Notes & Comments

Aggregative Analysis of Food Consumption in Pakistan

by

MOHAMMAD IRSHAD KHAN*

In this study we shall examine the influence of the major determinants of food consumption, *viz.*, level of per capita income, price structure, differences in preferences and availability of commodities. We shall analyse the consumption pattern as revealed by consumer survey as well as food balance-sheet to point out any inconsistency between consumption as reported by consumers and availability of food as shown by food balance-sheet.

I. ANALYSIS OF FOOD CONSUMPTION IN EAST AND WEST PAKISTAN

a) Consumer Survey

Table I shows the per capita per day intake of food in East Pakistan during the period from March 1962 to January 1964 along with the percentage contribution of various foods in the total food intake, as revealed by the nutrition survey of East Pakistan [14].

The survey data show that *i*) the starchy-staple ratio is very high at 86 per cent, *ii*) the consumption of protective foods is very low (2.5 per cent), *iii*) the consumption of milk, meats, eggs and fruits is negligible, and *iv*) pulses and nuts are the major protective foods although their consumption is not very significant (only 4.8 per cent of the total calories are supplied by pulses and nuts). In the starchy-staple ratio, rice is the major item contributing about 93.4 per cent of the calories derived from starchy-staples [14].

*Dr. M. Irshad Khan is a Research Economist at the Pakistan Institute of Development Economics, Karachi. This paper is derived from Chapter III of his Ph.D. thesis entitled "Economics of Food Consumption in Developing Countries: A Case Study of Pakistan" which was submitted to the Department of Economics, Stanford University (U.S.A.) in 1969. He is deeply indebted to Professors Bruce F. Johnston, Alan S. Manne and Koji Taira, all of Stanford University, for their comments on the thesis drafts. He also wishes to acknowledge helpful suggestions made by Dr. Hiromitsu Kaneda, and Dr. Azizur Rahman Khan, Research Adviser and Research Director respectively at the Institute. No one except the author is, however, responsible for any errors or omissions in this paper.

TABLE I

PER CAPITA PER DAY INTAKE OF FOOD IN EAST PAKISTAN (BASED ON CONSUMER SURVEY) (March 1962 — January 1964)

Food groups	Quantity		Calories	
	Grams	%	No.	%
Cereals	527.9	63.2	1.872	84.2
Starchy roots	54.3	6.5	33	1.5
Sugars and sweets	7.6	0.9	19	0.5
Pulses and nuts	27.9	3.3	107	4.8
Vegetables	134.6	16.1	41	1.8
Fruits	10.6	1.3	3	0.1
Meats	6.4	0.8	10	0.5
Eggs	1.7	0.2	3	0.1
Fish	33.3	4.0	46	2.1
Milk and cheese	19.2	2.3	17	0.8
Fats and oils	6.6	0.8	56	2.5
Miscellaneous	4.9	0.6	14	0.6
All goods	834.7	100.0	2,224	100.0
Starchy-staples[a]	582.2	69.7	1,905	85.7
Protective foods[b]	233.7	28.0	227	2.5

Source: [14, Pp. 210-216 and 219].

N.B.: The report gives data for rural and urban areas separately. We have obtained the data for East Pakistan as a whole by calculating a weighted average, the weights being 0.948 for rural areas and 0.052 for urban areas, as revealed by the 1961 Census of Population in Pakistan [15].

[a]Cereals plus starchy roots.

[b]Pulses, nuts, vegetables, fruits, meats, eggs, fish and milk.

We compare in Table II the consumption of selected food items in 1963/64 in the two provinces of Pakistan, as revealed by the *Quarterly Survey of Current Economic Conditions in Pakistan* [13]. The per capita consumption of all food items, except rice and fish, is higher in West Pakistan than in East Pakistan. The following points of interest emerge: *i*) in both wings, an average person consumes roughly an equal amount of superior grains (rice and wheat); *ii*) milk consumption is four times larger in West than in East Pakistan; *iii*) the per capita consumption of sugar in West Pakistan is almost four times higher than in East Pakistan; and *iv*) the consumption of fats and oils in West Pakistan is about double the level in East Pakistan.

TABLE II

MONTHLY PER CAPITA CONSUMPTION OF MAJOR FOOD ITEMS IN EAST AND WEST PAKISTAN (BASED ON CONSUMER SURVEY) (1963/64)

Food items	East Pakistan	West Pakistan	West/East
	(*seers*)[a]	(*seers*)[a]	
Rice and Wheat	14.79	15.07	1.02
Rice	13.85	1.40	0.10
Wheat	0.94	13.67	14.54
Pulses	0.42	0.75	1.78
Potato	0.22	0.40	1.82
Sugars	0.29	1.09	3.76
Meats	0.30	0.48	1.60
Fish	1.01	0.06	0.06
Milk	0.96	3.90	4.06
Fats and oils	0.21	0.49	2.33

Source: [13, Pp. 104-105 and 146-147].

[a]One seer is equal to 2.057 pounds or 933.1 grams.

b) Food Balance-Sheet

In Table III, we show the per capita per day consumption of aggregate food in Pakistan during 1960/61 to 1962/63, as revealed by the food balance-sheet prepared by the FAO [4]. According to the food balance-sheet, one person in Pakistan consumed, on the average, about 865 grams of food and obtained 2,090 calories a day during the period 1960/61 to 1962/63.

TABLE III

PER CAPITA PER DAY CONSUMPTION OF FOOD IN PAKISTAN (1960/61 — 1963/64)

Regions	Grams	Calories
Pakistan (1960/61 to 1962/63)[a]	865.2	2,090
East Pakistan (March 1962 to January 1964)[b]	834.7	2,224
West Pakistan[c]	901.1	1,933

Source: [a] [4].

[b] [14].

[c] Aggregate food consumption for West Pakistan is not available from any independent source. The figures given here are derived on the basis of the following formula

$$C_W = \frac{C - \theta_E C_E}{1 - \theta_E}$$

where C_W = per capita food consumption in West Pakistan.

C = per capita food consumption in all Pakistan.

C_E = per capita food consumption in East Pakistan.

θ_E = weight of the East Pakistan's population in the total population of Pakistan.

We take $\theta_E = 0.54$ as revealed by the 1961 Census of Population in Pakistan [15, p. 7].

Since we do not have any regional food balance-sheets, we derive the per capita intake of food in West Pakistan from the national balance-sheet residually by using the independent information about intake in East Pakistan available from the nutrition survey. It should be emphasized that since East Pakistan intake figures are independently estimated, the regional balance-sheets are indirect estimates and not necessarily consistent with what one would find if the balance-sheets were directly estimated for the regions. We see that per capita food intake in East Pakistan is slightly less than the national average but the calorie content of food in East Pakistan is higher than the calorie content of

food in the nation as a whole. In other words, a West Pakistani consumes more tonnage of food than an East Pakistani but obtains less calories. This, however, is inconsistent with the Quarterly Survey data which show that an average West Pakistani consumes more of every food group so that his calorie intake would also be more. The Quarterly Survey finding is more consistent with the usual expectation, since a West Pakistani has higher per capita income[1].

Since the alternative sources of data give conflicting results, it may be worthwhile to examine their relative reliability. It seems that the FAO food balance-sheet underestimates the per capita availability of food in Pakistan either because of faulty production data and/or because of faulty population figures. The sample-survey data for East Pakistan may also be overestimates of the food intake in East Pakistan because of sampling biases and people's tendency to hide their hunger or to show their menu respectable. As a result, the residually derived West Pakistan figures in Table III are perhaps seriously underestimated.

The inconsistency observed in Table III, however, is likely to be the result of faulty production figures for food items with high-calorie content per unit of a given weight, which loom large in the food balance-sheet and consumer budgets. We must, therefore, analyse the consumption of individual food items. The relative importance of various food items can be analysed either in terms of the grams of food consumed or in terms of the calorie contribution of various foods. The energy content (measured in terms of calories) of a food item is considered to be a better criterion than weight for judging the importance of any food item [2, p. 71]. Table IV shows that cereals are, by far, the major source of food supply for the people of Pakistan; their contribution is 49 per cent in tonnage and increases to 72 per cent in calories obtained. Among cereals, rice and wheat are the two most important items[2]. Rice is the main food crop and

---

[1]The per capita income in East Pakistan was 265 rupees in 1959/60 compared to 343 rupees in West Pakistan during the same period, *i.e.*, West Pakistan had 29 per cent higher per capita income than East Pakistan. The true disparity is, however, 60 per cent or more if adjustments for the price differentials in the two wings are made, *see* [5, Pp. 91-94].

The requirement of food for an average person is also higher in West than in East Pakistan because of differences in body-size, body-weight and the climate in the two wings of Pakistan.

a) Body differences: West Pakistan has four ethnic groups of people: (1) The Pathans are tall and well built; (2) the Punjabis are of medium to tall stature; (3) the Baluchis are all of medium to tall stature but slender and muscular built; and (4) the Sindhis are of medium height, stocky and well built. On the other hand, East Pakistan is ethnically homogeneous; East Pakistanis are short and thin [21, Pp. 55-67].

b) Climatic differences: East Pakistan is wet, humid and warm while West Pakistan is dry, arid or semi-arid, extremely hot in summer and cold in winter. For further details, *see* [1, Pp. 9-16 and 17, Pp. 52-67].

[2]Rice contributes 66 per cent of the calories provided by cereals while wheat contributes 28 per cent [4].

the main staple food in East Pakistan while wheat is the main food crop and the main staple food in West Pakistan[3].

TABLE IV

AVAILABILITY OF FOOD PER CAPITA PER DAY IN PAKISTAN (BASED ON FOOD BALANCE-SHEET) (1960/61—1962/63)

Food items	Quantity		Calories	
	Grams	%	No.	%
Cereals	423.1	48.9	1,510	72.3
Starchy roots	12.7	1.5	9	0.4
Sugars	42.0	4.9	149	7.1
Pulses and nuts	14.9	1.7	52	2.5
Vegetables	50.7	5.9	11	0.5
Fruits	79.5	9.2	45	2.2
Meats	9.8	1.1	18	0.9
Eggs	1.1	0.1	2	0.1
Fish	8.6	1.0	5	0.2
Milk	208.0	24.0	156	7.5
Fats and oils	15.2	1.8	134	6.4
All foods	865.2	100.0	2,090	100.0
Starchy-staples[a]	435.8	50.4	1,519	72.7
"Protective" foods[b]	372.6	41.9	289	13.8

[a]Cereals plus starchy roots.

[b]Pulses, nuts, vegetables, fruits, meats, eggs, fish and milk.

Source: [4].

[3]"Rice occupies the largest area and yields the highest tonnage of all crops in the country (Pakistan). East Pakistan claims over 90 per cent of total acreage and production. Wheat is the second largest crop in order of importance. The main growing area (for wheat) is the Punjab with 77 per cent of total production" [1, Pp. 29-30].

The second major food is milk followed by fruits, if considered in terms of tonnage; in terms of calories, however, milk is followed by sugars, fats and oils, and pulses and nuts.

The starchy-staple ratio is 73 per cent for Pakistan which is very high compared to 24 per cent for the United States [20, p. 4]. The per capita consumption of protective foods[4] in Pakistan was about 373 grams per day during 1960/61 to 1962/63 or 42 per cent of the total tonnage consumed. These foods, however, have a very high water content and, therefore, they yielded only 289 calories per capita per day or 14 per cent of the total calories consumed during the above period.

c) The Consistency among Alternative Sets of Consumption Data

In the above, we have discussed three sources of consumption data: *a*) food balance-sheet data for the nation as a whole prepared by the FAO from the production and population statistics; *b*) consumption estimates from the quarterly survey of current economic conditions for the nation as a whole and separately for East and West Pakistan; and *c*) nutrition-survey data for East Pakistan only.

We have indicated above that the three sources cannot be reconciled.

i) Source *b*) would give a higher consumption figure for cereals than source *a*) and this discrepancy would be much greater for West Pakistan than for East Pakistan.

ii) Source *c*) would indicate a higher consumption figure for cereals than source *b*) in East Pakistan.

When one considers the question of relative reliability of the three sources of data one feels very unsure. It, however, appears that the food balance-sheet and production statistics for cereals are almost certainly underestimated in view of the consistently and significantly lower figure that they provide as compared to the consumption survey and nutrition survey. We also do not have any evidence that the method of estimating production data is superior to the methods employed in the two surveys. It also seems certain that the underestimate in cereal production data is much greater for West Pakistan than for East Pakistan. This serious underestimation for wheat production in West Pakistan has already been noted by Hufbauer [6] and Irshad Khan [7]. Following the same methodology as in these studies we, however, do not find that the underestimation in East Pakistan is nearly as serious — actually Irshad Khan's findings [7] show that 1963/64 East Pakistan's rice-production figure may have been overstated.

[4]The protective foods are milk, eggs, fish, pulses, fruits and vegetables [3, p. 74].

Our findings regarding underestimation of wheat production and overestimation of rice production have serious implications for the disparity in income of the two wings of Pakistan. If one adjusts for the underestimation in the wheat production in West Pakistan, the income disparity between the two wings will be greater than what is apparent. Similarly, the adjustment for the overestimation of rice production in East Pakistan will enlarge the apparent disparity in income of the two wings of Pakistan. It is, however, beyond the scope of this paper to show the extent of disparity which is likely to emerge after proper adjustment for the underestimation and/or overestimation of production of the major foodgrains.

d) Factors Affecting Food Consumption in the Two Wings

The differences in the pattern of food consumption in the two wings of Pakistan should be explained in terms of the regional differences in preferences, level of per capita income, and food-production possibilities, food imports, *etc.*, reflected in the existing price structure. We shall analyse these factors.

i) Preference

The rice-eating population is considered to be faithful to its "staff of life" and generally sticks to rice even when its income rises [8, p. 720]. The population in East Pakistan is rice-eating and seems to have a strong preference for rice. The preference for rice in East Pakistan may be a determinant of food consumption but it cannot be the sole explanation of preponderance of rice in an East Pakistani's diet.

ii) Income

Cereals and potatoes (starchy-staples) "are ordinarily throughout the world the cheapest per thousand calories and poorest population groups . . . depend upon the starchy-staples for their food" [2, Pp. 72-73]. The poverty argument is valid as far as cheapness of grains is considered. But there are food items which are cheaper than grains and within cereals there are grains which are cheaper than rice or wheat [8, Pp. 718-719]. Low income may explain the high starchy-staple ratio but not the preponderance of rice or wheat in the food intake. For example, rice is an expensive cereal in East Pakistan in comparison to wheat or other cereals but it predominates the food intake of an average East Pakistani.

iii) Production Possibilities

In a peasant economy where there are too many labourers, each spending too little labour in the production process, the marginal productivity of the labourer "is nil over a wide range and the productivity of labour may be just equal to zero at the margin" [18, Pp. 13-15]. Under such circumstances,

food-growing activities would be given priority because food is the basic necessity. Unpredictability of relative prices in future, greater risk aversion on the part of people with very little to fall back upon, small farm sizes which prevent specialization and realization of any discernible economies of scale, the daily need for food, all combine together to force the farmer in Pakistan to give priority to the production of food for his family. And priority given to food leads the farmer to devote much of his land for the production of food. He devotes more land to the production of cereals rather than any other food presumably because the cost of production of cereals is the lowest per calorie produced. But the fact that milk consumption is important shows that cattle are reared in spite of the high cost of production of milk. They are not, however, reared for slaughter.

The primary motive of rearing cattle in Pakistan is the supply of milk and power. Cattle are slaughtered only when they do not produce milk and are too weak to pull farmer's cart or Persian wheel. A significant proportion of cattle, however, die before reaching a slaughter house. Many farmers, being poor as they are, keep milk and draught animal till the end of the animal's life. Hence, the supply of meat is reduced below the level which would be normally available even if only retired animals were slaughtered. Another important factor reducing the supply of meat is the poverty and smallness of Pakistani villages which cannot probably consume a big animal in one day. With no means to prevent the meat from spoiling, the demand for meat in a poor and/or small village may not be big enough to make the slaughter of a big animal profitable. The population pressure on land in East Pakistan may also be significantly responsible for low meat consumption in East Pakistan.

Rice is an expensive cereal in East Pakistan. The nonavailability of wheat in most parts of East Pakistan, specially in rural areas, may be an important factor in perpetuating the preponderance of rice in the diet in East Pakistan. Besides, rice is preferred for a number of reasons of which the most notable are: *i*) rice is easiest to cook; *ii*) it has advantage over wheat flour in respect of storage in the damp and waterlogged climate of East Pakistan; *iii*) lack of flour mills in rural areas; *iv*) the East Pakistani housewives are generally ignorant of the techniques of making wheat dishes; *v*) weak teeth and gum because of lack of calcium and phosphorus in the diet[5]; and *vi*) ignorance or superstition regarding the digestibility of wheat and its capability to satisfy hunger[6].

---

[5]Calcium and phosphorus are the two "prominent ingredients of the chief tooth mineral" [19, p. 298].

[6]Many people in East Pakistan seem to have a belief that wheat bread is not easily digestible. And, because of the lack of heaviness felt in the stomach right after eating wheat bread, many people accustomed to such heaviness feeling right after eating boiled rice think that their hunger is not satisfied although they consume the same amount of calories when they eat an equal amount of wheat.

II. SUBSTITUTION OF WHEAT FOR RICE IN EAST PAKISTAN

The limited evidence that we have at our disposal shows that wheat can replace a significant proportion of rice in East Pakistani's diets provided wheat is available. In Table V, we show the per capita consumption of wheat and rice along with their relative price ratios for four periods in 1960's.

TABLE V

PER CAPITA PER DAY CONSUMPTION OF RICE AND WHEAT IN EAST PAKISTAN (1960-1964)

Period	Wheat (grams)	Rice (grams)	Wheat as per cent of rice	Ratio of the retail price of rice to that of wheat (at Dacca)[e]
1960 (Jan. - Dec.)[a]	16.9	468.3	3.6	1.16
1961 (Jan. - Dec.)[b]	3.1	506.9	0.6	1.26
March 1962-Jan. 1964[c]	19.9	495.1	4.0	1.95
July 1963-June 1964[d]	29.8	430.7	6.8	1.70

Sources: [a][10, p. 34].
[b][11, p. 54].
[c][14, Pp. 211 and 214].
[d][13, p. 104].
[e][12, Pp. 368-369].

N.B. : The price ratio does not correspond to the exact period of the surveys. The periods for the price ratios are: July-June 1959/60, 1960/61, 1962/63 and 1963/64.

The above table shows that wheat consumption has a rising trend and rice consumption has a falling trend after 1961 although the ratio of the price of rice to that of wheat has no consistent trend. The substitution might, however, be due to a shift in the supply curves, the demand curve being stable. We cannot, therefore, derive any conclusion for policy purposes but we must point out the need for research into the possibility of replacing a significant proportion of rice with wheat in the diets in East Pakistan.

III. ANALYSIS OF FOOD CONSUMPTION IN URBAN AND RURAL AREAS

a) Urban-Rural Diet Differentials

The consumption of selected food items in urban and rural areas is shown in Table VI. The important points revealed from the table are: *i*) a rural resident consumes more food than his urban counterpart, the greatest gap in urban-rural food intake being in West Pakistan; *ii*) per capita consumption

of wheat is higher in urban than in rural areas of East Pakistan while the consumption of rice is lower in urban than in rural areas of West Pakistan; *iii*) per capita consumption of milk is highest in rural West Pakistan; *iv*) except for milk consumption in West Pakistan, the consumption of food items with expected high income elasticities is higher in urban than in rural areas; and *v*) urban consumption is more diversified than rural consumption, *i.e.*, urban consumers eat more of better-quality food (protective foods) than rural consumers.

TABLE VI

MONTHLY PER CAPITA CONSUMPTION OF MAJOR FOOD ITEMS IN URBAN AND RURAL AREAS OF PAKISTAN
(1963/64)

(in seers)

Food items	East Pakistan		West Pakistan	
	Rural	Urban	Rural	Urban
Rice and wheat	14.7	13.91	16.07	12.65
Wheat	0.94	1.97	14.61	11.30
Rice	13.85	11.94	1.46	1.35
Sugars	0.29	0.37	0.67	0.98
Pulses	0.42	0.72	0.74	0.76
Potatoes	0.22	0.29	0.22	0.54
Meats	0.30	0.45	0.41	0.73
Fish	1.01	1.01	—	0.16
Milk	0.96	1.27	4.16	3.31
Fats and oils	0.21	0.31	0.36	0.53
Tea (*in pounds*)	0.01	0.08	0.06	0.11
Total:	19.13	18.44	22.69	19.77

Source: [13, Pp. 34-35, 48-49, 90-91, 104-105, 118-119].

b) Factors Affecting Urban-Rural Diet Differentials

The urban-rural diet differentials can be explained in terms of the urban-rural differentials in income, prices and availability of a particular food item. The price differentials and the necessity of non-food expenditure affect the urban population of East Pakistan much more than the urban population of West Pakistan largely because the urban per capita income is much lower in East Pakistan than in West Pakistan while there may not be much income differentials in the rural areas of the two wings[7]. To examine the hardship of the urban people in East Pakistan, we present the calorie value of food consumed in urban and rural East Pakistan in Table VII.

TABLE VII

PER CAPITA PER DAY CALORIE INTAKE IN URBAN AND RURAL EAST PAKISTAN

(March 1962 — January 1964)

Food items	Rural		Urban	
	Calories	Per cent	Calories	Per cent
Cereals	1,904	84.6	1,280	73.9
Starchy roots	34	1.5	21	1.2
Sugars and sweets	18	0.5	42	2.4
Pulses and nuts	108	4.8	90	5.2
Vegetables	41	1.8	33	1.9
Fruits	3	0.2	9	0.5
Meats	9	0.4	28	1.6
Eggs	3	0.0	3	0.2
Fish	45	2.0	62	3.6
Milk	16	0.7	35	2.0
Fats and oils	52	2.3	121	7.9
Miscellaneous	14	0.6	10	0.6
Starchy-staples[a]	1,904	84.1	1,301	75.1
Protective foods[b]	225	10.0	260	15.0
All foods	2,251	100.0	1,732	100.0

[a]Cereals plus starchy roots. *Source:* [14, Pp. 78, 111 and 219].
[b]Pulses, nuts, vegetables, fruits, meats, eggs, fish and milk.

[7]East Pakistan still remains an agricultural economy whereas West Pakistan is more diversified. As a result, urban per capita income is considerably higher in West Pakistan than in East Pakistan [14, pp. 105-106].

The urban population in East Pakistan is under considerable pressure to reduce food intake to fulfil other wants of urban life. The real victim of the high price of rice is the urban population. Since an urban person does not produce rice but has the same preference for rice as his rural counterpart and since urban house rents are high because of scarcity of urban land, the urban population is undernourished in relation to the rural population even though per capita income is higher in urban areas than in rural areas. The high price of rice and the availability of wheat at half the price of rice accounts for the significant wheat consumption in urban East Pakistan[8]. And, since rice is self-produced by most of the rural population, the pressure to consume wheat is relatively low in rural than in urban areas of East Pakistan. Hence, per capita consumption of wheat is higher in urban than in rural East Pakistan.

Rice is an inferior grain compared to wheat in West Pakistan. Since per capita income is lower in rural than in urban areas, the per capita consumption of rice is lower in rural than in urban West Pakistan.

Milk consumption is highest in rural West Pakistan because of the tradition of raising milk cattle in the rural areas foı the supply of milk as well as draught animal. Lack of proper transport and refrigeration facilities prevent the supply of milk and milk products going to the urban areas of West Pakistan in large quantities even though the income and hence the demand for milk and milk products is higher in urban than in rural West Pakistan.

IV. CONCLUSIONS

The aggregative analysis of food consumption in Pakistan shows considerable undernutrition and malnutrition in a broad section of the population, specially in the eastern wing. The high starchy-staple ratio is a common feature of the diets in all regions of Pakistan and is a manifestation of the poverty in Pakistan. The undernutrition and malnutrition are, therefore, the results of low per capita income.

The pattern of food consumption in East Pakistan seems to be quite different from that in West Pakistan. Food consumption in East Pakistan is governed by the preference for rice and the low per capita income. In West Pakistan, wheat is a preferred cereal but not a preferred food; the population in West Pakistan has a tendency to shift to animal products for the major part of the calories if the income is permissive of such a shift. The pattern of food consumption in West Pakistan may, therefore, be said to be governed by the level of per capita income.

[8]Per capita per day wheat consumption in urban East Pakistan was 46.6 grams in comparison to only 18.4 grams in rural East Pakistan during the period from March 1962 to January 1964 [6, Pp. 211 and 214].

In both East and West Pakistan, food-growing activities are given priority by the farm households because of lack of confidence on the market to supply food at a price which would make it profitable to produce non-food crops and exchange with food crops. And, since the cost of production of cereals (rice in East and wheat in West Pakistan) is presumably the lowest per calorie produced, the farmers devote more land to the production of cereals in comparison to other food crops. As a result, cereals predominate the diets in both wings of Pakistan. The preference for rice as well as the relatively low per capita income in East Pakistan in comparison to West Pakistan makes rice more preponderant in the diet in East Pakistan than wheat is in West Pakistani's diet.

Meat consumption is low in both wings because of the tradition of raising cattle for the supply of milk and power, the poverty and smallness of Pakistani villages which cannot probably consume a big animal in one day, and the population pressure on land, specially in East Pakistan.

The preference for rice and the resulting high price of rice in East Pakistan are responsible, to a large extent, for the severe undernutrition and malnutrition in East Pakistan, specially the urban East Pakistan. The increase in per capita wheat consumption in East Pakistan can improve the quality of diet by releasing income spent on rice and thus enabling the population to consume more of the nutritious foods. Although it is shown elsewhere that there is an asymptotic level of wheat consumption in East Pakistan with respect to income as well as the price of rice within the range of variations in income and price of rice observed [7, Pp. 164-165], there is evidence that per capita wheat consumption in East Pakistan is likely to rise as a result of urbanization and change of preference in favour of wheat. Such a shift will be helpful for the utilization of surplus wheat of West Pakistan which is likely to be available as a result of agricultural revolution in West Pakistan.

We pointed out the underestimation of wheat production in West Pakistan and the possible overestimation of rice production in East Pakistan. The extent of underestimation and/or overestimation in grain production is quite big and has a serious repercussion on the extent of income disparity existing in the two wings of Pakistan. We hope that our findings will provoke researchers to pay attention to this aspect of the problem in finding the true disparity existing between the income levels in the two wings of Pakistan so that planning for reduction of income disparities between East and West Pakistan is based on accurate knowledge of the problem.

REFERENCES

1. Andrus, J. R. and A. F. Mohammad, *The Economy of Pakistan.* (Stanford: Stanford University Press, 1958).

2. Bennett, M. K., *The World's Food.* (New York: Harper and Brothers, 1954).

3. F. A. O., "Factors Influencing the Trend of Food Consumption", in F. A. O., *The State of Food and Agriculture, 1957.* (Rome: Food and Agriculture Organization, 1957).

4. ————, *Food Balance Sheets 1960-62 Average.* (Rome: Food and Agriculture Organization, 1966).

5. Haq, Mahbubul, *The Strategy of Economic Planning: A Case Study of Pakistan.* (Karachi: Oxford University Press, 1963).

6. Hufbauer, G. C., "Cereal Consumption, Production and Prices in West Pakistan", *Pakistan Development Review*, Vol. VIII, No. 2, Summer 1968.

7. Khan, M. Irshad, *Economics of Food Consumption in Developing Countries: A Case Study of Pakistan.* Unpublished Ph.D. dissertation submitted to the Department of Economics, Stanford University (U.S.A.), 1969.

8. Nazeer, M. M., "The Food and Food Habits of Pakistan", *Economica Internationale*, Vol. XVII, No. 4, November 1964.

9. ————, *The Rice Economy of Pakistan.* (Amsterdam: Drukkeriys Systema N.V.).

10. Pakistan, C. S. O., *National Sample Survey (Second Round), 1960.* (Karachi: C. S. O., 1962).

11. ————, ————, *National Sample Survey (Third Round), 1961.* (Karachi: C. S. O., 1963).

12. ————, ————, *Pakistan Statistical Yearbook 1964.* (Karachi: C. S. O., 1965).

13. ————, ————, *Report on the Quarterly Survey of Current Economic Conditions in Pakistan, Household Income and Expenditure, July 1963— June 1964.* (Karachi: C.S.O., 1967).

14. Pakistan, Ministry of Health, *Pakistan Nutrition Survey of East Pakistan March 1962— January 1964.* (Bethesda, M. D.: United States Department of Health and Welfare; Public Health Service; National Institute of Health; Office of International Research, Nutrition Section, 1966).

15. Pakistan, Ministry of Home Affairs, *Population Census of Pakistan, 1961, Census Bulletin No. 2.* (Islamabad: Office of the Census Commissioner, Ministry of Home Affairs, 1961).

16. Qureshi, A. I., *Pakistan Economic Survey, 1966-67.* (Rawalpindi: Ministry of Finance, 1967).

17. Rashid, H., *East Pakistan, A Systematic Regional Geography and Its Development Planning Aspects.* (Lahore: Sh. Ghulam Ali and Sons, 1965).

18. Sen, A. K., *Choice of Techniques.* (Oxford: Basil Blackwell, 1962).

19. Sherman, H.C. and C. S., Lanford, *Essentials of Nutrition.* (New York: The MacMillan Company, 1943).

20. USDA, *The World Food Budget 1970.* Foreign Agricultural Economic Report No. 19. (Washington D.C.: United States Department of Agriculture, Economic Research Service, Foreign Regional Analysis Division, October 1964).

21. Wilber, D. N., *Pakistan, its People, its Society, its Culture.* (New Haven: Hraf Press, 1964).