# AGRICULTURE IN ASIA

by Colin Clark



### FORUM OF FREE ENTERPRISE

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"Free Enterprise was born with man and shall survive as long as man survives."

> —A. D. SHROFF (1899-1965) Founder-President, Forum of Free Enterprise.

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#### By COLIN CLARK\*

To Australians agriculture means tractors and combine harvesters. Some of the older people may remember when there were still horses in general agricultural use in Australia. But the horse itself was a technical improvement introduced into European agriculture only in the eighteenth century. Before that our ancestors used ox-ploughs. Their methods of agriculture differed little from those described in Virgil's Georgics, or from those in use today throughout most of Asia (with the minor qualification that in some parts of Asia the buffalo, a larger and stronger animal than the ox, is the source of tractive power).

But it would be quite wrong to describe this as 'primitive' agriculture. Although introduced millennia ago the ox-plough must be regarded as an important technical advance. The simplest form of agriculture is performed without any animal power at all, with the use of hand hoes and 'cut and burn'. This is the way in which agriculture began. Primitive though it appears to us, even this form of agriculture represents a very great advance on living simply by hunting and fishing, as do still some Australian.

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aborigines, and the inhabitants of a few other parts of the world. In 'cut and burn' agriculture, the men of the tribe each year fell a patch of scrub (our remote ancestors performed this task, as some men in New Guinea still perform it, laboriously with stone axes), leave it to dry in the sun, and burn it. This temporarily clears the ground of weeds, and supplies a limited quantity of fertiliser from the ash. A crop is then cultivated with hand tools—wooden digging-sticks in the case of the most primitive tribes, otherwise iron-plated hoes. After two years or so, except on the best soils, the fertility is exhausted and the land again weed-infested; and the poorer soils cannot be cultivated at all by this method. The land which is capable of cultivation generally has to be rotated over a cycle of about twenty years; with any shorter cycle the crops become much poorer.

This form of 'cut and burn' agriculture is still practised over nearly all 'Black Africa' (i.e., Africa, excluding South Africa and the Mediterranean coast). It is only possible for tribes who possess an abundance of land. Professor Gourou, the world's best authority on the geography of the tropics, estimates the amount of land actually cultivated in Black Africa in any one year at only 3 per cent of the whole.

In Black Africa however there is another reason for the persistence of hand-hoe agriculture, namely the prevalence of the tse-tse fly, whose bite is fatal both to oxen and to horses. This pest can be kept in check—as it is in some parts of East Africa—only by careful clearing of the scrub which harbours it, which in turn is only possible in comparatively densely populated land, with an adequate labour force.

It is an interesting speculation whether it was Asia's comparative freedom from this pest which, in the distant past, made possible the step to more advanced civilisation than Africa's based on ox-plough

agriculture. It is however of considerable interest to note that communities practising 'cut and burn' agriculture are still to be found scattered over Asia, though socially and economically isolated from their neighbours. These include some of the Montagnards in Vietnam, some mountain tribes in Taiwan, the Hanunoo in the southern Philippines, the inhabitants of substantial areas in Sumatra and some of the other outer Indonesian islands, and even in India and Pakistan, countries generally believed to be densely populated throughout, the Gonds in the hill country in Central India, and tribes on the extreme eastern border of Pakistan adjacent to Burma.

These types of agriculture are usually collectively described as 'subsistence agriculture'. I must confess to being co-author of a book under this title which does not define as it should the phrase 'subsistence agriculture'. The concept, which has not yet been subject to precise definition, is that of the farmer who is mainly occupied in producing food and other agricultural requirements for his own family and immediate neighbours, rather than produce for marketing to distant consumers, as with our farming.

The word 'subsistence' has many meanings, and is sometimes used highly emotionally. Australian wage earners will sometimes describe their income as 'mere subsistence'. It is as well, for our present purposes at any rate, to confine the word to its precise scientific meaning; of food requirements for the maintenance of health and bodily activity.

The basic requirements for the maintenance of bodily functions, warmth and activity can be precisely measured in energy units known as calories. A person not receiving sufficient calories will feel hunger. In addition, we require our food to contain proteins, which are not required to give energy, but to perform the necessary maintenance work on the bodily organs and muscles, and to provide for growth in children and adole-

scents. Protein shortage does not cause the sensation of hunger. But, if long continued, it has very serious medical effects, particularly on children. At one time it was thought that one could not be healthy without a substantial proportion of protein from animal sources in the diet. This proposition is now known to be incorrect; vegetarians can live perfectly healthily with only a minimum intake of milk or other animal protein. However in addition to calories and protein, the body requires a variety of vitamins and minerals, in small quantities. In certain diets the supply of these is defective; but these defects can fairly easily be put right.

Many people still believe the extraordinary misstatement that two-thirds of the world is living in a permanent state of hunger, i.e., insufficiency of calories. This statement was originally made in 1950 by Lord Boyd-Orr, the first Director-General of the World Food and Agricultural Organisation. This statement was shown by M. K. Bennett, Director of the Food Research Institute at Stanford University, to have been based simply on the confusion of two columns in a statistical table.\*

This was followed by an almost equally misleading statement issued by the World Food and Agriculture Organisation (F.A.O.; a branch of United Nations) first made in 1957, to the effect that half the world's population was malnourished. F.A.O. gave no evidence for his statement, nor even a definition of malnourishment. It took them some years to issue a statement in which they defined as malnourished anyone who did not eat as much as the inhabitants of Western Europe. To describe such people, many of whom are suffering medically from over-eating, as defining the borderline of malnutrition, is ludicrous.

F.A.O. then proclaimed a standard of 2300 calories per person per day as a minimum requirement.

<sup>\*</sup> The World's Food, Harper Bros., New York, 1954.

This claim was made ridiculous by the Australian anthropologist, Margaret McArthur, † who showed that if the F.A.O. standards were true, a large proportion of the population of Japan was starving—and this is a country where most families own television sets. The Japanese just do not have the eating habits of Europeans—and are probably in better health for it.

Furthermore, if the F.A.O. standards are correct, almost the whole population of China died out some years ago. China's food supplies have been far below this level; though for some reason F.A.O. has never drawn attention to this.

In any case it is highly mistaken to set a single calorie standard for the whole world. The caloric requirements of a population vary with: (a) the proportion of women and children in the population; (b) average body weight of adults; (c) temperature (less required in a hot climate); (d) proportion of time spent in hard physical activities. The actual average requirements of Asian populations may be as low as 1600 calories per person per day for a small-bodied people, as in South-East Asia, in a hot climate, not fully engaged in hard physical work throughout the year. The figure rises to 2000 for the northern Chinese, among whom the exact opposite of each of these conditions prevails.

The estimation of protein requirements is a far more difficult physiological problem; and there have recently been considerable changes in previously accepted conclusions. Total protein requirements may be estimated at about 25 grams per head per day, for children as well as for adults (i.e., a much greater input of protein per unit of body weight is required in the case of children). On an average reckoning, any Asian family living predominantly on rice, maize, or any other of the staple grain crops of Asia, which contain between 8 and 13 per cent

<sup>\*</sup> Journal of the Royal Statistical Society, 1984.

of protein, will be receiving well above its protein requirements. However, bio-chemists have some doubt about the proteins from maize. Furthermore, nobody knows how food is distributed within the family, and whether the children get their due share. One of the few firm figures which we have indicates that 17 per cent of school children in the Indian State of Maharashtra showed clear medical signs of protein deficiency. Grain diets should be supplemented by legumes or ground nuts, the high protein foods most readily available in Asia. Animal protein foods, such as dried milk or fish meal, undoubtedly contain proteins of the highest quality, and have been shown to have rapid and complete results in treating malnutrition, when they are available.

There are also a few areas in Asia where the staple diet consists not of grains but of root crops. Here the dangers of protein shortage are very grave indeed, as root crops contain hardly any protein.

The American economist Buck, working in China in the 1930's, and the Dutch economist De Vries, working in Indonesia, introduced the useful concept of 'grain-equivalents' for measuring agricultural output. All other agricultural products are expressed in terms of grain, not by their calorie equivalents—if we do this we understate the value of the high-protein products, and put no value at all on a useful product such as cotton—but in accordance with the rates at which they actually exchange in local markets. To provide the calorie requirements above specified, some supplementary protein and vitamin foods, cotton or other fibre for clothing, and some allowance for unavoidable waste, storage losses, etc. the true 'subsistence' requirements of an Asian population can be stated, in round figures, at 250 kilograms (one quarter of a ton) of grain equivalent per head of population per year.

De Vries prepared the following useful classification of the stages of agricultural progress:

Agricultural output per head of population per y e a r — kilograms of grain equivalent

Under 300	Subsistence hand-tool agriculture or grazing.
300-500	Subsistence hand-tool agriculture or grazing with some trade.
500-750	Agriculture with draught animals and grazing herds.
Over 750	Mixed farming including the feeding of grains and concentrates to pigs, poul- try and other animals.

Where the figure is below 250 the people will, in the true sense, be going hungry. The first increases which they obtain above this level will naturally be mostly consumed in the form of food. However one of the worst mistakes which we make is to assume that more food is Asia's sole, or even predominant requirement. Even when output is only some 400 units (with hunger level at 250 units), the farmer begins selling part of his output; not for the sake of doing so but because he has other urgent needs besides food, for clothing, building materials, and many other commodities, perhaps including something for medicine and education. Family expenditure studies for low-paid wage earners in Asia tell us the same thing, namely that even if the world's purchasing power were redistributed, and the whole of Asia had more to spend, the greater part of the expenditure would be on non-food commodities.

We may now observe the level at which the East Asian countries stand, and their rates of progress:

	Agriculture head of popin Kg. of w	Average pe year rate growth—	tes of		
		No <b>n</b> -Food		Agricul- tural Pro- duction	Popu- lation
Burma	567	22	589	2.1	2.2
Ceylon	377	241	618	3.0	2.5
India	346	36	38 <b>2</b>	2.0	2.3.
Indonesia	465	60	525	1.5	2.4
Malaysia	410	543	953	3.9	3.0
Pakistan	372	60	432	2.3	2.2
Philippines	678	32	710	3.2	3.6
South Korea	418	17	435	4.7	2.5
Taiwan	619	33	652	4.3	3.4
Thailand	587	65	65 <b>2</b>	5.0	. 4.0

Non-food agricultural production includes rubber, tea, cotton, etc.; and is mainly for export.

India is uncomfortably close to the subsistence line, bearing in mind the great internal inequalities which prevail (the distinctions between the castes remain very marked indeed, particularly in rural areas). Malaysia has the most advanced agricul-

tural economy, followed by those of the Philippines, Taiwan and Thailand. In India, Burma, Ceylon and the Philippines agricultural production has failed to advance as rapidly as population—though there are encouraging signs of recent improvement in India. On the other hand, there are some high rates of increase of agricultural production per head of population in Malaysia, South Korea, Taiwan and Thailand.

As has already been pointed out, 'cut and burn' agriculture is only possible for tribes possessed with an abundance of land. Moreover, they only aim at producing not very much more food than their subsistence requirements. Why do they not produce more, and sell it, and make progress towards a more advanced economy, it may be asked. The reason is summed up in one word; transport. Most of Black Africa, and many of the remoter regions in Asia, are entirely lacking in transport. All that they possess are rough paths over which goods have to be carried on men's heads. Under these circumstances, if they did produce more grain, they could not sell it, except at prohibitive transport cost. To meet their small cash requirements, for buying implements, textiles, etc., they tend to produce higher valued crops, such as coffee, which call for less transport per unit of money earned. In these sparsely populated regions there is not enough man-power to construct and maintain a road, even if they had the necessary knowledge, equipment and materials. But once some benevolent outside authority constructs a road for them, how quickly the situation changes. Vehicles appear from somewhere—even in the remoter parts of New Guinea you find enterprising indigenous road transport contractors—and within a few years, now that produce is saleable, the whole face of agriculture changes.

But 'cut and burn' agriculture, while it lasts, has its compensations. It is an easy life. The amount of grain-equivalent to be produced is only

300-400 kilograms per year per head, and the adult women do as much agricultural work as the men. so that each worker has to support only one or two dependants at most. So each active worker only has to produce about 800 kilograms of grain equivalent per year. Under normal conditions of 'cut and burn' agriculture, approximately one hour's work on the average is required to produce one kilogram of equivalent. So the average agricultural working year is only about 800 hours. Even after adding the time which the subsistence farmer has to spend in building and repairing his house, and other duties, he still has a great deal more leisure than most of us have. Let us hope that he enjoys it. Experienced observers say that he does not, and limits-more would be happier if he had-within work to do.

This does not mean, however, that he would willingly change places with the 'ox-plough farmer', who certainly has to work considerably harder than the 'cut and burn' farmer.

But is it not the case, as is generally believed, that all Asian farming communities suffer from enforced leisure, or disguised unemployment, or underemployment, or rural over-population, whichever you prefer to call it?

One of the firmest believers in this theorem was none other than Mao himself. In his book Socialist Upsurge, published in 1956, he stated (one does not know from what source he obtained his information, which was entirely inaccurate), that one-third of the Chinese agricultural labour force was unoccupied, and could profitably be transferred to industrial or public works employment. This was actually attempted in 1958, 'The Year of the Great Leap Forward'; and the resulting chaos in Chinese agriculture has not yet been fully repaired.

It may seem paradoxical to talk about labour shortage in China. But take a country the size of

China, and prepare a programme to cultivate it with hand hoes — there are hardly any draught animals, and fewer tractors, and the cultivation has to be very carefully done. You will soon find that you need some 600 to 700 million people.

Economic planners, whether Maoist or Keynesian, tend to think of the agricultural labour force in man-year units, and to plan how many of them they can transfer to other employments. They must be trained to think in man-months. In much of Asia (though not all) there are extreme seasonal differences in labour requirements. In the monsoonal climates, which extend over large areas in India, Pakistan, and Burma, there is a long spell of dry weather and enforced idleness, followed by the breaking of the monsoon, after which cultivation and rice planting have to be carried through at top speed, and there is always a labour shortage. In Korea, also the working season is similarly limited, in this case, through drought, but through cold. Acute labour shortages again occur at the time of rice planting and harvesting, in June and October. Where the climate is warmer and more humid, however, as in the southern-most part of India, or East Pakistan, and the cultivation of rice can be supplemented by growing jute and other crops, the sharpest irregularities of labour requirements can be mitigated, though not entirely removed. In Korea and East Pakistan some industrial employers take labour from agriculture during the slack season, and release it again during the busy seasons. But this is not very satisfactory for the industrial employers, who really need a steadily working qualified labour force.

In Japan however part-time industrial employment is more of a reality. The labour shortage in Japan is now so acute, that industrial employers, particularly small sub-contractors, are willing to offer employment to farmers' families even for the broken periods of the winter months. Some Japanese farmers have now so diversified their farm programmes,

away from the predominant rice-culture of the past, with its sharply peaked demands for labour, to vegetables and livestock, that they are able to keep their labour steadily occupied throughout the year.

According to the traditional 'Law of Diminishing Returns', the more labour you put into a limited area of land, the less return you get from each unit of labour. But this is not a full description of what happens. Those who think so have failed to read the small print on the contract. The 'Law of Diminishing Returns' only holds so long as both technical conditions and social organisation remain unchanged. The Japanese economist Ishikawa has made a very interesting comparison of the productivity of land in Asian countries, expressing all outputs in equivalents of tons of unmilled rice to the hectare (2.47 acres). While the Law of Diminishing Returns prevails, generally speaking, within one country, at any given time, it certainly does not prevail when we make comparisons between countries, or between periods. In India, in Maharashtra State, the maximum labour input among the farms reviewed was about 1500 man hours per hectare per year, yielding an average of one ton of rice equivalent per hectare. In Madras State, where more intensive methods are used, the maximum labour input was nearly 3000, and the yield, 2 tons. In Japan, China and Korea labour inputs rise above 5000 man hours per hectare, with vields over five tons. The most extra-ordinary results however are from Taiwan, where on some farms there is a labour input of over 10,000 man hours per hectare (i.e., one man occupying himself fairly fully on only half an acre), with the land double cropped, sometimes treble cropped, yielding 16 tons of unmilled rice equivalent per hectare per year. Taiwan is the only country in the world—not even Japan comes up to it in this respect — where the farmers use fertiliser right up to the mathematically calculated optimum limit.

If we bear in mind that minimum subsistence for one person is a quarter-ton of grain, this means

that some farmland in Taiwan is capable of supporting, at minimum subsistence level, 64 persons to the hectare, or 25 to the acre.

This and other information throws a new light on the so-called 'population explosion'. We have a number of examples, both from the present day world and historically, of densely populated countries greatly increasing the productivity of their agriculture, a task which they would probably never have undertaken had it not been for the stimulus of population pressure. This has been the case with the Dutch in the sixteenth century, the English in the eighteenth century, the Japanese in the nineteenth century, and a number of other Asian countries now. Population growth undoubtedly facilitates industrialisation, and leads to an increase in the rate of saving—though the proportion of children in the population is high, the number of men in their active working years is also relatively high compared with the number of pensioners. This theoretical proposition has been demonstrated in fact by the remarkable recent rise in the rate of net savings in India.

If we analyse National Accounts of Less Developed Countries published by the Organisation for Economic Co-operation and Development in Paris, ranging the developing countries in three groups according to the rate of population growth, namely under 2 per cent per year, 2-3 per cent per year, and over 3 per cent per year, we find that the rate of growth of national product per head is substantially greater in the two latter groups than it is in the former.

However, one consequence of high population density in a rural community, with little alternative industrial employment, is that a high proportion of the product of agriculture is taken in the form of the rent of land. Interesting inter-provincial comparisons can be made in the Philippines where it is seen that price of land has no discernible relation to

elimate, but is predominantly controlled by the density of rural population.

Well-meaning proposals to regulate rents and prices of land by legislation will not really be effective. There are too many ways of evading it, in the face of the strong economic pressure of landless men seeking employment, and willing to pay high rents, in one form or another.

If the majority of families own the land which they cultivate, high rents do not do much harm: but when most of the land is held by a small minority of land-owners, they create unbearable social and political tensions. This is the case, social and political, but not economic, for 'land reform'. The world's experience of land reforms has been very varied, and this question urgently needs further research. some cases the results have been good, in other cases destructive of productivity. Probably the most successful on record was that carried out in Ireland in 1904—by a British Conservative government. Mexican Revolution of 1910 led to great economic as well as political disorder, and the productivity of Mexican agriculture required three decades to recover. It has however advanced very rapidly since then. In India and Pakistan land reforms have been more apparent than real, and in India some half the land is now controlled by the minority of 15 per cent of the larger farms. However, it is upon them, at present at any rate, that hopes of increased productivity are fixed, and so Indian statesmen tolerate this position. Land reforms in Eastern Europe in the 1920s in some cases also affected productivity injuriously. The Japanese land reform of 1945 was not what it appeared to be, because the major part of Japanese land was already held by owner-occupiers before the reform. The land owners were virtually expropriated by the American Military Government - nowhere, outside communist countries, were they so harshly treated. Taiwan embarked on an extensive land reform in the 1950s in which the land owners

were treated a little less harshly than in Japan. The results have been highly beneficial. The Diem land reforms in South Vietnam were not followed up, although the present government has legislated for an extensive program.

There cannot now be many left who are ill-informed enough to advocate Soviet Russia, or China, or Cuba, as a model for agricultural policy. There is clear and abundant evidence of the damaging effect of 'collectivisation' on agricultural productivity. Communist policy created actual famines, in Russia in 1933, and in China in 1961. Famine has been avoided in Cuba through the massive economic aid supplied (in mutual rivalry) by Russia and by China.

It has been observed that the agriculture of some Asian countries produces substantial quantities of export products. Production for export, it is often suggested, is undesirable. Exports are sold on increasingly adverse terms in the world market and, in addition, their prices are subject to violent fluctuation. Beyond this, there is the ignorant Marxian preconception that all such transactions are inherently wrong, and that, by the nature of the case, the primary producing country will always be done down. (What happens then in trade between communist countries, one might ask?)

We soon will not need exports anymore, so many economic planners think, because we are going to produce everything we require within our own country. Never was there a dream so remote from reality. Every country requires international trade, and requires it to an increasing degree, and the small countries require it more than the large countries. Apart from Japan in the Tokugawa Period, which was one of complete economic and demographic stagnation, the only countries in the modern world which have made an attempt to cut themselves off from international trade have been Russia and Spain. Russia under Stalin survived economically, though with very great hardships to its people, because it

was a very large country, with diversified resources. Stalin's successors have been doing their best to remedy this situation, and the subsequent rate of expansion of Russia's foreign trade has been one of the highest in the world. Franco's Spain (before recent reforms) fell to a depth of economic disorder which left it one of the few countries in the world which was poorer than it had been in the 1920's.

If a smaller country attempted to cut itself off from international trade the consequences would be worse still.

The truth of the matter is as follows. Say we take as the normal rate of expansion of real national product, 5 per cent (which is about what the developing countries have attained, on the average, over the past decade), a rate compounded of growth of population, and of growth of product per head. For each 5 per cent expansion of real national product (irrespective of whether it is due to growth of population or of product per head) the volume of imports has to expand by about 4 per cent.

In this way, as the country's economy expands, the ratio of imports to national product ultimately falls. But the process is very gradual.

Nor is it rational to expect that the developing country's import requirements will be met by grants and loans. Even if these are to be made in future at a much higher rate than in the past, they will still provide only a small fraction of the developing countries' imports. A few developing countries are fortunate enough to possess oil or other valuable minerals, which pay for most of their imports. Some pay for their imports principally by exports of manufactures, as Japan has done for the last 50 years, and as Taiwan and South Korea will soon be doing now. But, failing these, the developing countries can only pay for their necessary imports by exports of agricultural produce. There is no other way.

In view of this situation, it is often demanded that world measures be taken to 'stabilise' (implying

stabilisation at a price higher than those which have recently prevailed) world prices of such export products as rubber, coffee, cotton and sugar. Though well intentioned these hopes are vain. They will inevitably involve deliberate restriction of production, which, in the eyes of the farmers affected, would be a still worse evil than fluctuating prices. And, with all these drawbacks, the countries such as Malaysia and Taiwan, which produce substantial exports, are much better off than the countries which do not.

The wealthier countries could, however, do a great deal to help the developing countries, by refraining from those activities of their own which help to saturate the world agricultural markets. Coffee and cocoa are produced only in the developing countries. But the world markets for cotton, rice, maize and wheat have been gravely affected by exports produced, with the aid of subsidies, by farmers in the wealthier countries.

Besides stopping such subsidised production and exports, the other step which the wealthier countries can take to assist the international trade of the poorer countries is to encourage them to produce exports of manufactured goods as soon as possible. Much could be done here by giving such goods preferences in the markets of the wealthier countries (and, meanwhile, the developing countries themselves should cease treating each other's exports so harshly). It is a pleasure to be able to record that Australia has been the first country in the world to pass legislation to this end; though the quantities of goods on which the preferences are given are small.

The views expressed in this booklet are not necessarily the views of the Forum of Free Enterprise.

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