The Growing Grain Deficit and its Implications

for China's Development Strategy
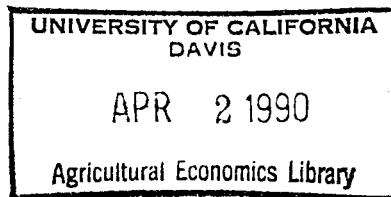
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In the late 1980s the issue of grain once again became a topic for debate within China's policy circles. Prior to that the sharp acceleration in grain production between 1978 and 1984 had led some to conclude that China had solved its grain problem at least for the time being. Grain output peaked, however, in 1984 at 407 million tons and stayed below that level throughout the next four years. From being a net exporter of grain in 1985 and 1986, China in 1987 and 1988 returned to its more normal posture of being a net importer of cereals.

The grain question, however, cannot be studied in isolation. It is part of a much broader and more important range of issues and can only be understood in that broader context. Grain, for example, is only one component of farmer income and a declining component at that. Rational farmers responding to market signals in the 1980s spent more and more of their time and resources on cash crops and subsidiary activities instead of grain. From the point of view of these farmers there was no grain problem, only an opportunity to raise their standard of living by cultivating cotton and vegetables or by working in a local construction enterprise.

But the grain issue is also vested in the underlying question of what is the appropriate overall development strategy for China. In that context it is useful to begin by pointing out that there are few substitutes for grain in the human diet.

Meat, to be sure, is a major source of calories in richer countries, but meat in most such countries is a kind of processed grain. Cattle and hogs are fattened on feed grains in most of the world. Fish are less frequently fed grain, but China does not have a large enough fishing industry for aquatic products to become a major substitute for grain. Thus, China must somehow find a way to supply its consumers with grain. The source can be domestic production or imports of cereals produced abroad, but one option that is not open is to ignore the grain supply altogether. In the analysis that follows, the first step will be to try to understand the forces at work in determining the demand for and supply of grain in China over the decade of the 1980s and in the decades that preceded the 1980s. With the past performance as background, the next step will be to speculate about what is likely to happen to grain demand and supply over the next decade or two. The final step is to relate those projections into the future to the broader question of what choices China has in its overall development strategy in the coming years. To telegraph the primary conclusion of this essay, China basically does not have many viable choices when it comes to a long term development strategy. If China wants to grow rapidly, imports will have to also grow rapidly, and one of the important components of that rising import bill will be grain. To pay for that grain and other essential imports, Chinese exports will have to increase rapidly too.

## Grain Demand and Supply in the 1980s

There is a simple equation that captures some of the critical elements determining the demand for grain.

$$\dot{D} = \dot{p} + \eta y \, \dot{y}$$

Where,

$\dot{D}$ = the rate of increase in demand for grain,

$\dot{p}$ = the rate of increase in population,

$\eta y$ = the income elasticity of demand for grain,

$\dot{y}$ = the rate of increase in income per capita

The demand for grain as used here refers both to grain consumed directly and grain fed to animals and poultry and consumed indirectly.

Those who talk about the grain problem in China often concentrate on $\dot{p}$, the rate of population growth. But China's population growth in the 1980s at one point fell to 1.2 percent a year before rising to 1.5 percent toward the end of the decade. Even if China's population were to return to the 2 percent rate of much of the 1960s and 1970s, a not very likely prospect, the increase in demand for grain each year would be less than one percent a year above what would have occurred if the 1.2 percent rate had been maintained.

The bigger problem of rapid increases in demand for grain during the 1980s was caused, not by accelerating population growth, but by increases in per capita demand brought about by rising personal incomes. Between the end of 1978 and 1988 Chinese gross national product rose in real terms at an average

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rate of 9.6 percent per year. Because population grew at an average rate of 1.3 percent a year over the same period, per capita GNP rose at 8.3 percent a year.

Per capita GNP is not the same thing as personal income and we do not have direct estimates for personal income for China. We do know, however, that the share of consumption in net material product was slightly higher in 1987 (65.3 percent) than in 1978 (63.5 percent) and that personal savings rose sharply over this period. Taken together these trends suggest that personal income was growing at least as quickly as per capita GNP or at over 8 percent a year. If the GNP figure itself is distorted by unrealistic prices or unreliable statistical reporting systems in particular sectors, then true GNP per capita may be a bit below the officially estimated figure in which case the growth of personal income per person per year would also be lower. It may be better to talk about a possible range for personal income growth of 7 to 8.5 percent a year than a single precise figure.

What remains is to come up with some kind of estimate for the income elasticity of demand for grain in China. In the paper by Peng Tso-Kwei elsewhere in this volume the income elasticity of demand for grain in Taiwan in the 1962-66 period was 0.5.[1] Taiwan's per capita GNP in 1985 U.S. dollars at that time was about $650. According to the World Bank Atlas, China in 1987 had a per capita GNP of only $300, but this figure reflects the peculiar features of China's official exchange rate and cannot be

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compared usefully with the Taiwan figure.[2]  In my opinion, a figure for China roughly comparable to that for Taiwan would be in the $500 range.  Perhaps then an income elasticity of demand for China would be similar to that of Taiwan in this earlier period.  International experience outside of East Asia, however, would suggest a somewhat higher figure, conceivably as high as 0.7 or 0.8.

The reader can make his or her own assumptions about which of these estimates us the correct one.  Here we shall present a range.

$$\text{high/estimate} \quad \dot{D} = .013 + .7 \times .083 = .071$$
$$\text{low estimate} \quad \dot{D} = .013 + .5 \times .07 = .048$$

During the reform period 1978 -1988, if these figures are correct, the demand for grain in China was growing at a rate of 5 to 7 percent a year.

The supply side of the story is straightforward.  Between 1978 and 1984, grain output in China (including potatoes and soybeans) grew at an average annual rate of 5 percent, but grain output peaked in 1984 at 407 million tons (see Table 1).  Over the entire 1979 - 1988 decade the rate of increase in grain output averaged 2.6 percent per year.

Over the reform decade as a whole, therefore, there was a gap of more than 2 percent per year between the growth rates of demand and supply.  In the first six years of the decade, however, there was no gap at all and that is when China switched over from being a net importer to a net exporter (see Table 2).

## Table 1

### Grain Ouput in China

| Year | Amount (million tons) (includes soybeans and potatoes*) |
|------|------|
| 1952 | 163.92 |
| 1957 | 195.05 |
| 1962 | 160.00 |
| 1965 | 194.53 |
| 1970 | 239.96 |
| 1975 | 284.52 |
| 1978 | 304.77 |
| 1980 | 320.56 |
| 1984 | 407.31 |
| 1988 | 394.00 |

*Potatoes were converted to grain equivalents at the rate of 4 kg. of potatoes to 1 kg. of grain before 1963 and 5kg. to 1 kg. of grain thereafter.

Sources: State Statistical Bureau, Zhongguo tongji nianjian, 1988, p. 248; and "The Chinese Economy in 1988," Beijing Review vol. 32, No. 6, February 6-12, 1989, p. 23.

Table 2

Grain Imports and Exports
(million tons)

| Year | Exports | Imports | Net Imports (minus represents net exports) |
|------|---------|---------|--------------------------------------------|
| 1952 | 1.53 | 0 | -1.53 |
| 1957 | 2.09 | .17 | -1.93 |
| 1962 | 1.03 | 4.92 | 3.89 |
| 1965 | 2.42 | 6.41 | 3.99 |
| 1970 | 2.12 | 5.36 | 3.24 |
| 1975 | 2.81 | 3.74 | 0.93 |
| 1978 | 1.88 | 8.83 | 6.96 |
| 1980 | 1.62 | 13.43 | 11.81 |
| 1981 | .99 | 13.83 | 12.84 |
| 1982 | .81 | 16.15 | 15.34 |
| 1983 | 1.15 | 13.53 | 12.41 |
| 1984 | 3.19 | 10.41 | 7.22 |
| 1985 | 9.33 | 5.97 | -3.36 |
| 1986 | 9.42 | 7.73 | -1.69 |
| 1987 | 7.37 | 16.28 | 8.91 |
| 1988 | 7.18 | 15.33 | 8.15 |

Sources: State Statistical Bureau, Statistical Yearbook of China, 1981, pp.372 and 388; State Statistical Bureau, Statistical Yearbook of China, 1982,1984,1986,1988 (various issues, various pages); and General Administration of Customs, China's Customs Statistics, 1989, Vol. 1, pp.21 and 30.

In the final four years of the decade, in contrast, the demand-supply gap was more than 5 percent per year or conceivably as much as 80 million tons of grain by early 1989.

How was this gap in the latter part of the period filled? To begin with China switched from being a net exporter of 3 million tons of grain in 1985 to a net importer of over 8 million tons in 1987 and 1988 thus closing 11 million tons of the gap. We do not have data, however, that explains how the large remaining portion of the gap was covered. Presumably there was a run down in grain stores that had been built up in the early 1980s but precise figures are not available. There was also pressure on grain prices. In 1986 and 1987 the free market price of grain sold rose by 42.4 percent while the overall free market price index rose only 24.7 percent. The official price of grain was also raised but despite that the free market prices in 1987 were 93 percent higher than the state's retail prices. It may be that there was also some informal rationing of grain. In a matter of only 3 or 4 years, China went from a country worried about where to store all of its surplus grain to a nation that was struggling to fill a large and rising gap between demand and supply.

Why was there such a rapid change from a surplus to a deficit in the 1980s rather than in the years prior to reform? The answer is readily supplied when one looks at the supply and demand equation for these earlier years.

$$\dot{D} = .02 + .7 \times .023 = .036$$

In the 1960s and 1970s GNP averaged 4.5 percent growth per year and the rate of state investment rose steadily, while the share of consumption fell. Thus, the personal income growth rate was below that of GNP per capita. Incomes were lower then so the income elasticity of demand was probably higher. The population growth rate was also higher than in the 1980s, averaging about 2 percent per year.

Grain output in at least some of these pre-reform years almost kept up with demand. Between 1965 and 1978, for example, grain output averaged an annual increase of 3.5 percent. For the entire two decades preceding reform, however, the average growth rate was only 2 percent.

The story of what happened to the demand-supply gap in these pre-reform decades is well known. In the crisis years, 1959-1961, grain output fell sharply and rations per capita, already tight, were cut to the bone in an effort to even out the deprivation. The effort was not entirely successful, to put it mildly, and tens of millions of people died from causes in large part related to malnutrition. By 1965 grain output had recovered to 1957 levels in absolute but not per capita terms. In the years that followed up to 1978 domestic supplies per capita rose in most years but so did demand. As China's foreign exchange situation improved, the demand-supply gap was filled in part by rising imports. By 1978 China was a net importer of 7 million tons of grain (see Table 2), but rationing of grain sales to consumers was still in force.

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The absence of a severe supply-demand gap for grain before the reform period reflected in part, therefore, the fact that per capita grain output and per capita supplies were rising slowly but steadily. Of equal or greater importance, however, was the fact that personal incomes were also growing slowly. If personal incomes had risen in these early years as fast as they did in the 1980s, China would have faced a severe grain shortage much earlier.

The shortage that China did face in the late 1980s and could have faced in the early 1970s if incomes had grown faster, however, was fundamentally different in character from the shortages of the 1959-1961 period. In the latter case, the gap between supply and demand was created by a drop in supply that drove parts of China's population below a subsistence level. In the late 1980s the gap was created more by the accelerated increase in demand. In 1987, per capita grain production was 359 kilograms. In 1965, by way of contrast, per capita production was 268 kilograms and in 1962 it was 238 kilograms. At the bottom of the 1959-1961 crisis years per capita production was even lower. The shortages of the late 1980s were a result of prosperity. The shortages of the early 1960s were the result of extreme poverty. The two situations could not be more different and the solutions called for should also be different. We shall return to the issue of solutions below.

Before concluding this section, however, it is important to reemphasize that the data on which these demand calculations are

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based is flawed. The elasticity estimates in particular are little more than informed guesses. Clearly there is a need for more carefully constructed estimates of the income elasticity of demand for the consumption of grain and meat and the use of those elasticities, to come up with and overall elasticity that can be used in the basic equation presented here.

### Future Demand and Supply

The components of any forecast of the future of China's grain market are the same as those used to analyze trends in the past. The demand side involves forecasts of three elements, the rate of population growth, the future rate of increase in personal income or per capita GNP, and the trend in the income elasticity of demand for grain. These forecasts are speculative but most of the plausible guesses about these trends point to a rising gap between the demand for and supply of grain.

Forecasting the future rate of population growth presents the fewest difficulties, because there is probably only a one percent difference between the extremes of what is likely to occur. At the low end, China could continue for a decade and longer to pursue a one child per family policy that would be effective in urban areas but less effective among farmers. Conceivably such a policy could drive the population growth rate down to one percent per year (a crude fertility rate of perhaps 17/1000 and a mortality rate of 7/1000). There is very little prospect any time soon that China can lower fertility more than

this despite the government's desire to achieve zero population growth two or three decades into the next century. At the upper end it is conceivable that China's population could rise to the long term levels achieved in the 1960s and 1970s of 2 percent a year, which would imply a fertility rate of about 27/1000. Higher rates than that would imply fundamental changes in Chinese behavior back toward a preference for very large families, and that doesn't seem likely.

China's future GNP growth rate is more difficult to forecast. All one can do is establish a plausible range. The rate of growth of the past decade of a little over 9 percent a year is the upper end of that range. In fact, the recent slowdown in agricultural output growth, the problem of controlling inflation, and the long term impact of the political turmoil of May-June 1989 all suggest that achieving a future GNP growth rate of 9 percent per year will be extremely difficult. In fact, a rate of 8 percent a year may be a better guess as to the upper end of what is possible.

In establishing the lower end of this range, it is useful to keep in mind that China is likely to maintain a high rate of gross capital formation of around 30 percent of Gross National Product. Furthermore, there is every reason to believe that China will continue the policy of openness to foreign trade and will not revert back to the autarkic policies of the 1960s and early 1970s. Thus productivity growth should be higher than in those earlier years. Political instability over the next decade

could be a negative influence, but it is unlikely that China will experience instability of the magnitude of what occurred during the Cultural Revolution. Nor are there likely to be policy errors of the magnitude of what occurred during the Great Leap Forward in 1958-1960. Overall, therefore, unless there are long-term underlying weaknesses in the Chinese economy that are not now apparent, China's economy should do at least as well as it did during the 1957-1976 period when gross national product grew at a rate of around 4.5 percent per year.

A forecast of the income elasticity of demand for grain in China in the 1990s can be based on international experience. In the calculations below we shall use Taiwan's elasticity rate for the early 1960s of 0.5 . The current mainland Chinese elasticity, as indicated above, is probably higher, and, if Chinese per capita income grows rapidly over the next decade or two, the future income elasticity of demand could fall below 0.5.

If these forecasts of the three components of the demand equation are roughly correct, they lead to the following estimates for the future growth rate in demand for grain. These estimates are presented as a range -- a low and high estimate and one example of what might occur in the middle of the range.

$$\text{low estimate: } \dot{D} = .01 + 0.5 \times .04 = .030$$

$$\text{mid-range estimate: } \dot{D} = .015 + 0.5 \times .06 = .045$$

$$\text{high estimate } \dot{D} = .02 + 0.5 \times .07 = .055$$

The low estimate could represent what might happen if China reverted back to an inefficient controlled economy with vigorous

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enforcement of the one child per family policy. The high
estimate might be achievable if China abandoned most controls and
was willing to live with a high rate of inflation.

These estimates are clearly sensitive to the figure used for
the income elasticity of demand for grain. If we had used 0.7
instead of 0.5, for example, the range of growth rates in demand
for grain would rise to between .038 to .069. This underlines
the point made above that more reliable estimates of these
elasticities are needed.


## The Supply Side

Is it conceivable that supplies of grain can keep up with
these rates of increase in demand? There are several kinds of
evidence that have some bearing on this question. There are the
historical rates of growth in Chinese grain output achieved in
the past, there is the experience of China's East Asian neighbors
who have a land endowment and agricultural technology somewhat
similar to that of the Chinese mainland, and there is information
on the likely future growth of key inputs into grain output in
China.

Between 1957 and 1989 Chinese grain output averaged a rate
of increase of 2.2 percent per year, but there have been periods
when China has done better than that. One such period, as
already mentioned, was the first six years of reform, 1979-1984,
when grain grew at an annual average rate of 5 percent. But a 5
percent rate is clearly unrealistic for the long term. That rate

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was the product of one shot gains from the rural reforms plus a dose of good weather in 1984. Of greater relevance is the 3.5 percent rate per year achieved between 1965 and 1978. By 1965 Chinese grain output had recovered from the devastation of 1959-1961, and 1978 was the last year before the introduction of rural reforms, although weather was not very good in that year. Growth in the 1965-1978 period, was achieved mainly by increases in inputs of fertilizer combined with the introduction of new plant varieties and some expansion of the irrigated acreage. Since 1978, however, the average rate of increase in grain output through 1988 was only 2.6 percent.

A brief survey of the recent experience with grain production of Japan, South Korea, and the Province of Taiwan suggests that sustained increases of over 3 percent a year may be difficult to achieve. In Japan, despite prices for rice that are several times world levels, cereal production in the latter half of the 1980s was no higher than it was in 1976, a zero percent growth rate for a decade and more. In South Korea as well, cereal production in the late 1980s was about the same as or a little below the level of the mid-1970s. Rice production in Taiwan actually fell after 1976 and the growth rate of other cereal crops was even more sharply negative. Per capita incomes in Japan, South Korea, and Taiwan, however, are much higher than on the Chinese mainland and these societies are highly industrialized and urbanized. There are factors working to slow grain output growth operating on both the demand and supply side

that might not be applicable to China. The small size of the rural labor force is one case in point.

If one analyzes the input side of the Chinese agricultural output equation, however, there are not many grounds for optimism.[3] There is no better place to start then with the question of arable land. In 1957,China's State Statistical Bureau estimated that the country had 112 million hectares of arable land.[4] By 1987 that estimate had fallen to 96 million hectares despite two decades up to the mid-1970s when massive amounts of labor were mobilized in part to open up new arable land.[5] These estimates of arable land may not be very reliable because some new land development has gone unreported. But there is little doubt that the overall trend is negative, thanks largely to pressures form urbanization and industrialization. The pressures to convert land to nonagricultural uses can only get stronger in the decade to come.

Is it possible for China to expand the area under irrigation so that the country could expand multiple cropping and achieve higher grain yields per hectare? An increase in irrigated acreage from 33 million hectares to 45 million hectares between 1965 and 1978 was part of the reason for the relatively high grain output growth rate of that period. But there has been no increase in the irrigated acreage since 1978 and the reasons are straightforward. Most of the rise between 1965 and 1978 was achieved by digging tubewells on the North China Plain, and the potential for that kind of expansion was exhausted before 1978.

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Efforts to bring irrigated water to the remaining 50 million
hectares of Chinese farmland are likely to prove to be extremely
expensive or infeasible altogether. Rainfall over most of this
acreage averages only 500 to 700 mm a year. The Yellow River,
the largest river in the non-irrigated parts of China, is one of
the most silt laden rivers in the world, comparable to the
Colorado in the U.S. Removing the silt from this river by
grassland development and by building dams on its tributaries and
upper reaches will be extremely expensive. And the rate of flow
or discharge of the Yellow River is not very large to begin with,
only 6 percent of the rate of discharge of the Yangtze river.
There has been talk of schemes to move Yangtze River water to
the north to make up for this lack, but those schemes would also
be enormously expensive.

In summary, most of the arable land of China that is going
to be irrigated is already being irrigated. In fact, half of the
land currently irrigated was probably under some form of
irrigation by the middle of the Qing dynasty.[6] An important part
of the rise in grain output both prior to 1978 and in the 1980s
was the increased availability of chemical fertilizer. In 1987
China was using 20 million tons of chemical fertilizer (measured
in terms of nutrient) or a little over 200 kilograms per arable
hectare (about 140 kilograms per sown hectare). By way of
comparison Taiwan rice used around 250 kilograms of nutrient per
hectare and the highly subsidized Japanese rice farmers use over
400 kilograms per hectare. But Chinese farmers still use

substantial amounts of organic fertilizer as well. Clearly there
is not a lot of room for major further increases in grain output
simply by applying more chemical nutrient to the soil.

In terms of technological solutions, therefore, future
growth in grain output depends on the research and development of
higher yielding varieties of grain and their rapid distribution
to Chinese farmers. I am completely unqualified to judge what
this research potential may be. Presumably, recent political
events won't make research breakthroughs of the required
magnitude any easier if researchers trained abroad don't return
to China to work on these problems. Even if the atmosphere in
China does change enough so that these researchers do return and
those in China are free to spend their time on research, the task
ahead is a formidable one.

To what degree could improved incentives make it possible to
use inputs more efficiently and achieve higher yields and output?
There is some potential for institutional change that would
enhance incentives. D. Gale Johnson, elsewhere in this volume,
writes about the instability of land tenure as the result of the
lack of well defined property rights.[7] Clearer property rights
would give farmers a greater incentive to maintain existing
irrigation systems, something many have been apparently unwilling
to do in recent years. But the big increases in incentives
through institutional reform have already been achieved. The
return to household based farming restored the clear connection
between effort and reward that had been attenuated by the work

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point system of the communes and production teams. For the future there is more of a danger that this connection between work and reward will be eroded than there is a prospect that it will be improved.

Could higher grain prices make a substantial contribution to the attainment of higher grain output? To do so these higher prices would presumably have to lead to a shift in resources away from other crops toward grain. The data on sown acreage in grain gives one some idea of what is possible. In 1987, 77 percent of the sown acreage in China was in grain. The highest percentage of acreage in grain, 87 percent of the total, was achieved in 1952 and 1962. These latter years were ones in which Chinese farmers were struggling for survival and did everything in their power to ensure that their families received at least minimum requirements for nutrition. The 87 percent figure can thus be treated as an upper limit on how much land could be shifted back into grain by higher grain prices. Given that Chinese farmers are not now anywhere near the subsistence level for the most part, a realistic shift of land back into grain would be much smaller.

It would take an extraordinarily high grain price to achieve an increase in grain output of 10 percent by that means. The current official average grain purchase price of $135 per ton is roughly at world prices so there is little potential for increase without following the Japanese example of keeping prices well above the world level.[8] China is already selling grain at or

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below cost depending on which market it is sold on so that
further increases in the purchase price would either have to come
out of the government budget or the budget of individual
consumers.  The government was already strained in the early
1980s by the cost of agricultural subsidies and is not likely to
want to go a long way toward even larger subsidies.[9]  Higher
grain prices to consumers risk further alienation of an urban
population that is not happy with the government as it is.  In
short, there is not a lot of potential for expanding grain output
by paying farmers higher prices for their output.

Could the government accomplish by force through compulsory
quotas what it might be unwilling to do with higher purchase
prices?  In effect this would be a reversion to policies of an
earlier era when slogans such as "take grain as the key link"
were popular with the leadership.  It is an open question whether
China's government today has either the will or the power to
reestablish grain quotas for China's farm households.  But even
if the government does have the will and the power to do so, what
would be gained?  The government might be able to force a shift
of acreage to grain from 77 percent up to say 82 or 83 percent of
the total.  Forcing a shift in other inputs such as chemical
fertilizer would be more difficult to achieve because it would be
almost impossible to monitor.  Thus the use of compulsory grain
quotas might raise grain output by 5 percent.  But that assumes
that farmer incentives to work efficiently on grain would not be
much affected and that is highly unlikely.  If farmers shift land

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into grain but turn all of their efforts to other crops not so tightly controlled, a prospect that is virtually a certainty, then grain output might actually fall despite the increase in sown acreage.

In summary, there are no easy methods for raising the rate of growth in Chinese grain output. Research into new higher yielding plant varieties is central to whatever success is to be achieved. Higher prices for grain and more secure property rights will help. Further increases in the use of chemical fertilizer, better machinery for pumping water, and increases in other inputs will play a positive role, even if subject to diminishing returns. What will all of these measures imply for the growth rate of grain output? It doesn't seem likely that China can match the 3.5 percent rate of the 1965-1978 period. A decline to a growth rate of one percent a year would have grave implications for a rapidly developing economy so one assumes a major effort will be made to do better than that. Thus one is left with a likely agricultural growth rate, of 2 to 3 percent a year. If grain output growth is not in this range, it is more likely to be below 2 percent than much above 3 percent for any period as long as a decade.

## The Widening Gap

If these projections of the demand for and supply of grain are roughly accurate, then the implications are quite clear. If China can keep grain production increasing at 3 percent a year,

then China can keep this demand supplied from domestic sources if
the overall growth rate in personal incomes is held to 4 percent
per capita per year and the population growth rate is reduced to
1 percent per year. Any rate of growth of personal incomes above
this level, with or without a higher population growth rate, will
lead to a widening gap between grain demand and supply.

How large could this gap become? If we take our mid-range
estimate of the growth in demand of 4.5 percent per year and a
supply growth rate of 3 percent, the difference is 1.5 percent a
year or a gap that widens by 6 million tons of grain each year.
Over a decade the gap would exceed 60 million tons each year.
The next question then is how will this gap be filled?

If the Chinese government is determined to close this grain
deficit relying only on domestic sources of grain, there is only
one way over the long run that this can be done. The GNP and
personal income growth rate will have to be held to levels little
or no higher than what was achieved in the pre-reform period, and
large investments will have to be made in agriculture and
agricultural research. Over the short run of several years the
government can also close the gap by reimposing an increasingly
rigorous system of food rationing, but rationing will have
several disincentive effects if it alone is used to close the
gap.

The other solution, of course, is to use imports of grain to
make up the deficit without a resort to rationing. These imports
will have to rise steadily year by year and will make the 1988

net imports of 8 million tons seem small indeed. How large these imports will have to be depend on too many assumptions to be precise. If incomes per capita grow at 5 or 6 percent a year and production only at 2 percent, then imports could be as high as 80 to 100 million tons by the year 2000. If demand growth is lower, if production increases faster, and if there is some increase in rationing and restrictions or price incentives to discourage converting grain into beef and pork, then it may be possible to hold net imports by the year 2000 to 30-40 million tons and still enjoy a fairly high growth rate.

Could China afford to import 40 million tons of grain each year or twice that amount? At $130 a ton price the cost in foreign exchange would be $5 billion to $10 billion in foreign exchange each year.[10] But then prices are not likely to stay at current levels if China increases its purchases by figures of this magnitude, so the foreign exchange requirements for even 40 million tons may approach $7 to $10 billion depending on what happens to demand and supply in the rest of the world.

.These are large figures but so are the figures for China's total exports and foreign exchange earnings. In 1975 China's total exports were only $7.26 billion and they were at $9.75 billion in 1978. After ten years of reform, in contrast, Chinese exports in 1988 reached $47.6 billion. In addition China was receiving another $8 billion in credits and direct investment. In this context China's actual cereal imports (net) of $706 million are barely worth notice. They certainly were not a

significant cause of shortages of priority imports for other sectors.

Even at today's export levels, China could afford to import (net) 30 to 40 million tons of grain if prices stayed down. Other sectors would have to cut back, but China would still have nearly $50 billion in foreign exchange each year to meet the needs of these other sectors. If exports grow at 9 percent a year, a figure that is well below the 17 percent per annum rate of the previous post-reform decade just ended, then export earnings ten years from now will be over $100 billion and an amount ten times what is currently spent on grain should be feasible without sacrificing much growth in the economy as a whole. In short, as long as China maintains a successful outward looking policy in the trade sphere, increasing imports of grain should not pose a serious problem. If export growth were to slow markedly or stop altogether, however, China would probably have to markedly slow its overall growth rate in order to be able to avoid more imports of grain than the country could afford.

In many respects China over the past decade has been following a development strategy with many features in common with the strategies of its East Asian neighbors. Two of the essential features of this strategy were a high rate of growth in the export of manufactures and a rapid increase in imports of food. But China cannot afford to go as far in terms of dependence on grain imports as its East Asian neighbors. Taiwan, for example, imported $880 million worth of wheat, corn, and

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soybeans, or $45 per capita.  If the Chinese mainland were to import the same dollar amount per capita, the total value of grain and soybean imports would come to $45 billion, a figure China cannot afford now or anytime in the foreseeable future. South Korea's total food imports, including live animals, amounted to $54 per capita.[11]

Thus a rapid growth strategy for China implies an outward looking trade strategy because, among other reasons, that is how China will be able to afford the rising grain imports that will be needed to sustain the strategy.  But China must also maintain a significant rate of growth not only in the value of agricultural output in general, but in grain in particular.  To achieve that goal China will have to invest heavily in agriculture in the years to come, much more heavily than has been the case in the 1980s.

ENDNOTES

1.  Peng Tso-Kwei, "Prices Income and Farm Policy in Taiwan," p.36

2. The World Bank, _The World Bank Atlas, 1988_ (Washington: The World Bank, 1988) p.6.  Chinas's official exchange rate is overvalued in the sense that demand for imports at that rate greatly exceeds what China is able to supply in terms of finding the necessary foreign exchange, but this excess demand is in turn a product of a socialist shortage economy where firms face "soft budget constraints" and related phenomena typical of this kind of system.  If China were to succeed in establishing a true market system, the current exchange rate would probably be seen as markedly undervaluing the Chinese renminbi.

3.  The issues discussed in the paragraphs that follow are discussed at greater length in Dwight H. Perkins and Shahid Yusuf, _Rural Development in China_ (Baltimore: Johns Hopkins Press, 1984).

4.  State Statistical Bureau, _Weidade shinian_, p.128.

5. State Statistical Bureau, _Zhongguo tongji nianjian_, 1988, p.6.

6. This point is made at greater length in Dwight H. Perkins, _Agricultural Development in China, 1368-1968_ (Chicago:  Aldine, 1969), Chapter IV.

7. D. Gale Johnson, "Economic versus Noneconomic Factors in Chinese Rural Development."

8. The $135 is obtained by dividing the average state purchase price for all grains in 1987 by the official yuan-dollar exchange rate of 3.73 yuan to 1 dollar.  World prices in grain are reported separately by crop so it is not possible to compare these in any precise manner with this Chinese figure.

9. See Nicholas Lardy, _Agriculture in China's Modern Economic Development_ (Cambridge: Cambridge University Press, 1983) pp192 - 195.

10. The unit value of Chinese imports of cereals in 1988 was $123 per ton based on China's customs statistics.

11. These figures were derived from Council for Economic Planning and Development, _Taiwan Statistical Data Book, 1987_, p. 240, and Economic Planning Board, _Major Statistics of Korean Economy, 1989_, p. 208.