province can be classed broadly in the Zamindari administration. These provinces form almost all the area of wheat production except some in Bombay Province. The villages of Bombay and Madras provinces are classed in the Ryotwari administration. Of course, Madras Province is no wheat area. Rice is grown there.

The technique of compulsory procurement is important. Madras Province is typical of the Ryotwari and Bengal is typical of the Zamindari administration. Grain procurement in Madras is a compulsory program. Estimates of each farmer's produce are made, when

possible, from the village records mentioned above. A quantity of grain as family allowance until next harvest is calculated at the rate of 16 ounces of food grain per adult per day, with half the allowance for children. Other expenses in kind (grain) are reckoned, including rent, seed, and payment of field labor. These and his family allowance are deducted from his yield. A net surplus or deficit is thus calculated. In the case of a deficit the farmer acquires the right to go on the Public Ration Roll on the date his own stocks are expected to be exhausted. In the case of surplus, of course, the grain is procured directly by the Government.

Grain procurement in Bengal is a voluntary program. The trade continues to produce the bulk of annual output which reaches the market. At the end of June, 1946, the Government had purchased only 370 thousand tons out of an anticipated marketable crop of 4,500,000 tons. The management of food in Bengal is made difficult by the fact that records regarding production by cultivators at present are not available. The market machinery is partly monopolized by private traders.

Distribution of grain to the consumers is another problem. During the scarcity of food grains in India, public rationing of the grain has been introduced. There are two main types of rationing procedures, called "statutory" and "informal". The statutory rationing of rice applies to urban areas, while the informal applies to the rural areas. By legislation the Government provides a ration--now only 12 ounces per day per adult--to every ration card holder. Under informal rationing there is no similar legal obligation on either side. The Government issues licenses

to authorized grain shops. If supplies run short the Government may refuse technically to distribute grain even to ration card holders.

"The important point is not that rationing has not been 100 percent efficient in all areas. It is that rationing not only has worked but has worked extremely well in most of the country. The provident elements of population have slipped, as have all others, into complete dependence on Government Rationing System for their food."⁹

However, it may be added that only by such a type of distribution has it been possible to spread thin supplies of grain over the whole country and to avoid hoarding of grain and consequent starvation of the population.

The political situation as affecting the procurement and distribution of grain in India is important. It is encouraging to know that though legislative and administrative difficulties came in the way of central administration of India, in this respect, the work has been done very compromisingly and amicably. The same American mission quoted above declares "on the whole the subject of food has been commendably well kept outside the sphere of local parties. In major deficit areas this is particularly true."

EXPORTS AND IMPORTS OF WHEAT

India's Role in International Trade in Wheat

India holds a distinctive position among great wheat-growing lands of the world. It is a country of large production and con-

⁹T. W. Schultz, "Report of the Famine Mission to India," p. 20.

consumption of wheat and of a small and highly elastic exportation. The average wheat crop of India has been exceeded by that of only three countries, United States, Russia, and Canada. In wheat area harvested, India holds third place, with usually more than 30 million acres.

India frequently produces good crops of 360 to 380 million bushels and frequently mediocre crops of 310 to 330 million bushels. Occasionally, as in 1908 and 1931, there occurs a serious crop failure. The six crops, 1922 to 1927, which included no really poor ones, averaged slightly less than 350 million bushels.

Although per capita consumption of wheat is exceedingly small in India, except in the Punjab and among certain limited classes of population, the great bulk of crop is used at home. Even in good years some nine-tenths of the crop is retained for food and seed.

In the year of maximum exports (1904-05) the net exportation was only 23 percent of the crop; mediocre crops yield very small exportation and in years of poor crops a net importation sometimes occurs.

Although never a great exporter, India played a larger part in the world's wheat trade before World War I. India first became a factor in the world wheat trade in the 1870's after the opening of the Suez Canal. In the 1880's, with extensive use of iron steamships, the development of railway transportation in India, and radical reductions in the cost of transportation, her importance as a wheat exporter increased both absolutely and rela-

tively.

In 1904-05 the record total of 83 million bushels was reached. In this year and in 1912-13 Indian wheat furnished the largest contribution to the British market from any single source of supply. In five years before World War I, as a result of an unusual succession of good harvests, India's net exports attained their highest level, with an average of some 52 million bushels a year. Even this quantity, however, was a fraction of the world's export movement and was exceeded by the exports of America and other countries. The war gave no such stimulus to India's wheat production as it did in Canada and the United States, and caused no such decline in wheat growing as it did in many other countries. Acreage, indeed, expanded, reaching 35 million acres for the crop of 1918. However, the average yields were moderate and the consumption increased.

Exports, hindered by ocean-shipping conditions and at times restricted by governmental action, were on a lower level than before. Since World War I, except two years of good crops and attractive world prices, India's exports have been less than 10 million bushels a year.

In eight years after World War I India's net exports have averaged only 30 million bushels yearly, which is a very small contribution in comparison with those of great exporters--Canada, United States, Argentina, and Australia.

The great bulk of India's export goes by sea to northwest Europe; of this, the United Kingdom usually takes well over half. The small remainder goes chiefly to Egypt and to miscellaneous

destinations near India, much of which is consumed like India's export of flour by Indians abroad. The overland movement is practically insignificant.

In recent years price considerations have prevented export on any appreciative scale, since Indian wheat has rarely been cheap enough to compete with Australian, Canadian, or Argentine wheats in the United Kingdom markets.

During 1929-36, despite steadily increasing acreage, exports have been negligible, and from 1927-31 India was actually a net importer of wheat. Between 1927 and 1931 net imports averaged 3.8 million bushels a year. This ceased in 1931, when a small duty of 1 rupee per hundredweight was levied on imported wheat. This duty did not have the effect of raising domestic price much above the world prices, but it did to some extent redress balance between the Indian producer, who has to cope with expensive rail freight, and the overseas producer, particularly the Australian, who has the advantage of relatively cheap sea freight. The duty gave protection to Indian growers and assisted the Government in its campaign to maintain home production and so avoid the necessity for imports.

In 1938 the Indian Government decided to levy a new import duty on wheat and flour amounting to 1 rupee, 8 annas per hundredweight (\$45 per ton or about 28 cents per bushel). This was a hard blow to United States and Australian exporters, particularly to the latter, whose prospects in Europe looked like being compensated by liberal export movement to India.

At the end of 1936, in 1937, and 1938 India exported several

cargoes of wheat to Europe.

Year	1936-37	1937-38
Net exports	19 million bu.	18.8 million bu.

This export movement was due to the surplus stock and rising prices of wheat in the world market. This behavior of India's export movement is particularly noteworthy.

However, exports and imports in the space of 12 months are not an uncommon feature of the Indian wheat trade. The Indian merchant, who sells when the price is high, hopes that in a few months' time he will be able to repurchase at a lower price. If the price continues to rise he is badly caught. It is a fact that whenever wheat prices rise considerably, the Indian farmer or merchant takes out from his underground granary stocks of wheat which otherwise would never be available for export.

Forecast of India's contribution to international marketing during the international crop year, August to July, is far more difficult. Major portion of export, during August to July, is made from the subsequent crop which is not planted until autumn. The best one can do is to estimate the remaining exports from old crop, and April to July exports from new crop, assuming it to be of average size.

"Despite handicaps of small-farm production and relatively low percentage of land under wheat, India is the fourth largest producer of wheat in the world, and until recent years has been a considerable exporter."¹⁰

¹⁰Paul de Haysey, "The World Wheat Planning and Economic Planning," p. 521.

Commercial Importance

India normally stands forth among the world producers of wheat, though in some years, due to failure of Canadian crop, her position has been third. The largest producers of wheat in the world are, in order, as follows:

United States

China

Canada

India

The Indian production is about one-half of the United States.

The commercial significance of the Indian crop, however, is that it reaches the European market when crops of other countries are still growing.

Table 13. The time of wheat marketing in the main wheat-producing countries.

Country	Marketing time
United States (hard winter wheat)	July
Canada	Aug.-Sept.
Australia	January
Argentina	January
India	June

The demand for Indian wheat in Europe is mostly for mixing with other varieties of wheat to produce a large loaf. Most of the exports go to Great Britain, Belgium, Germany, and Italy. In the period of accumulation of world stocks and tariff restric-

tions all over the world, the export trade in Indian wheat was reduced considerably. The following chart gives the figures in tone of exports and their value in rupees (approximately one-third of a dollar) in the two periods 1927-28 and 1935-36:

Table 14. Varied exports from India, sampled by data of two different years.

Year	Export in tone	Value in rupees
1927-28	300,000	Rs 30,000,000
1935-36	9,000	900,000

There is not a large surplus of wheat in India or exports, as Indian requirements are almost equal to the produce. There is some trade in wheat flour also as an export. Indian wheat flour goes chiefly to Arabia, and the Straits Settlements.

The largest inland movement of wheat and flour is from the provinces where it is produced most, namely, the Punjab, Sind, U. P. and Central Provinces. The largest inward movement is into Calcutta, where a large wheat-consuming population has gathered from Northern India, Bombay, and Rajputana. Wheat produced here does not meet the local demand.

India's importance in the world market is due less to volume of her exports than to certain other factors, such as:

India's crop is harvested in March to May. Hence bulk of an exportable surplus, when one exists, becomes available to importers in the summer months at a time when other exporters have usually depleted their stocks and new wheat is not yet available from these sources, except at times from the United States, or

from certain European crops.

Indian wheat also enjoys especial demand in import markets, notably Great Britain, because its milling characteristics make it suitable for blending with Russian wheats, and because its extreme dryness renders it practically desirable for blending with wheat of high moisture content, especially with new British wheat, which is usually damp.

Characteristics of Export-Import Trade

Flour exports are usually small in comparison to wheat exports, though in occasional years of low wheat exports, as in 1900-01, 1919-20, and 1921-22, flour exports have been larger. In the middle 1890's, when statistics first became available, flour exports were equivalent to slightly over 1,500,000 bushels a year. They reached their peak in 1913-14 of 2,235,000 bushels. They remained heavy during World War I. Latterly they have averaged around three million bushels a year.

Flour imports have been negligible. Usually small quantities of wheat and flour have been imported.

Wheat imports usually have been about one million bushels. In 1918-19 imports surpassed two million bushels. This was due to imports made in anticipation of a poor harvest.

Australia is the natural source of imports. Australian wheat is available towards the end of India's crop year (April to May, when prices tend to be highest and the largest importations are usually made). In 1921-22, however, large imports were made in the closing months of 1921, and these came chiefly from the Pa-

Table 15. Export and import trade of wheat and flour in India.

Year	Total stocks on Aug. 1		Net exports of wheat and flour		Net imports of wheat and flour Mil. bu.
	Mil. bu.	Percent of world total	Mil. bu.	Percent of world total	
1922-23	30	4.7	28.6	4.0	
1923-24	35	6.1	20.1	2.4	
1924-25	55	7.8	38.1	4.9	
1925-26	50	9.1	8.0	1.1	
1926-27	50	7.8	11.5	1.4	
1927-28	55	5.2	8.5	1.0	3.8 ¹
1928-29	35	4.8	25.0	--	3.8
1929-30	30	3.0	0.6	0.1	3.8
1930-31	30	1.2	4.9	--	3.8
1931-32	70	6.8	2.0	0.2	3.8
1932-33	50	4.9	0.9	--	
1933-34	30	2.6	1.4	0.1	
1934-35	30	2.5	1.9	0.2	
1935-36	30	3.2	1.9	0.2	
1936-37	35	4.9	19.0	3.0	
1937-38	30	5.6	19.0	3.5	
1938-39	25	3.9	19.0	2.9	
1939-40			--		0.7
1940-41			5.9		
1941-42			9.7		
1942-43			0.9		
1943-44			1.2		
1944-45					1.0
1945-46					0.9

Source: International yearbook of April. Statistics. Statement supplied by the Government of India, Ministry of Agriculture, on request.

¹ Average figures for 1927-1931.

cific coast of the United States.

Factors governing yearly exports--(a) the volume of exports in a particular year is affected, not merely by size of current crop but by preceding and succeeding crops reflecting considerable but indeterminate adjustment of stocks. The largest exports are usually made from a large crop following one or more large crops and when a new crop also promises well, as in 1904-05, 1912-13, and 1924-25 (Table 15). India's high average of exports immediately preceding World War I was due to an unusually good margin of good crops in succession, ranging from 360 to 380 million bushels. After two or more large crops, exports may continue in a year or two of mediocre crops, as in 1925-26 and 1926-27, because of carry-overs. Exports are small for a good crop after a poor crop, as shown for 1920-21.

(b) Price relations to other grains and foodstuffs and also in relation to earnings or purchasing power. Whenever price between wheat and gram (chick-pea) or wheat and barley widens, wheat exports tend to increase and vice versa.

(c) Radical price changes sometimes occur. Exports in the summer of 1924 were moderate, in view of size of crop and lower prices, but a sharp advance in the international market called for unusually heavy exports from October to February, inclusive. India exports only when world price is high, since there is a sufficient home market to consume her entire production if prices are low, and of recent years (excepting 1936 and 1937) the world price has not been at a level to attract Indian exporters. This trend of wheat exports following the spread in world prices is

Table 16. Relation between spread in world prices and export movement of wheat from India.

Year	Av. an. export value of wheat in rupees per mound of 62½ lb.	Av. an. price of imported wheat in U. K. in shill. per quar-ter of 480 lb.	Total stocks in India on August 1	Percent of world total	Net exports of wheat and flour index no. of column (2) & Percent (3) on 1932-33 basis	Differen. of index no. of column (2) & Percent (3) on 1932-33 basis
1930-31	3.62	26.0	30	1.2	4.9	61
1931-32	2.75	22.5	70	6.8	2.0	59
1932-33	6.43	22.2	50	4.9	0.9	0
1933-34	5.81	19.1	30	2.6	1.4	4
1934-35	3.05	21.1	30	2.5	1.9	48
1935-36	3.06	28.45	30	3.2	1.9	81
1936-37	3.03	41.0	35	4.9	19.0	138
1937-38	3.06	42.0	30	5.6	19.0	142

Source: 1/ Statement supplied by the Government of India, Ministry of Agriculture, on questionnaire under their number.

2/ "World Wheat Planning," Paul de Havsey, Oxford.

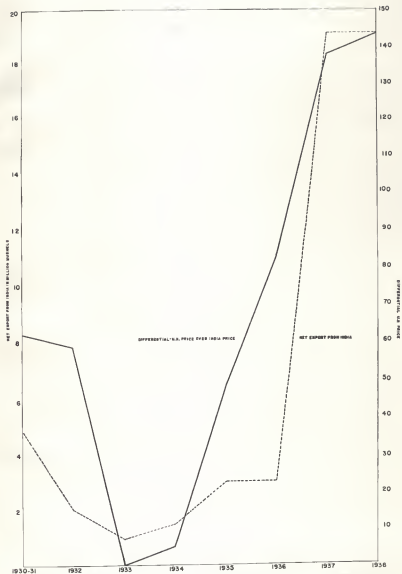


FIG 2. RELATIVE BETWEEN DIFFERENTIALS OF UNITED KINGDOM PRICE OVER INDIA PRICE AND NET EXPORTS FROM INDIA.

depleted by Figure 2 and in Table 16.

A moderate decline in exports has occurred in recent years. The reasons may be found among the characteristics of export trade as enumerated above.

1. Export takes place only when world price is high. This can be realized easily from the following:

Between 1929 and 1933, during the world slump, fall in wheat prices in India was approximately only 50 percent, as shown below.

Wheat (per 656 lbs.) at Karachi

Dec. 1929		Dec. 1930		Dec. 1931		Dec. 1932		Dec. 1933	
R	a	R	a	R	a	R	a	R	a
40	6	17	5	24	2	28	13	24	14

Therefore, exports have been drawn from India due to profits from price spreads between India and the outside world.

2. The population has been increasing far more rapidly than production.

3. The standard of nutrition is slowly improving, with a consequent slight increase in per capita consumption of wheat. The diversity of conditions in India is shown vividly in bulk of wheat consumption. Consumption varies from under four pounds per capita per annum in Madras to more than 250 pounds in Delhi.

4. The relation between price of wheat and that of two other cereal crops--barley and gram (chick-pea). It has been possible to buy wheat in competition with other grains.

SUMMARY AND CONCLUSIONS

Overpopulation, underproduction, and maldistribution are problems in India's economy. Small holdings are a handicap to production and are mostly uneconomic. There is a great pressure on land and there is no hope of relieving this pressure in the immediate future.

Parts of India are rainless and therefore irrigation projects are indispensable for crop production. Millet is a crop which is raised without irrigation. Population, though decreasing at a rapid rate, has increased to 50 million persons, or 15 percent, during the last decade. Approximately every eleventh year there is a season of drought followed by terrible famines.

India is rich in industrial resources and today ranks as the seventh industrial nation in the world. There is a deficiency of high-grade coal and mineral oil which is a handicap to industrial progress. However, there are great possibilities of hydro-electric plants and cheap electric power. The grid system, through such cheap power, is expected to aid the industries for India's 700,000 villages. This should allow a consolidation of many small plots of land into larger units, as more people will leave the land and work in factories.

Wheat is the second important grain crop in India, secondary to rice. Unlike rice, it is a commercial crop. The area of production is growing rapidly in all the provinces. The main species of wheat grown in India are vulgare and durum. The most common varieties found are melanopus and murciense, which are widely distributed and are prized for macaroni making in Europe.

Wheat is grown mostly in the alluvial soils of the Indo-Gangetic plain and the black cotton soils of the Peninsula, where rainfall is below 40 inches. The best land in India is divided among money crops like sugar-cane, cotton, and wheat. The allotment of the land to wheat further depends to a large extent on rainfall conditions. When rainfall is unfavorable, poorer crops like barley and grain occupy land which is otherwise allotted to wheat.

Indian wheat is used as a mixture for British wheat on account of its dryness. It makes the damp British wheat drier. The growth of wheat in India is helped by tillering in the cool temperature during its early growth. The crop ripens at the end of February in a hot temperature which helps in the process. Due to this sudden ripening in very hot temperature, Indian wheat obtains a drawback of shriveled-up grain.

There is an opportunity to increase the production of wheat by extending cultivation. Twenty-six percent of cultivable land is still available. However, this can be utilized only by having fertilizers, irrigation projects, farm-to-market routes, more railways, and eradication of malarial fever. Also there is still a great scope for increased production through improved varieties and greater yield per acre.

The consumption of wheat in India has a local character. It is consumed mostly in areas where it is grown. Punjab is the province where wheat is predominant in the diet of people. The retention of where there is large enough, 4.4 bushels per capita. In the United States the human consumption itself is about 4.5 bushels

per capita. In many wheat-growing regions producers live largely on barley or millet and raise small quantities of wheat as a commercial crop. The most important cereals used in human food in India are millet, rice, and wheat. In relation to food values and food prices, millet is usually the cheapest. Of the two grains, wheat and rice, either is cheaper in regions where it is grown. Per capita consumption of wheat is increasing and it is found that it is displacing coarser grains in the people's diet.

Grains are the chief article of diet in Indian food and are exaggerated in their use from the point of view of a balanced diet. India has been producing more grain and, for that matter, more wheat than is required in the balanced diet for India, in the opinion of nutrition research workers. This includes more milk, more vegetables, more fish and meat in the diet. But this is a policy to be kept as a long-range target and cannot be achieved immediately. Today India needs imports of grain which are mostly wheat.

Grading and inspection are not available for food products except "ghee", which is butterfat. Storage facilities are very crude and inadequate. Transportation means also are inadequate.

Marketing and distribution of food grains, especially wheat, require great improvement and support in India. Transportation should be increased to achieve better distribution of food. More highways and railways are required. Farm-to-market routes can do a great deal. Storage facilities are needed badly. Country elevators of modest accommodation can do a great deal in India. Elevators have not been developed because producers sell their

grain immediately after harvest, as they are pressed for money to pay standing debts, land tax, or irrigation charges. Moreover, it can be said that, due to lack of storage facilities also, the producer is unable to obtain better prices. The possibilities of working of country elevators in India under present conditions is a topic worthy of investigation.

Efforts to meet shortage of food grain in India, caused by failure of major food crops and war conditions, have been splendid. They are known as "rationing." Two things have been accomplished: one is the distribution of food grains on coupon basis to families and the other is direct procurement of grain from producer. There have been difficulties in accomplishing direct procurement of grain due to varying village administrations or political set-ups of different provinces. The distribution of grain to families on coupon basis has been very successful.

India has been a considerable exporter of wheat until recent years, and is the fourth largest producer. India exports when it has surplus stock and better world prices to gain by export. Exports and imports in a space of 12 months is not an uncommon feature of Indian trade. Forecasting of exports in a certain year is made difficult because the Indian crop year is different from international crop year--August to July. Exports during August to July are made from a crop which is not sown until autumn and the crop comes to market in April to July. An assumption of an average crop is to be taken for forecasting.

Indian wheat has a commercial importance in the export market in that it comes out in the summer months when there is no

other wheat in the world market. The peculiar characteristics of India's export trade have been that whenever better prices were available outside India, export of considerable quantities used to take place, provided it also had been a good crop year. In the absence of such price advantage, much of India's wheat was consumed in India itself.

In India not only the quality but quantity of diet depends upon purchasing power. The only surplus food product available in India has been grain, and whenever possible most of it has been consumed in that country. In a sense, therefore, India never has a genuine surplus of wheat. In years past, with normal crops, India has been an exporter of wheat as well as rice, barley, and grain. Previously, although at times export of wheat has been restricted in the country's interests, it has been thought better to export wheat than let it be consumed in India. Today the situation is different: India is requiring imports of wheat in considerable quantities; the population has been increasing.

The shortage of food in India is largely a shortage of food grains, as they form a substantial portion of Indian diet. During recent years India has gone through very serious famines of a nature probably unknown in history. Today, also, India is struggling to overcome the scourge of large-scale famine due to uncertain conditions of food supply or, in other words, supply of food grains.

The major food grain in India is rice, which is mainly dependent on irrigation. Only one-fourth of rice land in India is

irrigated. The present production of rice is not sufficient for India's requirements. According to F. A. O., India will need $3\frac{1}{2}$ million tons of rice in the year 1950-51.

	1946-47	1950-51
Production	28 million tons	
Import requirements		
Total requirements after taking into account normal in- crease in population		32.5 million tons
Import requirements		3.5 million tons

Also it seems that immediate increase of rice production by extending cultivation is not feasible. The Rice Study Group of F. A. O., after the conference in India, reported:

"The available information, on cultivable waste land in the undeveloped countries in southeast Asia, is neither complete nor very accurate. However, it can be stated, definitely, that in countries like India and China, with high pressure of population on limited areas, there are no large areas of really cultivable waste land that could be brought under cultivation by individual farmers in the near future. All the land, including, in many cases, the marginal lands, which it was within means of small subsistence farmer to cultivate, has been brought under cultivation. Any significant extension of crop area would require reclamation developments constructed at government expense."

The next important grain in India is wheat. This year again India is faced with the prospect of 25 percent less crop than normal. In such situations as this India needs imports, and imports

of grain can be only in the form of wheat.

The food situation in India can be realized from the following information for 1945-46:

	Rice	Wheat
Production	26,672,000	8,903,000
Export	29,000	
Import		362,000
Net available	26,643,000	

The Ministry of Agriculture, Government of India, has informed that during 1947-48 to 1951-52 they hope to have additional production of 2,127,700 tons of rice and 845,000 tons of wheat, due to the efforts for increased production in India. This speaks a great deal for the effort in India itself to supplement imports.

There is hope that India will be self-sufficient in the matter of food grains and also wheat. More irrigation facilities, improvements in crop and cultivation will bring an increase in production. Also more production of milk, vegetables, and meat will decrease need of wheat.

However, there is no chance, at least in the near future, that India will be an exporter of wheat. Apart from increase of population the progress of industries, for which India is well prepared, will increase home consumption of wheat.

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