

PROSPECTS FOR FOOD SELF-SUFFICIENCY IN THE DPRK

INTERVIEW WITH TOM MORRISON

by Matthew Bates

Sino-NK Analyst

June 2013



PROSPECTS FOR FOOD SELF-SUFFICIENCY IN THE DPRK INTERVIEW WITH TOM MORRISON

by Matthew Bates
Sino-NK Analyst

June 2013

INTRODUCTION | The DPRK's ability to undertake the broad approach to economic reform taken by China and Vietnam has been the subject of some debate. The Chinese government has been very keen to emphasize the relevance of its own experience, gradually liberalizing the economy beginning with the agricultural sector, and initially allowing foreign investment only into Special Economic Zones, thus permitting economic development under authoritarian leadership. Meanwhile, the North Korean government, wary of excessive dependence on a single relationship, has highlighted Vietnam's broadly similar experience as a model.

But it has often been understood that the DPRK economy, having already undergone far greater industrialization (however dilapidated) and urbanization than had China and Vietnam at the start of their reforms, is structurally too different for these specific models to be applicable.

In particular, it has been understood that the DPRK has insufficient arable land to be food self-sufficient, let alone for agricultural reform to support economic take-off in the way that it did in those countries. In order to feed its population, it has therefore been argued, the DPRK ought to adopt a more Eastern European model of socialist transition, boosting its industrial export capacity through foreign direct investment.[1]

But in light of extensive international cooperation with the DPRK on agriculture in the new millennium, are the underlying assumptions about the potential of North Korea's agricultural capacity still well founded? To explore this vital and most pertinent question I interviewed Tom Morrison, an agriculturist and agronomist with experience in over 40 countries who is of the opinion that the DPRK can indeed achieve food self-sufficiency.

Morrison has to date conducted 13 missions to the DPRK over the last 14 years, most recently in October 2012, working for such as the International Fund for Agricultural Development, the Food and Agriculture Organization, and World Food Program, as well as the OPEC Fund and the European Commission.

—Matthew Bates, Sino-NK Analyst

Matthew Bates [MB]: Please could you explain how you believe that the DPRK can achieve food self-sufficiency? Is there not a shortage of arable land?

Tom Morrison [TM]: About 15 percent of the DPRK is arable land. This is often cited, falsely, as being comparatively low and even the prime cause of the DPRK's food deficit, but lots of other countries achieve national food self-sufficiency with less. China and Burma also have 15 percent arable land and they are self-sufficient. Australia is a big food exporter with 6 percent arable land. Indonesia has achieved food security with 11 percent arable.

Taking all the countries of the world, only 10.6 percent of land is arable, so the DPRK's share is well above average.

When arable land per capita is taken into account, the DPRK also fares quite well at 0.11 hectares[2] per capita (ha/caput), the same as Italy, and well above China at 0.08 ha/caput, and Japan at 0.03 ha/caput. China famously feeds one-fifth of the world's population with only one-fifteenth of the world's arable land and in recent history has either exported food or imported relatively little.

So right at the beginning of this answer it is necessary to explain in this tedious detail that the DPRK has more than adequate arable land to achieve national food self-sufficiency.

If one accepts this, then the probable main cause of the DPRK's food deficit is low crop yields. And they are indeed low: historically, regionally and globally. Average yields of paddy rice, the national staple, in 2011 were 3.9 t/ha compared to about 8 t/ha in the 1980s, but had averaged less than 3 t/ha in the late 90s.

When I explained to the Minister of Agriculture in 2002 that in my opinion yields of 15t/ha were



- > Tom Morrison and his counterpart at the Ministry of Agriculture Kim Chol Hun stand in front of a monument commemorating realignment of major canals for irrigation. Together they worked on the first major canal realignment in 1998 to reduce the need for electric pumping and to use gravity, allowing Pyongyang to preserve electricity for other uses. The UN's Food and Agriculture Organisation helped design the project, whilst financial assistance was provided by the OPEC Fund
Image: Tom Morrison

achievable she laughed in disbelief but accepted the challenge that the funds of IFAD (the UN's International Fund for Agricultural Development) should be used to send some farm managers on a study tour to northern Italy, which has similar rice-growing conditions to the DPRK. On their return they told her that 15t/ha was indeed being routinely achieved on leading farms, though the Italian national average was about 6t/ha. The national average yield in Australia is 10.8 t/ha. The world average yield was

4.3t/ha in 2010, but is not really comparable because it includes tropical as opposed to Japanese rice.

MB: *What is the difference between what agriculturists refer to as “Japanese” rice (as grown in the DPRK) and “tropical” rice?*

TM: Japanese rice is the temperate cousin of (more accurately a different sub-species from) tropical rice that is common in much of the rest of east Asia. It is longer growing, higher yielding (potentially by a factor of about three providing it is properly fertilised, unlike tropical rice it has a high response to manuring), and, again by contrast to tropical rice, has only moderate tolerance (as evidenced for example by tillering) to unfavourable conditions. It should not be compared, at least in yield, agronomic,[3] and (outside the DPRK context) international market price terms, to tropical rice.

These agronomic characteristics are mentioned here because, as will be seen, they have relevance to current farming conditions; and the farming conditions and shortage of basic inputs that the DPRK is now experiencing would not have the same impact on food security in a country growing tropical rice. The DPRK now has lower yields than any other country that grows Japanese rice. [4]

Rice varieties available in the DPRK are generally good and up-to-date and are supported by the International Rice Research Institute.

Available varieties of the two other main staples, maize and potato, are also excellent. IFAD [the UN’s International Fund for Agricultural Development] and the Swiss Agency for Development and Co-operation (SDC) have assisted the DPRK to achieve more-or-less state-of-the-art

potato breeding, and disease free seed potatoes are distributed annually to each county. Maize is 100 percent hybrid, something that many countries have yet to achieve. The DPRK is justly proud of its “seed revolution.”

Government has a determined philosophy of national self-sufficiency and food security. Agriculture still produces 21 percent of GDP and employs nearly 40 percent of the population. In terms of national priorities, agriculture and food security take second place only to the army and national defence. Huge resources are diverted into farming, especially urban workers who are bussed out to rural areas during labour peaks.

MB: *How significant are the natural disasters to the DPRK’s food shortages?*

TM: It is true that 80 percent of the annual rainfall occurs in July and August. It seems also true that



- > “80 percent of annual rainfall occurs in July and August. Poor farming practices and deforestation of the hills means severe flooding leading to many deaths each year (these people aren’t dead, they’re just acting). If this is what happens to people, imagine the damage to crops and livestock...” | Image:Tom Morrison

extreme weather events such as winter cold, spring droughts, and the July/August deluges, are more frequent and more severe as a result of climate change.

But it is also true that the DPRK's soils and catchments have been made more vulnerable by many years of mismanagement so that the effects of these extreme weather events are more severe. One obvious example of this is that potato seed stores on individual cooperative farms are either not deep enough or not sufficiently well designed to preserve potato seed until the spring.

One less obvious example is that soils and catchments are so exhausted or denuded that they cannot absorb the July/August rains as they could in the past. This leads to erosion, raised river beds, and flooding of the rice paddies. In 2012 much of the rice was inundated for long enough for it to die through drowning. Proper soil and catchment management would have almost completely mitigated these natural disasters.

This argument has already been won. The DPRK's Academy of Agricultural Sciences, its Ministry of Agriculture and the international donor community agree that Conservation Agriculture (CA) should be government policy, and it now is. For brevity, this is not the place to elaborate what Conservation Agriculture is and the effect it has, but Google it and follow the FAO leads and you can find out that this is successful and the basis of the future of agriculture in the DPRK (as well as much of the rest of the world).

MB: So why is the DPRK in persistent chronic food deficit, even after the extraordinary (and impressive) efforts to achieve food self sufficiency in the year of Kim Il Sung's 100th birthday, 2012?

TM: First, many in the international donor community, including myself, would say it's the system. Farm managers and cooperative farms are generally

not poor. They have the won (local currency) to purchase everything they need. But they don't have the dollars, euros, or more practically the Chinese yuan. Even if they did, only a few have the knowledge on how and where to spend them.

More and more cooperative farms are processing the grain they grow and this means they are allowed to sell the produce on the local market. ("Processing" in this context usually means making noodles from maize, or tofu or oil from soya. North Korean farm managers can then sell it to whoever they want and put the cash into the cooperative farm.)

Added to that, there are rumors that some cooperative farms will be allowed to sell primary produce on the open market. When formally asked about this during the 2012 Food Agriculture Organisation (FAO) and World Food Programme (WFP)'s Crop and Food Security Assessment Mission (CFSAM), the DPRK Ministry of Agriculture's reply was that there would be no formal announcements about it—but they didn't deny it.

Two good first steps would be for cooperative farms to accumulate won, and then to be allowed to convert some of those won into foreign exchange, but even if these steps happened tomorrow, it would take a few years to build the supply chains to deliver the required farm inputs.

It is a shortage of these farm inputs that is the main reason for low yields: a) farm mechanization, b) diesel fuel, c) fertilizer and lime, and d) agro-chemicals. These four are discussed individually below, roughly in order of importance. None is too difficult to remedy, but it is expensive to do so, as all other countries have also found.

A) FARM MECHANIZATION | There is no national policy on farm mechanization, or at least none that has been revealed to the international donor

community that has been asking for one since the early 2000s. The evidence supports the view that there is no coherent mechanization policy or strategy. Shortly after the DPRK was created there was early and heavy emphasis on high levels of farm mechanization. This was, and will continue to be sensible because of the short growing season and the need, at least in some areas and some situations, for double cropping (i.e. two crops in a short growing season meaning short turn-around time between crops, thus high mechanization).



But the tractor technology then and now is 1930s vintage, slow, inefficient and heavy on fuel consumption. Moreover, the maintenance philosophy of that tractor technology is in no way suited to modern tractors, and fuel supplies are insufficient in terms of quality for modern tractors.

Yet we see a few modern tractors (western or Chinese-western hybrids) working on farms, mainly the result of foreign aid projects. Without the spare parts and quality diesel fuel supply chains in place, the life of these tractors is low. The result is that an estimated 80 percent of land is cultivated by oxen. This has certain advantages, but they cannot deliver the capacity, speed and quality that are required.

B) DIESEL FUEL | Worldwide, 80 percent of diesel engine failures are caused by poor quality fuel. Nowhere is this more evident than in the DPRK. There is a western embargo on diesel fuel because of fears that diesel supports the military and navy, and its scarcity is evidenced by the large proportion of lorries, and occasionally tractors, in rural areas powered by wood gas. In spite of the embargo, some diesel fuel is obtained by the government and made available to farms, but

> "...And even rice can drown." | Image:Tom Morrison

generally only 50 percent or 60 percent, rarely 70 percent of requirements. This evidence I have gathered directly in interviews with farm managers almost every year since 2000. Moreover, as already mentioned, the quality is low in terms of sulphur content, and water and dust contamination.

C) FERTILIZER AND LIME | The Republic of Korea used to provide fertilizer free of charge to the DPRK but that stopped in 2010. China provides some on commercial terms. Domestic production of nitrogen fertilizer is slowly increasing but depends on oil and electric power both of which are short. There are some local deposits of phosphate rich soil but not phosphate rock that is the usual basis for phosphate fertilizer. The whole fertilizer picture is quite complicated but the end result is that farms receive grossly inadequate amounts of fertilizer annually.

Moreover, until Conservation Agriculture is more widely adopted, the fertilizer that is supplied will not be sustainable. Nitrogen (N) and potassium (K)

will be leached from soils that have lost their ability to store and hold them, and phosphate, which does not leach to the same extent, will be removed, along with nitrogen and potassium, as part of the current practice of whole crop removal at harvest. Most threshing is centralised at farm HQs, not in the field, because that's where the electric power is, and not all the crop residues are composted and returned to the fields.

Lime has to be discussed together with fertilizer, and the current lime deficit is as serious as the fertilizer deficit itself. The reason is that soil acidity has been steadily increasing since the late 1990s, and this reduces the effect of fertilizer. To increase soil pH to a level where fertilizer can become effective means increasing the amount of diesel allocated to cooperative farms so lime can be hauled from the quarries, and so that coal can be hauled to burn it.

Over the last decade most cooperative farms have received about 60 percent of overall diesel requirement, and even in 2012 when a huge logistical effort was made to deliver more diesel, few farms received more than 70 percent of requirement.

D) **AGRO-CHEMICALS** | The agri-environment is seriously out of balance (that is a whole subject on its own) and one of the ways this is manifested is increasing susceptibility to crop pests and diseases. In the long term this imbalance will be largely addressed through Conservation Agriculture, but in the short term there is an increasing need for agro-chemicals. Most of them have to be imported and there is a serious shortage.

Climate change could be included in this list, but is a bit more ephemeral. One of the least controversial aspects of climate change is that extreme weather events are more common: colder winters, wetter summers, more serious typhoons, more spring droughts. There is also recognition that government can do more about mitigating the effects of these extremes through adoption of Conservation Agriculture. These weather extremes or “natural disasters” as they are called by government, are often accorded a disproportionate level of blame for the DPRK's food insecurity. But it's important to bear in mind that cereal production now would be little different had those disasters occurred or not.



> “Making noodles from maize on a cooperative farm. Processed foods like this can be sold on the free market by the cooperative. The problem is sporadic electricity supply.” | Image: Tom Morrison

MB: How close is the DPRK to food self-sufficiency at present?

TM: The situation now is that, in a year of relatively good weather like 2010, the country can produce about 4.4 million tons (Mt) of cereal equivalent, consumption is about 5.5 Mt, and it therefore

needs about 1 Mt of imports, either commercially or as humanitarian aid. More specifically, the shortfall is made up by the World Food Programme (WFP), the European Commission's regular development programme (the European Commission is also, after the US, the second largest donor to the WFP) and commercial imports.

In a year of comparatively bad weather like 2011, but in which extraordinary efforts were made by the government in terms of fertilizer (up by 55 percent year-on-year) and other inputs such as diesel to achieve national self sufficiency in the lead-up to 2012, the year of the Great Leader's 100th birthday, required imports were still 0.74 Mt. The agronomist (i.e. me) on the 2011 Crop and Food Security Assessment Mission (CFSAM)[5] pointed out that if the weather had not been so severe, the DPRK might have achieved self-sufficiency for the first time since the mid-90s.

So, with luck and special effort, success is perhaps within reach. At least in the medium to long term, there is absolutely no doubt that national food self-sufficiency can be achieved, though we know also that many doubt it.

At a national average yield of 4t/ha, the DPRK is generally about 1 million tons short of self-sufficiency. At 5t/ha it would be self sufficient. At 8t/ha which has been achieved historically though unsustainably, it would have an abundance of cereal grain equivalent, and could export or diversify into more nutritious food. The technology and knowledge to deliver 8t/ha sustainably has been demonstrated and is now government policy. It's just a matter of investment and adopting the right policies to deliver farm machinery, fertilizer, and agro-chemicals sustainably. A daunting task, and massive investment, but a clear one with clear results.

Taking the last 15 years as a whole, the national grain shortfall (milled rice equivalent) has consist-

ently hovered around the 20 percent mark, or about 1 Mt out of about 5 Mt needed. The variation around this 1 Mt has not been large: in 2000/2001 needed imports were as much as 2 Mt and in 2011, as already mentioned, as little as 0.7 Mt.

MB: Why has the problem proved so difficult?

TM: To sum up, first, soil fertility and crop yields are still low; second, there is vulnerability to natural disasters caused by soil and environmental degradation (note that it is not the natural disasters themselves, but the DPRK's vulnerability to them); and third, there is a perennial shortage of critical inputs like fertilizer, agro-chemicals, seeds, up-to-date farm machinery, and clean fuel. But taking more of an eagle's eye view, the overall problem is structural. Put simply, if the State is responsible for everything, then the State and the way it works must be responsible.

Such physical factors, though severe, are perhaps easier to remedy compared to this fourth and most important factor, the weak incentives and rigid institutional mechanisms that still hold down food production on cooperative farms. Structural reforms are fundamentally needed to deliver sustainable food security, something that physical inputs on their own cannot deliver.

MB: What are the prospects for further and more decisive agricultural reform?

TM: There have been some signs of government enthusiasm for possible future liberalization that might lead to real structural reforms that together have the potential to achieve food security sustainably. They include:

- > Some market liberalisation such as farmers markets to allow distribution of vigorous home garden production, mainly small livestock. The 2011 Crop and Food Security Assessment Mis-

sion (CFSAM) was allowed for the first time to enter a farmers market and to conduct interviews.

- > Positive dialogue on the possibility of making sloping land management sustainable (as piloted with assistance from the European Commission and the Swiss). Up to early 2011 sloping land cultivation was “a temporary phenomenon” soon to be obliterated by trees.



> North Korean agriculture as North Korea would like to see it: green. | Image: KCNA

- > Positive dialogue on greater management autonomy for the sub-work teams on cooperative farms, as piloted with assistance from the European Commission (EC) and evidenced by supplies of lower technology and small sized agricultural equipment, including walk-behind tractors, beginning under the 2005 and 2006 direct aid budgets.
- > Enthusiastic endorsement of rural micro-credit (as piloted with assistance from IFAD), though now more or less put in the freezer by DPRK government because it was seen as too successful and threatened to get out of hand. (Bangladesh, the home of micro-credit, has been through a similar experience).
- > Enthusiastic endorsement of Conservation Agriculture, as piloted with assistance from the Food and Agriculture Organization and expanded by the European Commission. This last is, in my view, the bedrock of recovery of DPRK’s agriculture.

MB: What has been achieved thus far?

TM: There have been some impressive achievements towards food security, usually achieved with huge civil mobilisation, including:

Massive realignment of main arterial irrigation canals to reduce the need for pumping. This was a task that a high level FAO Investment Centre mission in the late 1990s, in which I participated, initially held as practically impossible: from both engineering and economic standpoints. We had not factored in the determination of the North Koreans to succeed. None of us on the FAO team had been to the DPRK before. When our economist said in a meeting, towards the end of the mission, that it was not economically feasible, we were given a level look and the answer: “We do not have economics.” No answer to that! The project went ahead with OPEC funding.

Field consolidation to improve the efficiency of mechanization. Cynics said this had more to do with erasing old field boundaries of pre-1953 private farms. That may also be true. But there is no

doubt that when the DPRK finally adopts modern mechanized agriculture this will substantially affect its efficiency.

Seed improvement (their “seed revolution”), including most recently potato seed (leading to their “potato revolution”).

Micro-credit for poor rural households, supported by IFAD, as a way of improving the quality of nutrition. Initially fiercely rejected by Ministry of Agriculture on ideological grounds, then later accepted as an unavoidable component in a loan package for mainly high horsepower 4wd tractors, it was perfectly executed by the Central Bank and over an eight year timespan exceeded all targeted outcomes. Inducements, such as high horsepower tractors, are a proven way of furthering acceptance of donor activities that are less palatable to the DPRK’s government. Although it is understandable that the European Commission is staying cool on this issue, at least temporarily.

Conservation Agriculture (CA), already mentioned, was initially treated with scepticism by the Ministry of Agriculture as being incompatible with the high yields needed for national food security. Now with EC assistance, technically led by FAO, they have adopted it as official policy and the Ministry of Agriculture is keen to expand its reach. This can, and almost certainly will be, the basis for future national food self sufficiency; but it requires, though only for the first two or three years, high investment in farm machinery, lime, fertiliser, and agro-chemicals. After that it’s more or less sustainable and needs lower inputs. Yet Conservation



> “The DPRK can be beautiful...” – Morrison | Image:Tom Morrison



> “...but most farming areas have become deforested and bare.”
Conservation Agriculture aims to promote sustainability through minimal soil disturbance, permanent soil cover and crop rotations. “Plus, the importance of trees in the upper catchment, above the farming areas, has really hit home in recent years. All North Koreans are convinced of that.”
Image:Tom Morrison

Agriculture produces higher yields.

Huckbosan compost is a high quality compost adjusted for pH and fortified with artificial fertiliser and micro-nutrients. It requires a lot of (usually urban) labor to the extent that, according to many farm managers, it may not be sustainable—but it works.

These achievements demonstrate that when the DPRK authorities are convinced of the value of change, they do generally succeed. They also demonstrate the DPRK's steely resolve to achieve national food security. Outsiders who have seen the apathetic dependence culture built around food and development aid in some countries must not be mistaken here. The national food shortages are a source of collective national shame, and serve only to strengthen the DPRK's resolve to eliminate it. Eventually, they will succeed, and step by step they are beginning to appreciate that aid donors have something to offer.

MB: For agricultural reforms to support broader economic development through market mechanisms—in the manner of the Chinese and Vietnamese reforms—it would seem to require not just bare food self-sufficiency but some degree of abundance. What degree of abundance in excess of minimal requirements do you see as realistic and do you envision markets as the most desirable means of distribution?

TM: Abundant food grains are technically within reach, as demonstrated earlier, as well as the diversified diet that is critical for economic growth.

The rest of the world has found that markets are the most efficient means of distribution, and in the DPRK's rural areas the farmers markets held every 10 days (on the 1st, 11th, and 21st of the month) are vibrant and no longer hidden from or denied to foreigners. But no doubt the government will want to continue with the Public Distribution System (PDS).

As a social safety net this is as efficient as any in the world, in my opinion. Though it has failed in recent years, with western aid agencies crowing about its failure, this was only because it had nothing to distribute. The PDS's organisation is moderately efficient, but its storage facilities are very poor indeed. Probably both the PDS and the market system will co-exist for the foreseeable future, as they have done for the last many years.

MB: What has been your experience with the use of micro-finance for projects in the DPRK?

The micro-credit component of the Upland Food Security Project, designed by me and my team, and financed by the International Fund for Agricultural Development (IFAD), was perfectly executed by the Central Bank, with huge benefits to individual poor rural families as monitored and evaluated by an independent Italian team. Middle and senior ranking civil servants were enthusiastic and channelled more of the IFAD's available funds into it, until it exceeded 20 percent of a \$30 million loan. We always knew it was risky ideologically, but we were hopeful it would become conceptually accepted when we learned that a similar scheme had been established in 1954 by Kim Il-sung but had then lapsed due to lack of funds. It's a very efficient way of relieving the misery of the very poor, but until the DPRK recognises that poverty exists there seems little future for it.

The Swiss Agency for Development and Cooperation (SDC) also tried to introduce micro-credit at about the same time as IFAD did, in 2001, but held out for the principle that the government should take the foreign exchange risk, which was refused; the project never got off the ground. SDC's money was a grant; IFAD's money was a loan.

Matthew Bates [MB]: In a recent interview with the BBC, you mentioned how even if agricultural reforms provide necessary incentives to motivate

farmers, markets are often not adequately established to allow farmers to acquire the fertilizer and other inputs they would need to achieve consistent growth in production. How widespread is this problem? Do you see a role for foreign assistance here?

Tom Morrison [TM]: Value chains and private supply chains take time to establish. They seem to be growing slowly because government policy is still vague, though demand is building. It's a widespread problem. It's difficult to see a role for foreign assistance, because it's something that the more naïve aid agencies have been offering for years and the Kore-

ans have their pride. It's something that the Koreans should and can develop themselves. If there is a role for aid agencies, then that would be in delivering the physical infrastructure for such value and supply chains.

MB: The introduction of the notion that farmers retain a certain percentage of what they produce could conceivably lead to a system where farming teams are able to retain a portion of however much they are able to produce, making incentives more robust. But how easy would it be for the government to ascertain the actual amount produced by farmers?



- > Since originally working together on canal realignment to reduce the need for electric pumping, Tom Morrison and his counterpart from the DPRK Ministry of Agriculture, Kim Chol-hun (right), have collaborated on several projects, most recently on Conservation Agriculture. Li Hak-chol (left) is an Irrigation Engineer. | Image: Tom Morrison

TM: This is well established and clear, as one would expect in a country that measures and controls everything. And where the culture dictates that the collective benefit is set above that of an individual, and was set out in detail by me in the 2008 Crop and Food Security Assessment Mission (CFSAM). But I was impressed with the system, and was left in no doubt that it worked well and fairly in practice. Generally speaking, agrarian societies the world over have sophisticated ways of measuring crop yields and the value of non-monetary inputs. This system has occasionally been abused on both sides, during the Stalinist era in Russia for instance, but there were repercussions for the abuse.

MB: In the agricultural reforms of China in the late 1970s some of the most northerly provinces, such as Heilongjiang, elected to retain greater collectivization on the basis that the hard, dry quality of soil demanded the more heavily mechanized production processes of larger groups. Does this represent a recognized argument amongst modern agriculturists? If so, might it have any potential applicability to the DPRK today, in North Hamgyong province for example?

TM: I don't know the answer to this one. There are strong arguments on both sides. The Heilongjiang argument was put forward before Albania turned its back on communism, but at independence each rural household re-established its old field boundaries within hours, and even took "their" bricks out of the communal buildings. In the DPRK I suspect this won't happen. Cooperative farm managers are usually genuinely elected, or at least seem to be, and on the whole of the Korean peninsula respect for the commonly owned institution, whether that is the chaebol conglomerates in the ROK or the cooperative farm in DPRK, takes precedence over individual farm households.

Incidentally, "hard dry soil" sounds to me like a civil servant's argument—something nebulous and easy

to cite because no one is responsible for it. Lack of bank finance for small farmers to buy or rent farm machinery would be a more realistic reason.

Until recently I was Non-Executive Director on the Board of a 74,000 hectare Ukrainian farming company. We paid monthly rents to a large number of small land owners so that we could cultivate their land consolidated into large fields using very big farm machinery. This provided optimum returns for the company and for the smallholders. It illustrates that, theoretically, there can be a hair's breadth between farming under capitalism and under communism. But practically, only the capitalist model works in my view. This model is now common in Russia and Kazakhstan, as well as Ukraine. The army has similar scale operations in the DPRK.

I've referred above to the nationwide programme of field consolidation during the last decade. Officially it is to improve the efficiency of farm machinery operation, though more probably it was to erase old and formerly individually held farm boundaries. But the Japanese colonial archives probably have the old records. There is no doubt that there is huge (though of course never articulated) pressure from individual farm households to increase their 30 pyeong (about 100m²) private garden plots. Only naïve newcomers in the international aid community try to raise this point for discussion with the authorities who keep it firmly off the agenda. Under a freer rural economy there would probably be a readjustment of the balance between collective farms and private plots.

MB: James Lewis, University Lecturer in traditional Korean history at Oxford, told me that in traditional Korea the northern dry soil was used to grow soy beans, such as millet, potatoes and vegetables, whilst the wet paddy fields in southern Korea acted as the country's rice basket. With this range of climates, Korea, China, and Japan were all apparently able to become successfully autarkic, as far as food production was concerned,

and Seoul's geographical position as a point for exchange between north and south is one key reason it became the historic capital of Korea.

This account would give a broad context to the low rice yields you describe, and also suggests a scenario in which the DPRK might become an exporter of potatoes and vegetables without being self-sufficient in rice. Is there a significant difference between the prospects for the country reaching the aggregate food production target required for food self-sufficiency and the prospects for it being self-sufficient in rice? Or does Conservation Agriculture sufficiently alleviate such soil issues, making this much less of an issue?

TM: Yes, I suppose that historically a capital city would have been established near the rice bowls of the peninsula, and in DPRK now the two main rice bowls are close to Pyongyang. Rice has a mystical and cultural quality for the Koreans. Potato on the other hand produces more calories per unit area than any other crop but is regarded as modern. It is fast becoming very popular. Yes, the DPRK could quite logically have a deficit of rice and a surplus of potato. The northern dry soil and southern wet soil concept is a bit simplistic. In the North they would love to grow rice and do wherever they can, but on the whole they can't. Rainfed potato is more suited. In the south potato is grown in the upland areas more and more. Each farm has its paddy land (rice) and its upland (maize and early potato). I could go on. Are you enlightened or more confused now?

MB: Just to make sure that I understand, is it that, whilst you are not completely dismissive of the northern dry soil/southern wet soil concept for rice growing, the reason you are saying that it could be too simplistic is that overemphasizing the broader northern versus southern climate distinction overlooks the importance of the local geography (upland versus lowland) as a reason for the dryness or wetness of soil?

TM: I've got all the rainfall records somewhere, but from what I remember the rainfall in the north is more or less the same as in the south. But the north is more hilly, and they don't have the large areas of flat land suitable for developing paddy fields. So they grow rainfed crops such as potato and wheat. This could loosely be described as dry soil. In the south there are several areas of flat land that are suitable for developing paddy fields. All paddy fields are of course irrigated and to control weeds the soil is puddled, i.e. made a bit like thick soup. This can be described as wet soil, I suppose. Next to the southern paddy areas, on each farm, there is also the upland which is also generally rainfed, not irrigated. This soil is just as dry as the northern upland areas. Here mainly maize is grown, also some early crop potatoes before the maize on the same ground. In the north there is less maize and more potatoes, but the potatoes are main crop, not early crop, so they occupy the ground for the whole of the growing season, as does maize. In the south, as I said, maize follows potatoes on the same ground.

Morrison is as authoritative a voice as we are likely to find to claim that the DPRK's food shortages are not due to the lack of arable land. The labour-saving and resource-saving Conservation Agriculture approach to agricultural development, now adopted by the DPRK Ministry of Agriculture, seems to offer all the benefits which might be associated with a "Chinese" model of economic reform, where yields may increase even whilst labour requirements fall, supporting further development elsewhere in the economy. Yet Morrison's judgement indicates that much work is to be done. One example he points to is in 2012, when bad weather prevented the DPRK from achieving food self-sufficiency, despite huge labour efforts and agricultural inputs. Morrison is clear that greater progress depends partly on more supply of economic inputs, including imported fuels such as diesel—an import which is subject to Western embargoes.

In addition to Conservative Agriculture, the other component of agricultural reform most emphasized by Morrison is structural reforms. Structural reforms means improving the incentives for improved performance by focusing on the reducing the size of farming collectives into smaller working groups, such as quasi-family units or sub-work groups (as under China's reforms), and allowing farmers to keep more of their produce to sell at commercial market prices. Though high barriers exist, growth based on agricultural reform now seems much more possible than a model based on foreign investment and rapid price liberalization.

CONCLUSION | Tom Morrison seems as authoritative a voice as we are likely to find to claim that the DPRK's food shortages are not due to the lack of arable land. The labour-saving and resource-saving Conservation Agriculture approach to agricultural development, now adopted by the DPRK Ministry of Agriculture, seems to offer all the benefits which might be associated with a "Chinese" model of economic reform, where yields may increase even whilst labour requirements fall, supporting further development elsewhere in the economy. Yet Morrison's judgment that in 2012, only bad weather prevented the DPRK from achieving food self-sufficiency (after huge labor efforts and agricultural inputs) also indicates that much work remains to be done to attain abundance. Morrison is clear that greater progress depends partly on more supply of economic inputs, including imported fuels such as diesel—an import which is subject to Western embargoes, although I have never come across any Western criticism of this primary Chinese export to the DPRK.

In addition to Conservative Agriculture, the other component of agricultural reform most emphasized by Morrison is structural reforms. Structural reforms means increasing the incentives for improved performance by focusing on the reducing the size of farming collectives into smaller working groups, such as quasi-family units or sub-work groups (as under China's reforms), and

allowing farmers to keep more of their produce to sell at commercial market prices. Though high barriers exist, growth based on agricultural reform now seems much more feasible than a model based on foreign investment and rapid price liberalization.

Given the lack of faith in the domestic currency and in the absence of conventional deposit-account banking, monetary tools to control the inflation have no mechanism of transmission. Therefore, in the medium term, increases in the supply of core necessities through alternative reform plan, such as through Conservation Agriculture, may be the only way to promote macroeconomic and social stability to support relative economic liberalization.

—Matthew Bates, Sino-NK Economics and Trade Analyst

NOTES

- [1] The best exposition of this argument is found in Noland, Marcus, *Avoiding the Apocalypse: The Future of the Two Koreas* (USA: Institute for International Economics, 2007), Chapter 7. Noland's 23 January 2013 blog post on "The Vietnamese Model" still, if more tentatively, inclines towards the view that differences in economic structure restrict the potential of the Vietnamese model.
- [2] A hectare is a metric unit of surface or land equivalent to 10,000 square meters or 2.471 acres. See: <http://en.wikipedia.org/wiki/Hectare>.
- [3] Agronomics is the branch of economics dealing with the distribution, management and productivity of land.
- [4] Japan, Republic of Korea, North China, New South Wales (historically and probably still the holder of the world's highest recorded yield for rice), Southern Europe (e.g. Italy and Spain), California, and South America below 30o latitude.
- [5] Crop and Food Security Assessment Mission. Usually an annual autumn event conducted by the FAO and WFP.

FURTHER READING

- On Conservation Agriculture: [UN Food and Agriculture Organisation](#)
FAO/WFP Crop and Food Security Assessment Missions to the DPRK: [2003](#), [2004](#), [2008](#), [2010](#), [2011](#), [2012](#)
- Randall Ireson (coordinator of the American Friends Service Committee agricultural development program in the DPRK between 1998 and 2007): [Food Security in North Korea: Designing Realistic Possibilities; Why North Korea Could Feed Itself](#)
- Christopher Green, "[6.28 Back on the Docket?: Economic 'Improvement' Hints Return](#)," *Sino-NK*, May 13, 2013.



© 2013
<http://sinonk.com>