

MULTI-FUNCTIONALITY OF AGRICULTURE:VIEWPOINT OF CONSUMERS' ACTIVITIES

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ABSTRACT

The concept of human beings as consumers belongs to an economic system which demands the self-multiplication of capital. We need to redefine economies as a way in which human beings maintain their lives in a sustainable way.

At present, the global food supply faces a crisis. Asian countries need to recognize the important differences between imported rice and domestic rice, including the social value of agriculture.

CONSUMERS, AND THOSE WHO RE-PRODUCE LIFE

Today, the way in which people are living appears to be unsustainable, for at least five reasons.

- The population is increasing, while the number of farmers, the area of farmland and soil fertility are all decreasing.
- There is a huge wastage of limited energy resources.
- Stockpiles and residues of harmful materials are increasing, and the environment is deteriorating
- One-fourth of all people in the world are unemployed or under-employed, and the gap between the haves and the have-nots is growing.
- There is a proliferation of violence from the trade in drugs and small firearms, and now even nuclear weapons.

It is crucial to find how the world can be made more sustainable. In order to change society, we have to change our view of human beings and our sense of values, as these are the basis of our current socio-economic system. However, it is difficult to change the outlook of capitalism, which could be described as "Money-making for money's sake". Instead, it is necessary for consumers

and workers to decide to change their current lifestyles and outlook on life.

The problem is that the concept of "the consumer" has two meanings. One concept is the consumer who is controlled by capital, and purchases as much as he can. This concept of the consumer mobilizes the huge volume of production, circulation and sales of the capitalist system. The second concept of a consumer is someone who consumes, not for its own sake, but rather in order to maintain and improve his quality of life. He thinks it is very important to live in such a way as to promote a better life for himself, as well as for his children and the generations to come.

When we think of a person as an economic unit in today's society, the three concepts of "the capitalist", "the worker who sells his labor as a product", and "the consumer who buys the product" are basic and inseparable. Workers and consumers cannot exist without the capitalist, while the reverse is also true. We should understand this relationship properly.

Industrialized societies in developed countries are at an unsustainable level as a result of continuing capital accumulation. Unless this is changed, we cannot change the current system. Radical change will involve

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a revolution in our thinking, with at its core the concept of the consumer as the re-producer of life.

The re-producer should give top priority, not only to private benefits, but also to benefits to society in general. He should seek for information disclosure and accountability. He should participate in, and organize, various types of civic association and work with these to improve society. With regard to food and agriculture, the priority should not be whether food is expensive or cheap. What is important is a system of food production that will not deprive future generations of their right to live, and which will not deprive the soil of its fertility or introduce harmful materials into it.

SEEING THE FOOD CRISIS HISTORICALLY

As emphasized by K. Polanyi, in order to find the basis of dominant theory in current economics (globalism, and economics as the exchange of materials with scarce value and the allocation of wealth), we should start by taking a good look at the actual economy in different parts of the world.

Food production cannot be judged only by the price. There was a marked increase in food production after World War II, but this cannot be sustained in the long term. At the same time, the world population is increasing. The number of farmers and the area of farmland are decreasing, the soil is deteriorating, and marine products and resources are in decline. Normally, these trends would be contradictory, and could not occur together. However, technological innovation accounts for this apparent contradiction.

Modern agriculture uses non-renewable resources which cannot be recycled, such as petroleum energy, agricultural chemicals, chemical fertilizer and large agricultural machines. Such products are used to compensate for the reduction of inherent productivity, in terms of the falling area of farmland, the declining number of farmers, and the deterioration in soil quality. They do in fact compensate for this loss, provided there is enough fossil fuel. However, we cannot depend on farming of this kind, because it seems that petroleum energy will be exhausted if we do.

The second constraint is represented by the Ogallala Aquifer in the United States. Covering more than 455,800 square kilometers, this underground water resource is being depleted much faster than streams and rainfall can recharge it. Growers are pumping out water stored over thousands of years, to irrigate their crops. They are using this water as if it is inexhaustible. In fact, this type of farming based on underground aquifers will come to an end when the water is finished, not only in the United States but also in India and China. The biggest agricultural issue in the 21st century is definitely the scarcity of water for agricultural use.

Thirdly, the improved agricultural productivity seen in the period after World War II deprived the soil of the fertility which had accumulated over many years in the past. Ideally, agriculture should improve productivity by making farmland more fertile. However, technical innovations after World War II plundered the soil of its nutrients. A good example was the cattle-raising industry of tropical South America. New ranches were created by burning tropical forests when cleared land became barren.

Similar problems have appeared with the "Green Revolution". Intensive monoculture has led to a long-term fall in productivity. Agriculture in Asia which plunders fertility cannot continue indefinitely. We must change to sustainable agriculture, which makes the land fertile and maintains it for future generations.

Fourthly, modern agricultural technology has replaced the accumulated traditional knowledge of farmers with high capital investment into pesticides, fertilizers, and machinery. Traditional farming had a profound knowledge of the environment, and made use of natural materials. Current agriculture does not pay much attention to traditional knowledge. Some aged farmers in Japan still remember the technical skills that they practiced until they became automatic, but such farmers are now few. From the viewpoint of knowledge transmission, current agriculture has become quite depleted. Thus, it is clear that current technology is no good for sustainable agriculture, even though it may temporarily improve yields.

We have come to realize that improved productivity from current agriculture depends

on temporal factors, and is unsustainable in terms of energy, water resources, fertility, and skills accumulated by farmers. This, together with the increase in global population, means that our food supply is very uncertain.

There are also wider negative effects. Global warming is likely to damage agricultural production all over the world. Agricultural water is already scarce, and likely to become scarcer. Erosion and desertification have become serious over wide areas of what used to be productive farmland.

Table 1 gives an estimate of the negative effect of climatic change on agriculture. It is likely to have a disastrous effect on countries with a large population, such as China, India, and Bangladesh.

For Japan, which has a self-sufficiency ratio for grain of 28%, and for food generally of 40%, the big question must be: Which country will produce the food for Japanese people in 25 years time? In only ten years' time, farmers aged more than 65, (which is most of the farmers at present), will be retiring, because they will no longer have the strength for farm work. And in 25 years time, the world will have to stop depending on petroleum, so that we shall no

longer be using chemical fertilizers, agricultural chemicals and large machines in our agriculture. To survive, agriculture in the 21st century has no choice but to concentrate on "self-sufficiency", and place a high value on the recycling of materials within an ecological system.

Why is self-sufficiency needed? The world's agriculture is facing a tremendous crisis. The world population is currently 6 billion, and is likely to increase rapidly to 8-10 billion by the middle of this century (2001). Sixty percent of these people now live in Asia, and that percentage is not likely to change when the population becomes 10 billion. This means that we have to recognize that the future world food crisis is going to be above all an Asian problem.

Three countries - Japan, Korea, and Taiwan - are often seen as a model for economic development in Asia. All of them have shown a simultaneous decline in the number of farmers, the area of farmland, and the self-sufficiency ratio of their food supply. Currently, this trend is typical of developing economies rather than industrialized ones. Furthermore, such countries nearly always suffer from a shortage of water. We cannot

Table 1. Effect on agriculture of a temperature rise of 2.5°C

Country	Rate of increase in 2100 in comparison with present (%)						
	Rice	Winter wheat	Spring wheat	Corn (temperate type)	Corn (Solgamu)	Cassava	Potato
Bangladesh	3	-87	-	*	*	-	-5
Bhutan	161	-40	-38	-16	1	-	-9
China	10	-15	-21	-40	-54	28	-7
India	-3	-55	-	*	*	5	-39
Indonesia	-2	-	-	*	*	-7	-11
Japan	3	5	-3	-51	9	-	-7
Democratic Republic of Korea	0	-19	-6	-70	-87	-	-6
Republic of Korea	-3	-13	-4	*	*	-	-7
Nepal	-4	-52	-22	*	*	-	-29
Thailand	-4	-	-	*	*	-24	-
Vietnam	0	-	-	*	*	-	-13

regard such a pattern as a model of sustainable economic development.

FOOD SITUATION IN JAPAN, KOREA, AND TAIWAN

Fig. 1 shows the amount of grain produced and imported by Japan, Korea, and Taiwan. It indicates how the food self-sufficiency ratio fell in all three countries, while at the same time all three showed remarkable economic growth. Their self-sufficiency ratio is now less than 30%, while their combined grain imports have increased

to 55 million mt annually. This has been made possible because of grain exports from the United States (Table 2).

The Table shows that the United States expanded its grain exports by 64 million mt between 1950 and 1990. As shown in Fig. 1, Japan, Korea, and Taiwan increased their grain imports by 50 million mt during this period. Obviously, the United States increased its food exports to meet the needs of these three countries.

All three were located near the borders of Russia and China during the Cold War period. Their special strategic location

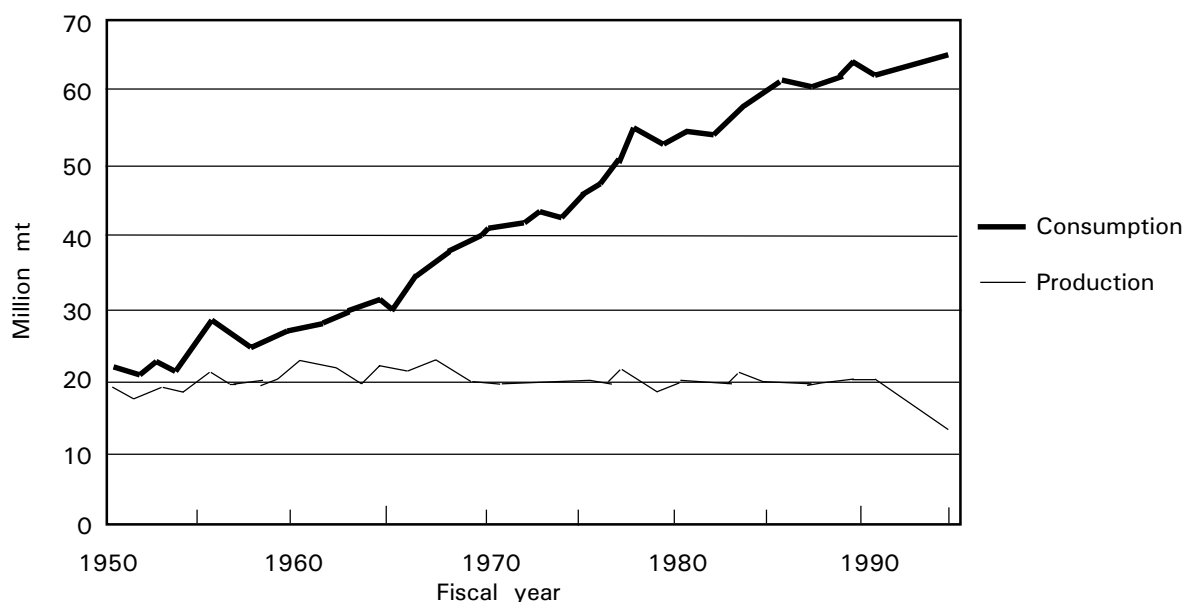


Fig. 1. Total grain produced and consumed in Japan, the Republic of Korea, and Taiwan

Table 2. Production, consumption and export of grains by the United States

Unit: million mt

Fiscal Year	Production of grains	Consumption of grains	Amount exported
1950	133	121	12
1990	290	214	76
2030	377	295	82

Source: World Watch Institute

certainly helped nurture this distorted export-import relationship.

China has now changed its policy of self-sufficiency and is importing more food, currently about 50 million mt per year (10% of food consumption) as a result of economic growth. Other Asian countries have also increased their food imports. The United States, on the other hand, has decided not to increase its food production, in order to conserve exports and scarce water, as well as prevent erosion and convert many farms to organic agriculture.

We cannot overlook the underlying fact that the United States has estimated that the price of food is likely to rise 400-500% within 25 years if it does not increase the volume of its exports. This is because there would be more competition between importing countries for available supplies. In terms of strategy, competition for food imports between China and Japan would be advantageous for the United States. Consequently, we can assume that the global food supply in the 21st century will be closely related to the security policy of the United States.

Background to genetically modified organisms (GMO)

The new technology of genetic engineering has the following features. Firstly, this technology was developed with the ostensible purpose of improving agricultural productivity in a situation of scarcity by means of gene splicing. The underlying purpose, of course, is for the companies developing the technology to make a profit by becoming dominant in the global food market. It is not a technology which is aimed at creating sustainable agriculture, or at enhancing soil fertility using natural systems of nutrient recycling.

Secondly, the results of this technology may be similar to "The Green Revolution", in terms of the increase in production, but like the Green Revolution it may have bad effects in the long term. Thus, this technology should only be used in a crisis situation, when it is really needed.

All the scientists who are engaged in GMO technology are aware of both these points. They are driven, not by the fear of future problems, but by a need to introduce

their technology onto the market as soon as possible, so that their company will succeed in competing with other companies.

Therefore, to depend on GMO technology is a kind of first-aid measure, but it does not make agriculture sustainable. We must accept the fact that our technology, means of production and lifestyle are no longer sustainable. We must choose a new path, and develop agricultural production by sustainable means.

IMPROVING THE SELF-SUFFICIENCY RATIO OF FOOD

There are at least five major differences between the rice produced in Japan, and that imported from other countries.

Domestic rice can protect production and health, while imported rice cannot

Staple foods are the basis of health and nutrition, and of agricultural production in every country. In Japan, the basic crops are rice, wheat and soybeans. They are produced in cropping systems which also produce vegetables and fruits. They are part of a system which includes forestry, livestock raising and fisheries. In order to maintain this production, we must provide a sufficient income to the farmers who keep this complex system running and keep farmland fertile. Imported rice is only a product for sale.

Domestic rice can preserve the environment and rural scenery, while imported rice cannot

Rice can be imported, but the valuable things that go with it – rice fields, water, fertile soil, and rural scenery, which farmers create by producing rice – cannot be imported with the rice. It has been estimated that these additional benefits are worth more than the harvested rice itself.

Once cultivation is abandoned, the control of waterways for rice fields is lost. The foot-paths between rice paddies collapse, the soil begins to erode, and weeds and trees cover the fields. This makes it difficult to start cultivating the fields again at some time in the future.

It is important that we realize how

much the Asian countryside is protected by the people who live and work there. Rice fields and their rural landscape, irrigation systems and fertile soil cannot be imported together with rice. No-one has the right to deprive the next generation of these irreplaceable assets.

Communities and jobs in rural areas are promoted by domestic rice, and threatened by imported rice

Rice production supports local industry and brings jobs. Typical industries are the manufacture of agricultural tools and fertilizers, and the baking of bread, rice biscuits and other foods. Regional communities are based on primary industry. From this develops the secondary and tertiary industries, the so-called knowledge-intensive industries, which generate employment and wealth and make rural communities prosper. These communities develop welfare and culture, and are a treasury of traditional social values. Imported rice would destroy such values.

Domestic rice contributes to food security in Asia, while imported rice weakens it. The International Rice Research Institute has estimated that we will need to increase the production of rice by 70% above the current level to meet future food needs. However, this will be very difficult in the face of a reduction in arable land and a scarcity of water.

Europe and the United States depend on wheat, whereas Asia depends on rice. Japan must help to solve the food crisis by improving its level of self-sufficiency in food, and by developing technology that increases sustainable production. This in turn will need a comprehensive research and development plan.

Domestic rice production transfers sustainable agriculture and forestry to our descendants, while imported rice does not

The Japanese people have been practicing agriculture and forestry for more than 2000 years. If this tradition comes to an end, it will be a major loss for our descendants. They will lose the techniques

and skills which have accumulated during this period. Our ancestors in upland areas over the past 2000 years have, by their system of agriculture, allowed 20-30 cm of fertile topsoil to accumulate on fields. We cannot abandon these fields to erosion. As Schumacher emphasized, fertile soil is the most valuable asset of human beings. We must hand it on intact to future generations.

All people have social and cultural needs, which go beyond the narrow economic needs of the economy as the "distribution of scarcity". People are not made to serve economies; economies are made to serve people. We are responsible for the conditions inherited by the next generation, including resources and traditions.

There is a general economic concept that the best imported goods are raw materials to which high value will be added. In this respect, Japan should avoid importing rice.

THE JAPANESE DIET

The four important rules to follow for a long life are: to eat a balanced diet, to exercise appropriately, to take enough rest and avoid too much stress, and to avoid bad habits such as smoking.

Japanese men and women have the highest life expectancy in the world. Professor Yukio of Kyoto University carried out research while serving with the World Health Organization in 1983 on why Japanese people live so long. He concluded that it is their diet which is the main reason. He suggested that Japanese food is a healthy combination of rice, fish, seaweed, soybean products, vegetables and fruits, and emphasized the need to continue this excellent tradition.

FROM GATT TO WTO

At the World Food Summit in 1996, the statement was made:

"Every country, by making use of its resources, has the right and obligation to enhance its food security. In particular, developing countries have to practice this right and obligation".

This modified the agricultural talks at WTO which followed the bumper world grain

Table 3. Strong points and weaknesses of Japanese traditional foods

Strengths	(Acts to prevent)
Rice, which is almost completely fat-free, is a staple food	Obesity and arteriosclerosis
Fish is an important protein source (taurine etc.)	High blood pressure and arteriosclerosis
Fish is an important oil source (n-3 fatty acid)	Thrombosis, dementia, and high blood pressure
A large amount of seaweed is consumed (fiber, magnesium and other trace elements)	High blood pressure, apoplexy, arteriosclerosis, diabetes
Includes a lot of soybean (protein, n-6-fatty acids, fiber magnesium, iso flavonoids)	Apoplexy, arteriosclerosis, osteoporosis, cancer
Daily consumption of green tea	Cancer (some ingredients, such as catechin, act as anti-oxides)
Weaknesses	(Tends to produce)
Tendency to contain too much salt (exceptional prefectures: Okinawa and Kyoto)	High blood pressure, apoplexy, and stomach cancer
Low intake of animal protein (exceptional prefecture: Okinawa)	Apoplexy and high blood pressure
Low intake of dairy products (good source of calcium)	Apoplexy and osteoporosis
Rather small intake of vegetables and fruits (source of fiber and potassium)	High blood pressure and apoplexy

Source: "Nutrition and Circulatory-organ Diseases: International Joint Research of WHO" Yamori, Y. *et al.* 1996. Long Life and the Japanese Meals. *Seikatsu Journal* (In Japanese).

crops of 1983-84, and the following Uruguay Round talks initiated by exporting countries in September 1986.

Since GATT was established at a time when there was a food surplus, it gave the greatest benefit to the countries that exported surplus food, and to the multinational companies that gained huge profits by the export of food.

A different approach was expressed at the meeting of ministers of WTO in Toronto, Canada, at the end of 1999. At the APEC Summit a month later in Brunei, participants clearly stated that the main task for Asia is to ensure a stable supply of food and water. People from all over the world demanded the same thing in Genoa in July 2001. I expect Japan to play a major role in persuading the world to follow this new path.