Cereal Consumption, Production, and Prices in West Pakistan

by

G. C. HUFBAUER*

CONSUMPTION

In the late nineteenth and early twentieth centuries, several Punjab Settlement Officers attempted to estimate food consumption rates. These estimates, based on direct observation and *ad hoc* guesses, were made partly out of academic curiosity, but more urgently, as an aid in establishing the land revenue (*i.e.*, tax) rates. The pre-1926 estimates are summarized in Table I, expressed in pounds of wheat and other foodgrain consumption per person per year[1]. Broadly speaking, the later, more systemtic observers (*e.g.*, Sir Ganga Ram and C. B. Barry), found lower consumption levels than the earlier observers. It was generally accepted that the rural populace ate better than urban dwellers.

Despite the ingenuity of the early Settlement Officers, their compiled estimates suffer from all the difficulties of haphazard small sample observation. Given the revenue purpose of the estimates, they may be biased towards the able-bodied, economically active, population. Further, the very early estimates may have confused dry weight with cooked weight, including water.

Commencing in 1932/33, and continuing until 1954/55, the Board of Economic Enquiry sponsored foodgrain consumption estimates on a small, but relatively accurate basis. To begin with, accounts were kept of six tenant farmers in Lyallpur. Later, the coverage was extended to peasant proprietors, agricultural labourers, artisans, village moeens, and shopkeepers in Jullundur, Hoshiarpur, and elsewhere in the Punjab. These households were instructed in book-keeping methods. From the records kept by the household, the Board developed estimates of food consumption per "adult unit", that is to say, women

*The author is Economic Adviser, Planning and Development Board, West Pakistan. The views in this article are the personal opinions of the author and do not necessarily reflect official policy or position.

[1]The cereal foodgrains include wheat, rice, maize, barley, jowar, and bajra. Some of the consumption estimates in Tables I, II, and III may neglect the latter, relatively minor, cereals.

and children were calculated as fractions of an economically active male. The figures on cereal consumption, converted to a pounds-per-capita basis, are presented in Table II.

The data suggest considerable fluctuations in per capita consumption. Historical evidence indicates that year-to-year consumption changes before the Second World War bear some relationship to year-to-year production changes, especially after correcting for population growth. However, the post-War fluctuations in consumption and production bear no meaningful relationship to one another, possibly because of poor data, possibly because of the violent upheavals in subcontinental trade and consumption patterns which took place at the time of Partition.

The 1949/50 and 1950/51 Board of Economic Enquiry reports indicated higher urban than rural per capita consumption. Possibly the compulsory foodgrain requisition programme introduced during the Second World War and continued for some years thereafter reversed the "normal" differential between rural and urban consumption. In any event, the "normal" differential reasserted itself after 1951.

The third set of per capita foodgrain-consumption estimates stem from the random sample surveys constructed and administered with reasonable care by the Central Statistical Office, Department of Marketing Intelligence, and Directorate of Nutrition. These surveys differ in three important respects from the earlier estimates.

First, each survey covers several thousand West Pakistan households selected on a stratified random basis. This procedure ensures much more representative figures than *ad hoc* observation or the family budgets of ten or twenty households.

Second, these surveys cover all of West Pakistan, not just the Punjab. Greater prosperity in the Punjab than in the Sind or the N. W. Frontier may partly explain the lower figures obtained in these surveys than in the Board of Economic Enquiry or Settlement Officer reports.

Third, the methods of observation are quite different than casual observation or household booking used in earlier reports. The Central Statistical Office and Department of Marketing Intelligence conduct their surveys on a recall basis. Households were asked by the interviewer to estimate their food consumption during the past month. The Directorate of Nutrition, by contrast, employed the 24-hour weighing method. The interviewer weighs the dry ingredients of all food consumed by the family during a 24-hour period.

Of the two methods, the recall techniques probably suffer from greater overestimation. A comprehensive East Pakistan nutrition survey found

differences (on a small sub-sample) of more than 20 per cent between 24-hour recall of food consumption and 24-hour consumption as measured by food weighing (recall may suffer from less exaggeration if longer periods of time are covered, *e.g.*, one month). Even 24-hour food weighing may give an exaggerated idea of normal food intake, however, since a 5-per-cent difference was revealed in the same survey between 3-day and 24-hour food-weighing results [13].

With these qualifications in mind, to which must be added the difficulties of recruiting and training competent interviewers, the data in Table III are presented. The recall figures range from 407 to 456 pounds rural per capita consumption per year. The food-weighing method gave a substantially lower estimate at 385 pounds rural annual consumption. Both techniques reveal the "normal" differential between rural and urban consumption.

How do these consumption figures compare with foodgrain consumption in other countries? Table IV gives cereal consumption in selected countries. Evidently, West Pakistan already ranks among the highest foodgrain-consuming nations. Table IV suggests, in fact, that per capita foodgrain consumption falls with increasing economic development. This impressionistic suggestion has been borne out by FAO regression analysis of consumption patterns: in place of wheat and other cereals, the more affluent person eats sugar, meat and fish, milk and dairy products.

The nutrition survey reinforces the impression gleaned from international comparison. West Pakistan diets are not deficient in the sorts of nutrients provided by foodgrains. On average, cereal consumption in West Pakistan exceeds recommended intake levels by nearly 23 per cent. Probably only 10 per cent of West Pakistanis eat too little foodgrain from the nutrition standpoint. This is not to say that the West Pakistan diet is adequate. Overall, the diet is deficient in *all* foodstuffs *except* foodgrains. In terms of nutrients, West Pakistan receives too little calcium, riboflavin, vitamin A and vitamin C [14]. But these deficiencies will not be solved by eating more foodgrains.

If the foregoing argument is correct — namely, that from both the international standpoint and the nutrition standpoint, West Pakistan consumes nearly adequate amount of foodgrains — it follows that per capita income elasticity of foodgrain demand should be relatively low. A low elasticity is in fact suggested by cross-section consumption data.

Table V gives cross-section parameters derived from the 1963/64 National Sample Survey. Weighted consumption elasticities, both for physical intake and cereal expenditure, are calculated on the assumption that additional income is distributed as existing income. On this assumption, West Pakistan *physical* consumption of wheat and rice shows an elasticity of 0.15 with respect to income. *Expenditure* on cereal consumption shows a higher elasticity, 0.22,

because consumption shifts to rice, and better types of rice, as income increases.

Other observers have found nominally higher elasticity coefficients than the values suggested here. However, there is reason to believe that these coefficients can be partly reconciled with our findings.

In 1963, A.N.M. Azizur Rahman examined a sub-sample of 200 returns from the First Round of the National Sample Survey covering the year 1959 [11]. He found an *expenditure* elasticity for foodgrain consumption in rural West Pakistan of 0.44[2]. The elasticity in question, however, related to only a *part* of total expenditure. The neglected part of expenditure, together with savings, is among the most *income-elastic* components of the household budget. Since, in Rahman's exercise, foodgrain consumption was related to slower-growing expenditures, the elasticity coefficient is accordingly overstated. A rough correction suggests that the 1959 coefficient for foodgrain expenditure was actually about 0.33[3]. This is somewhat closer to the estimated *expenditure* elasticity of 0.22 found for 1963/64. The remaining discrepancy may result from sampling errors, different techniques of calculating elasticity coefficients (regression analysis vs. weighted average), and genuine differences in consumption behaviour between the two years.

The IACA consultants, relying on FAO studies, used an income elasticity coefficient of 0.55 [2]. The World Bank team borrowed this coefficient for its report [15, Annex 8.5].

The FAO foodgrain demand function is such that income elasticity declines with rising income and consumption levels. Hence, the relevant elasticity depends very much on the base-year consumption figure. IACA estimated 1965 West Pakistan foodgrain consumption at 276 pounds per capita. Although the IACA consultants corrected the official statistics for an understatement of 10 to 15 per cent, there is reason to believe that the official figures are understated to a greater extent than that[4]. Judging from the nutrition and sample surveys, consumption appears to be at least 365 pounds. At this level, the FAO demand function indicates an elasticity of less than 0.05 [2, pp.17-18]. Thus, once corrected for probably West Pakistan consumption levels, the IACA-World Bank coefficient is, if anything, less than our estimate for elasticity of physical intake.

---

[2]An elasticity of 0.51 was found for the Punjab and 0.43 for the non-Punjab area, using in both cases double-log regression equations.

[3]The estimated elasticity of expenditure, included in the 1959 Sample Survey, with respect to income, is about 0.75. Thus, the corrected cereal expenditure elasticity is about 0.33 ($0.75 \times 0.44 = 0.33$).

[4]Furthermore, the IACA consultants converted cereal production figures to flow figures (thereby deducting 10 per cent) although the FAO demand function is probably based on raw foodgrains statistics, not flow.

PRODUCTION

Table VI gives official cereal production statistics since 1956/57, and Planning Department forecasts for 1967/68 and 1968/69. The official production figures represent the joint effort of revenue *patwaris* and the Department of Agriculture. Early in the growing season, the *patwari* makes an estimate of acreage devoted to each crop. These figures may be subsequently modified by the Department in its production calculations. At harvest time, the Department of Agriculture takes sample cuttings to help determine yield. However, these cuttings by no means represent a carefully structured random sample, and in any event, the cuttings are not the final word, so it may be said that yield figures are judiciously "compiled" rather than estimated. Acreage is multiplied by yield to give official production estimates.

This acreage-yield approach suffers from certain pronounced defects. The revenue *patwari* system was devised by the British as the administrative arm of land tax collection. Land tax rates are determined, or "settled", with a view to three main factors: the amount of cultivated acreage, whether the acreage is irrigated, and the kind of crop grown. The farmer, therefore, wants to conceal, among other things, his cultivated acreage. To the extent the *patwari* collaborates in this effort, the acreage figures will understate the cultivated land area.

The yield figures, on the other hand, probably suffer from a bias towards "normalcy". Cuttings are only taken from supposedly average farms, and even cuttings which show yields much different than last year's are rejected. To the extent that yields are getting much better (or much worse) the "compiled" estimates will probably understate the change.

Table VI also gives import and export figures for wheat and rice. Trade data are available from various sources, but the most reliable source from the standpoint of physical movements is the Karachi Port Trust.

No one has a very good idea on the extent of seed and losses, and animal feed use, among the different cereals. The IACA consultants suggested a 12-per-cent seed and loss figure for wheat, 7 per cent for rice, and 9 per cent for other cereals. After very limited inquiries, we have adopted 5 per cent for rice and 10 per cent for all other foodgrains. IACA suggested that animal feed takes 20 per cent of maize and 50 per cent of barley, jowar and bajra. Other observers seem to think that barley is seldom used as animal feed, but that 70 per cent of jowar might go for this purpose. These proportions are used in Table VI.

With these assumptions, per capita net foodgrain-availability figures may be derived from the production, trade, and loss estimates. Because of

year-to-year inventory changes, no conclusive comparison can be made between availability in one year and consumption during that same year. However, even an average of several years gives no agreement between per capita availability and consumption. Generally speaking, the availability figures fall well short of the consumption estimates; even those taken by the more scientific sampling techniques. For example, the 1964 Nutrition Survey, carried out in December 1964, gives consumption figure 35 per cent above the 1963/64 availability figure.

A priori, the gap between production and consumption might be attributed *either* to overstated consumption estimates, *or* to understated production-cum-trade estimates. The evidence suggests considerable exaggeration in 24-hour recall of food consumption, but only moderate "demonstration effects" in 24-hour food weighing. Comparing food-weighing estimates and official production-cum-trade estimates, we believe that the discrepancy largely stems from understated production. A similar conclusion has been reached by others, notably Dr. D. M. Qureshi of the Planning Department who first drew attention to the discrepancy. Perhaps 5 or 10 per cent difference between the figures can be explained by exaggerated consumption; the other 25 or 30 per cent probably represents downward-biased official production figures.

This explanation received some support from the "objective" crop-cutting estimates carried out by the Department of Agriculture. These objective crop-cutting estimates must be sharply distinguished from the crop cuttings used in compiling the official production figures. The objective estimates result from a carefully controlled sample survey of harvest yields. The sampling method, which so far has been applied to wheat, rice, maize, sugarcane, and cotton, deserves a brief description[5].

A number of mauzas (*i.e.*, villages plus surrounding farmland) are selected from all of West Pakistan on a stratified random basis (the stratification refers to cultivated acreage per mauza). The survey team then goes to the selected mauza and chooses fields from the *patwari* roster on a random basis. A plot from each selected field, again randomly chosen, is harvested, threshed, and weighed.

The objective yield estimates for wheat and rice, where the experiments have gone on for six or seven years, are almost certainly superior to the official yield figures. Even so, there are two possibly important biases in the objective estimates.

[5]This description was supplied by Ty Sturdevant, Adviser to the Department of Agriculture, who has been highly instrumental in extending and perfecting the crop-cutting experiments.

First, the harvest yield from each plot may differ from the yield for the entire field. The same hand techniques are used by both the survey team and the farmer, but the survey team, working in a confined space, may not obtain the same results. Whether survey team breakage and trampling outweighs a more careful harvesting job remains a moot point. Fortunately, the Department of Agriculture now has underway some check surveys to ascertain the bias.

Secondly, there is the matter of border yields and moisture content. The sampling procedure is such that borders have a disproportionately small chance of inclusion in the harvested portion. Furthermore, the sample harvest takes place a week or so before the actual harvest, when the moisture content of cereals may be higher. To correct for the supposed upward bias, an arbitrary 10 per cent is deducted from the sample yields. However, a cursory check of the yields from border plots suggests that the upward bias on this count may not nearly reach 10 per cent. Whether moisture content makes a significant difference remains to be determined.

With these potential biases in mind, Table VII presents official and objective production estimates for wheat. The objective estimates in Table VII have been corrected by the 10 per cent deduction for supposed border-moisture bias. Furthermore, the objective estimates and the official estimates are equally affected by any understatement of acreage. Even so, the objective figures exceed the official estimates by 22 to 27 per cent. If the 10-per-cent border-moisture deduction is restored, and if the *patwari* underreports acreage by only 5 per cent, then conceivably the official wheat estimates are understated by 40 per cent. This is a fantastic figure and must not be taken too seriously. However, there is one further piece of extraneous evidence which suggests very substantial undercounting of wheat.

In Table VII, 1963/64 per capita consumption of various cereals, as measured by the National Sample Survey, is contrasted with 1963/64 net per capita availability. Practically the entire consumption-availability gap occurs in wheat: indicated 1963/64 wheat consumption is 337 pounds, while availability is 202 pounds per capita. Even if *all* the differences (42 pounds) between the 1964 Nutrition Survey food-weighing estimate of total cereal consumption (365 pounds) and the 1963/64 National Sample Survey estimate (407 pounds) is deducted from the wheat figure, the remaining wheat consumption, at 295 lbs., still exceeds availability by 46 per cent.

PRICES

Absolute foodgrain production statistics may contain a large margin of error, but our analyis of cereal prices assumes that the statistics reflect *changes* tolerably well.

In explaining price movements, it helps to know something about seasonal cropping patterns and the flow of traded goods. Wheat and barley are *rabi* crops, that is to say, they are harvested late in the fiscal year, around April-June. Rice, maize, jowar, and bajra, on the other hand, are *kharif* crops; their harvest period is towards the middle of the fiscal year, say October-December. Foodgrains reaching the market in any given fiscal year, therefore, probably depend on wheat and barley outturn of the previous fiscal year, and rice, maize, jowar, and bajra outturn of the current fiscal year.

Furthermore, wheat imports coming through Karachi Port probably tend to arrive late in the year when the domestic production situation has clarified. Owing to handling delays, it seems reasonable to suppose that late-arriving wheat imports mainly affect the market in the following fiscal year.

The main cereal export is rice, but small amounts of wheat are shipped to East Pakistan. The volume of exports is principally determined, not by the free workings of the market, but by the decisions of government. Presumably, then, the export volume partly depends on the cereal outlook: smaller exports if stocks are low, larger exports, if stocks are high. If this presumption is correct, then the volume of exports would primarily affect the carryover availability to the next fiscal year.

If the foregoing suppositions are correct, then foodgrain price movements should reflect year-to-year changes in partially lagged cereal availability. In other words, the cereal price change between 1963/64 and 1964/65 should depend upon the change in availability between those two years, where availability in 1963/64 is determined by current year (1963/64) rice, maize, jowar, and bajra production, and previous year (1962/63) wheat and barley production and net cereal imports.

One further refinement: per capita, partially lagged, foodgrain availability probably acts on relative, but not necessarily on absolute, cereal prices. Absolute prices depend, among other things, on the money supply and the tempo of economic activity. Relative prices—that is, cereal vs. all other prices —are more likely to respond to foodgrain availability.

Table IX presents the data for testing the influence of production on prices. The cereal price index was found by weighting the price indices for individual cereals by their 1956/57 physical availability. The price index for all goods except cereals was found by netting cereals out of the general wholesale price index.

In most years the appropriate negative relationship emerges between changes in foodgrain availability and changes in relative prices. However, there are three out of eleven years when a perverse (*i.e.*, positive) relationship

appears. Moreover, even in the well-behaved years, the relationship has an erratic quality. The most that can be said is that, taking the well-behaved years as a whole, relative prices appear to decrease by about 1 per cent for every 1-per-cent increase in per capita foodgrain availability. Such a relationship, coupled with prospective foodgrain availability in 1968/69 and 1969/70, suggests a price drop of 23 per cent during 1968/69 (by comparison with 1967/68) and a price rise of 14 per cent in 1969/70. Since the average price of wheat during 1967/68 will be about Rs. 23 per maund, this would imply, on the assumption of *constant* prices for all goods except cereals, an average price of about Rs. 18 per maund during 1968/69 and about 20.50 rupees per maund during 1969/70.

REFERENCES

1. Barry, C.B., *Rates of Food Consumption of Zamindars in the Tallagung Tehsil of the Attock District.* (Lahore: Board of Economic Enquiry).

2. Gibbs, Sir Alexander *et al., Programme for the Development of Irrigation and Agriculture in West Pakistan—Comprehensive Report*, Vol. 2-B. 1966.

3. Lal, Sardari, *Rates of Food Consumption of 71 Families of Tenant-Cultivators in the Khanewal Tehsil, Multan District.* (Lahore: Board of Economic Enquiry).

4. Pakistan, Central Statistical Office, *CSO Statistical Bulletin.* (monthly).

5. Pakistan, Central Statistical Office, *National Sample Survey (Second Round), 1960.* (Karachi: Central Statistical Office, 1962).

6. Pakistan, Central Statistical Office, *Pakistan Statistical Yearbook; 1965 and 1966.* (Karachi: Central Statistical Office, 1968).

7. Pakistan, Central Statistical Office, *Report of the National Sample Survey (Third Round), 1961.* (Karachi: Central Statistical Office, 1963).

8. Pakistan, Central Statistical Office, *Report on Quarterly Survey of Current Economic Conditions in Pakistan: Household Income and Expenditure, July 1963 to June 1964.* (Karachi: Central Statistical Office, 1967).

9. Pakistan, Karachi Port Trust. Mimeographed Statistical Data.

10. Pakistan, Ministry of Agriculture and Works, *Survey Report on Utilization of Agricultural Commodities.* (Karachi: Department of Marketing Intelligence and Agricultural Statistics, June 1962).

11. Rahman, A.N.M. Azizur, "Expenditure Elasticities in Rural West Pakistan", *Pakistan Development Review*, Vol. III, No. 2, Summer 1963.

12. United Nations, *Statistical Yearbook, 1966.* (New York: United Nations, 1967).

13. U.S. Department of Health, Education, and Welfare, *Nutrition Surveys of East Pakistan: March 1962—January 1964.* (Washington: US Department of Health, Education, and Welfare, May 1966).

14. West Pakistan Directorate of Nutrition Survey and Research, *Preliminary Report: West Pakistan Nutrition Survey, 1964-66.* (Lahore: Directorate of Nutrition Survey and Research, 1968).

15. World Bank Staff, *Water and Power Resources of West Pakistan,* Vol II, 1967.

TABLE I

"COMPILED" WHEAT AND OTHER FOODGRAIN CONSUMPTION ESTIMATES, PRE-1927

(Pounds per person per year)

Observer	Date	Government institutions		Rural population		Urban population		Total per capita
		Type	Per capita	Per adult	Per capita	Per adult	Per capita	
Mr. Purser	1883							574
Col. Wace	1883							486
Mr. Kitchen	1910ca							475
Dr. E. D. Lucas	1920				470			
Sir Ganga Ram	1923			547	415[b]	365	282[b]	388[a]
Prof. Stewart	1925			561				
N. C. Ahuja	1925ca				479			
C. B. Barry	1925			580[c]	440[c]	457[c]	354[c]	423[a]
Capt. C. J. Lodge Patch	1895-1925ca	Medical hospital	469					
Lt.- Col. A. W. Grieg	1900-1925ca	Prison inmates	644					
Col. Lindsay Smith	1925	Indian sepoys	616					
Sardari Lal	1926			593	450[b]			

[a]Assuming 80 per cent of population is rural, 20 per cent urban.

[b]Based on the relationship between per adult and per capita consumption estimated by Barry.

[c]Barry's "zamindars" are taken as representatives of the rural population, and "non-zamindars" as representatives of the urban population.

Sources: [1; 3].

TABLE II

SMALL SAMPLE SURVEY WHEAT AND OTHER FOODGRAIN CONSUMPTION ESTIMATES, 1932/33 — 1954/55

(Pounds per person per year)

Date	Board of Economic Enquiry Report No.	Rural population[a]		Urban population[b]		Total per capita[c]
		Number families	Per capita	Number families	Per capita	
1932/33	40	4	530			
1933/34	40	6	528			
1934/35	50	6	526			
1935/36	59	6	505			
1936/37	62	11	500			
1937/38	67	10	462			
1938/39	72	10	435			
1939/40	86	13	562			
1940/41	88	13	510			
1941/42	92	13	436			
1942/43	94	13	460			
1949/50	108	29	362	22	390	368
1950/51	118	28	356	20	382	361
1951/52	119	24	415	21	410	414
1952/53	121	29	430	20	398	424
1953/54	123	25	425	20	389	418
1954/55	127	28	458	22	434	453

Source: Board of Economic Enquiry publications as noted in the table.

[a] Rural population is taken to include families of big landowners, peasant proprietors, tenant cultivators, and agricultural labourers.

[b] Urban population is taken to include families of artisans, village moeens, and shopkeepers.

[c] Assuming 80 per cent rural and 20 per cent urban population.

TABLE III

SAMPLE SURVEY WHEAT AND OTHER FOODGRAIN CONSUMPTION ESTIMATES, 1959/60 — 1964

(*Pounds per capita per year*)

Survey	Date	Rural per capita	Urban per capita	Total per capita
Department of Marketing Intelligence	1959/60	407		
National Sample Survey, 2nd round	1960	426		
National Sample Survey, 3rd round	1961	456		
National Sample Survey, 4th round	1963/64	435	337	407
Nutrition Survey	1964	38.5	294	365

Sources: [5; 7; 8, physical consumption of "other cereals" and "baked products" was estimated from expenditure data; 10; 14].

TABLE IV

CEREAL CONSUMPTION

(*Pounds per capita per year*)

	Year	Cereal consumption
		492
Republic		472
		432
		419
	1961/62	380
Guatemala	1962	375
South Africa	1960/61	366
West Pakistan	1964	365[a]
Syria	1960/62	351
Madagascar	1960/62	350
Taiwan	1964	333
Poland	1960/62	328
	1961	328
	1964	324
	1963	320
	1960	318
	1963/64	311
	1965	306
	1962	292
	1964	289
		289
		280
		278
		275
		264
		264
Libya		261
Jordan		252
Brazil		250
Sudan	1960/63	250
Israel	1963/64	243
Spain	1963/64	232
Panama	1960/62	224
Ireland	1964	222

[a] From Nutritional Survey, Table III above.

Source: [12].

TABLE V

CEREAL CONSUMPTION ELASTICITIES FROM THE 1963/64 NATIONAL SAMPLE SURVEY

Monthly household income group (*Rupees*)	Proportion of income received by this group (*Percentage*)	Monthly per capita income (*Rupees*)	Monthly per capita food-grain outlay (*Rupees*)	Monthly per capita wheat and rice intake (*Seers*)
Less than 50	0.5	18.24	6.39	13.50
50—99	6.8	20.98	6.48	14.07
100—149	15.3	24.34	6.72	14.41
150—199	16.2	30.16	7.87	14.82
200—249	12.6	35.00	7.63	15.27
250—299	11.2	39.40	7.64	16.17
300—399	11.9	47.89	7.81	16.34
400—499	7.7	57.27	9.52	17.54
500—699	8.2	68.20	8.83	16.11
700—899	4.7	86.25	9.63	17.62
900 and above	4.8	132.57	9.93	16.22
Weighted consumption elasticities[a]			0.22	0.14

Source: [8].

[a]Income elasticities were calculated as between each income group. These elasticities were then weighted according to the proportion of income received by the higher group.

TABLE VI

OFFICIAL PRODUCTION STATISTICS, IMPORTS, EXPORTS, AND AVAILABILITY

(1000 tons)

	1956/57	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63
WHEAT							
Official production	3,581	3,508	3,845	3,847	3,754	3,963	4,104
Seed and losses (10%)	—358	—351	—385	—385	—375	—396	—410
RICE							
Official production	831	862	976	979	1,014	1,109	1,078
Seed and losses (5%)	—42	—43	—49	—49	—51	—55	—53
BARLEY							
Official production	114	157	158	137	118	114	122
Seed and losses (10%)	—11	—16	—16	—14	—12	—11	—12
MAIZE							
Official production	462	440	481	478	432	480	475
Animal feed (20%)	—92	—88	—96	—95	—86	—96	—95
Seed and losses (10%)[a]	—37	—35	—38	—38	—34	—38	—38
JOWAR							
Official production	255	183	212	229	217	244	247
Animal feed (70%)	—179	—128	—148	—160	—152	—171	—173
Seed and losses (10%)[a]	—8	—5	—6	—7	—7	—7	—7
BAJRA							
Official production	363	274	309	324	301	364	416
Animal feed (50%)	—181	—137	—154	—162	—150	—182	—208
Seed and losses (10%)[a]	—18	—14	—15	—16	—15	—18	—21
IMPORTS							
Wheat	544	626	650	773	1,100	699	553
EXPORTS							
Wheat	—9	—10	—5	—22	—6	—31	—37
Rice	—85	—135	—207	—207	—236	—157	—462
NET AVAILABILITY	5,130	5,088	5,512	5,612	5,812	5,811	5,479
WEST PAKISTAN POPULATION (*millions*)	42.0	43.0	44.0	45.0	46.2	47.4	48.6
PER CAPITA AVAILABILITY (*lbs.*)	274	265	281	280	282	274	252

(Contd.)

Sources: [2; 4, various issues; 6; 9; and estimates by the Planning and Development Board].

[a]The seed and loss proportion is applied after deducting for feed use.

TABLE VI—(*Concld.*)

	1963/64	1964/65	1965/66	1966/67	1967/68 forecast	1968/69 forecast
WHEAT						
Official production	4,096	4,518	3,854	4,266	6,000	6,200
Seed and losses (10%)	—410	—452	—385	—427	—600	—620
RICE						
Official production	1,173	1,329	1,296	1,343	1,400	1,800
Seed and losses (5%)	—59	—66	—65	—67	—70	—90
BARLEY						
Official production	109	116	82	87	103	100
Seed and losses (10%)	—11	—12	—8	—9	—10	—10
MAIZE						
Offical production	518	520	531	578	780	850
Animal feed (20%)	—104	—104	—106	—116	—156	—170
Seed and losses (10%)[a]	—41	—42	—42	—46	—62	—68
JOWAR						
Official production	234	288	270	273	290	250
Animal feed (70%)	—164	—202	—189	—191	—203	—175
Seed and losses (10%)[a]	—7	—9	—8	—8	—9	—8
BAJRA						
Official production	356	439	364	365	410	350
Animal feed (50%)	—178	—220	—182	—183	—205	—175
Seed and losses (10%)[a]	—18	—22	—18	—18	—21	—18
IMPORTS						
Wheat	834	1,481	674	1,565	1,400	200
EXPORTS						
Wheat	—7	—31	—16	—29	—30	—50
Rice	—338	—114	—435	—417	—450	—550
NET AVAILABILITY	5,983	7,417	5,617	6,966	8,567	7,816
WEST PAKISTAN POPULATION (*millions*)	49.9	51.2	52.6	54.0	55.4	55.9
PER CAPITA AVAILABILITY (*lbs.*)	268	324	239	289	347	313

Sources: [2; 4, various issues; 6; 9; and estimates by the Planning and Development Board].

[a]The seed and loss proportion is applied after deducting for feed use.

TABLE VII

OFFICIAL VS. OBJECTIVE WHEAT PRODUCTION ESTIMATES

(1000 tons)

Year	Official estimate	Objective estimate[a]	Difference
1960/61	3,773	4,759	26.1%
1961/62	3,910	4,889	25.0%
1962/63	4,123	5,043	22.3%
1963/64	4,118	5,023	22.0%
1964/65	4,546	5,741	26.3%
1965/66	3,854	4,869	26.3%
1966/67	4,266	5,421[b]	27.1%

Sources: [6] and Department of Agriculture's unpublished data.

[a]The objective estimates incorporate a 10-per-cent deduction for supposed moisture-border bias. The objective estimates differ from the official estimates only in respect of yield; acreage figures are the same in both cases.

[b]Modified in line with the lower, revised acreage estimates.

TABLE VIII

CONSUMPTION VS. AVAILABILITY OF SELECTED CEREALS

(Pounds per year)

	(1) 1963/64 Consumption per capita[a]	(2) 1963/64 Net availability per capita	(3) Column (1) as per cent of column (2)
Wheat	337	202	167%
Rice	35	35	100%
Other cereals	35	31	113%

Source: [Table VI; 8].

[a]Comparison with the Nutrition Survey suggests that these figures are exaggerated.

TABLE IX

CEREAL AVAILABILITY AND PRICES. INDEX NUMBERS OR PERCENTAGES

Year	Partially lagged per capita cereal availability[a]	Percentage change in availability	Weighted cereal price index[b]	Percentage change in cereal prices	Percentage change in price of all goods except cereals[c]	Relative change in cereal prices[d]	Ratio: relative price change to availability change[e]
1956/57	222		92.9				
1957/58	265	19.4%	95.8	3.1%	6.8%	—3.7%	—0.2
1958/59	267	0.8%	95.9	0.1%	—3.6%	3.7%	(g)
1959/60	275	3.0%	100.0	4.3%	8.9%	—4.6%	—1.5
1960/61	272	—1.1%	109.2	9.2%	3.3%	5.9%	—5.4
1961/62	282	3.5%	102.8	—5.9%	1.9%	—7.8%	2.2
1962/63	267	—5.3%	98.5	—4.2%	—0.8%	—3.4%	(g)
1963/64	250	—6.4%	107.8	9.5%	1.3%	9.2%	—1.4
1964/65	271	8.4%	116.8	8.3%	6.3%	2.0%	(g)
1965/66	313	15.5%	107.3	—8.2%	4.5%	12.7%	—0.8
1966/67	236	—32.6%	157.4	46.6%	—0.8%	47.4%	—0.7
1967/68	291	23.3%	142.0	—9.8%	—0.7%	—9.1%	—0.4
1968/69	359[f]	23.4%	n.a.	n.a.	n.a.	(—23.4%)[h]	(—1.0)h
1969/70	308[f]	—14.2%	n.a.	n.a.	n.a.	(14.2%)[h]	(—1.0)h

Source: [4, various issues; 6].

[a]Wheat and barley production, and net imports, from the previous fiscal year; rice, maize, jowar, bajra for the current fiscal year.

[b]The following weights, based on physical availability in 1956/57 (*cf.* Table VI) were used: wheat 7 per cent; rice 14 per cent; barley 2 per cent; maize 7 per cent; jowar 1 per cent; bajra 3 per cent.

[c]Calculated from the general index of wholesale prices by netting out the change in cereal prices (weighted at 25 per cent of the general price index).

[d]Calculated by substracting the change in non-cereal prices from the change in cereal prices.

[e]Calculated as: (Relative Change in Cereal Prices). (Change in Availability).

[f]Based on production estimates of the Planning and Development Department.

[g]In those years, the ratio is perverse, that is, availability and relative prices go up (or down) together.

[h]Based on an assumed ratio of —1.0, which is reasonably close to the average ratio for well-behaved years since 1956/57.