Bananas in China
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This paper reports on a visit to three out of the five banana producing provinces of China carried out by Dr. Iain Farquhar in May 2012, on behalf of Banana Link and the Steering Committee of the World Banana Forum. The visit was funded by the Charles Leopold Meyer fondation pour le progres de l’homme (fph). The logistics of the visit were organised and interpretation was provided by Dr. Tan Xuewen of the Rural Development Institute, Chinese Academy of Social Sciences.

The visit aimed at achieving three objectives:

1. To get a picture of the Chinese banana industry (as far as possible looked at through the optic of sustainable development);

2. To ascertain whether there was any interest from stakeholders in the Chinese banana industry in participating in the work of the World Banana Forum and/or in receiving exchange visits from the latter’s participants;

3. To gauge whether it would be possible or appropriate to encourage Chinese producers to adopt “The New Paradigm” for banana production, discussed at the Second World Banana Forum meeting in Guayaquil., Ecuador in February 2012.

Although China is not a major exporter of bananas, it is the second largest producer in the world after India. The Steering Committee of the World Banana Forum discussed on a number of occasions whether or not it would be appropriate to include China (and India) in the forum and concluded that, while the main focus of the Forum would remain on fruit produced for export, nevertheless it would be desirable to invite non-exporting large scale producers like these two to participate without them necessarily becoming full members.

This report will be divided into 3 major parts (I, II and III), with each part corresponding to the three objectives noted above.

I. The Chinese Banana Industry

1.1 Patterns of Production

Roughly 413,000 hectares of land were cultivated with bananas in 2010 with a total production of around 9.85 MT, according to FAO estimates provided by the Hainan Institute of Tropical Agriculture.

However there is some uncertainty about the figures. Official Chinese estimates were lower and the FAO figure was apparently derived from satellite imaging (and production levels then induced from estimated average yields). Furthermore, as will be seen later, the industry has been subject to considerable instability deriving from both natural causes (frosts, cyclones and disease) and market fluctuations (largely driven by rumour and speculation), adding to the uncertainty.
The area under production fell in the subsequent year and was estimated to be around 5,050,000 Mu (15 Mu = 1 Hectare) or roughly 370,000 hectares (366,667) in 2011 with overall production remaining roughly the same as in 2010.

Banana production in China has grown rapidly since the 1980s with the area cultivated more than tripling from 1990 to 2010 and production more than quadrupling in the same period.

Five provinces account for the vast majority of production with Guangdong producing 2.8 MT in 2010, Guangxi 1.9 MT, the island of Hainan 1.5 MT, Yunnan 1.2 MT and Fujian 0.7 MT. However the devastation caused by Fusarium Wilt (or Panama B disease), coupled with encroachment into agricultural land in the Pearl River Delta region is leading to a decline in production Guangdong.

Meanwhile, highly mobile entrepreneurs (often described as “speculators”) have opened up new areas of banana production in zones not yet affected by Panama B in Guangxi Autonomous District and most strikingly in Yunnan Province. The impression was given by agricultural academics that the Chinese system of monitoring land use and production is not wholly rigorous and no official estimates were available regarding recent changes. However both academics and itinerant producers reported anecdotally an extremely rapid expansion in Yunnan.

Unfortunately, it was not evident prior to arriving in China that this shift in production was occurring and Yunnan was therefore not included in the visit. Instead visits were confined to the three highest producing provinces (based on the 2010 data). The journey started on the island of Hainan, continued through the South-West of Guangdong (the South-West of the province contains the counties with the highest concentration of banana production) and finished in the banana producing region around Guangxi’s capital city, Nanning.

Although most production occurs south of the Tropic of Cancer, only the south of the island of Hainan at the extreme southern tip of the Chinese mainland enjoys a truly tropical climate with year round high temperatures. All production on the mainland has the potential to be affected by short spells of low temperatures (and even occasionally frosts) during the winter. Even Hainan can occasionally be affected though this is more unusual. A greater threat to Hainanese production comes from cyclones which can potentially flatten entire crops.

The perennial danger of damage from low temperatures means that producers on the mainland have to time their crops to minimise the risk of damage. This means that, although there is some variation, different regions aim to harvest at particular times to meet seasonal markets. Southern Hainan could in principal harvest at any time but it is financially advantageous for its producers to time their own harvests so that they do not directly compete with other regions. Northern Hainan is more likely however to be threatened by cold weather and is therefore more restricted in the timing of its harvests.
The production zones can be divided into three regions. The Northern Region, including Yunnan Province and Guangxi Autonomous District, tends to harvest between October and the subsequent February. Its bananas are often called “autumn and winter bananas”. This market season covers both the New Year’s Day and Spring Festivals.

The harvest in the middle region, including Northern Hainan, Guangdong and Fujian Provinces lasts between June and October, a period which includes the Dragon Boat Festival, the Middle Moon Festival and National Day. These bananas are often called “Zheng Zao Bananas” (presumably derived from the Chinese words Zhengyue, the first month of Spring and Zao, to produce).

South and South-west Hainan (including the so called “Golden Corridor” of Chinese banana production) tend to harvest between March and mid-June when there is no competition from the other regions. These bananas are often known as “Out-of-Season Bananas”).

While most harvesting is timed in this way, it was found that individual producers did not always follow the conventional regional pattern. Some producers preferred to take risks which could lead to financial losses but which could also, if they were lucky, lead to great rewards. If a northern producer was lucky and avoided cold damage, for example and if a cyclone then devastated Hainanese production, they might be able to cash in on the high prices following supply shortfalls in the “Out-of-Season Bananas”.

As will be seen later, a significant number of producers operated in more than one region (or even more than one country). In such cases, losses from risk-taking in some of their plantations could be offset by more cautious management in other regions while the disproportionate gains from risk-taking could potentially yield financial benefits over the entire range of operations and over a time-frame of a period of years.

1.2. Three Major Types of Operation

Three major types of operation were to be found in all three provinces visited (and informants reported that patterns in Yunnan and Fujian were broadly comparable), although the mix of these types varied from region to region.

The first type which in fact represented only a small minority of production is reminiscent of production in much of Latin America and Africa. This typically involves fairly large plantations, fixed on a tract of land with continuous production occurring over a period of years, the older operations dating back as far as the late 1980s or early 1990s. These operations tended to be the best managed. A few had permanent packing plants and some cableways (although these are not very popular in China) and all had good irrigation systems (including in one case a very sophisticated computer controlled system of drip irrigation with integrated nutrient delivery, driven by Israeli pumps). They tend to have permanent management teams and tend to have close links with academic institutions. In some cases, these were “Dragon Companies” i.e. companies which had
established a reputation for good management, on-going financial success and good production values. In spite of their reputations, such companies did not appear to be able to establish brand recognition or brand loyalty amongst Chinese consumers. Only one farm of this type visited actually directly employed labour. All the others relied on the same systems of sub-contracting noted below in the description of the second type. Like the other types of operations, these well-managed plantations had often suffered serious losses due to Fusarium Wilt or were under threat from the disease. However early detection and prompt action to contain infection enhanced the chances of avoiding the devastation seen in some of the less well-run farms.

The second type was much more prevalent than the first and appeared at the time of the visit to still be on the increase. This type of operation looks very different from typical operations seen in most countries participating in world trade in bananas. It appears to have emerged and rapidly expanded as a result of at least three factors: first, the Chinese pattern of land ownership; secondly, the way that agricultural markets have been liberalised in China in a series of stages since Deng Xiao Ping’s initial reforms in the 1980s; and thirdly the availability of considerable amounts of speculative capital.

At its best, this second type of operation appeared to be well-managed. However, taken as a whole, it could provide a fertile ground for the spread of infections and could destabilise the banana market, sometimes allowing fortunes to be made but simultaneously decreasing incentives for the first type of operation to continue to pursue more socially and environmentally responsible long-term strategies.

The second type of operation involved entrepreneurs who were not necessarily tied to a piece of land and who may or may not have had long experience in bananas or even in agriculture in general. In some areas, they had prior experience of working in bananas (as in the case of some academics who also had their own banana producing businesses, aimed at supplementing the often very low incomes paid to them for their academic work). They might come from a particular region and might have built up contacts with local people over a period of time before launching on their own production.

In some other areas, they appeared to be simply businessmen, who may have worked in completely different sectors and who simply saw a chance to make money during a period when banana production appeared to be particularly lucrative. In some cases they had financial backers/investors who had made their money in, for example, real estate or coal mining (often from a distant region in another part of China). Some of them could be described as ‘wheeler-dealers’, entrepreneurs who had learned about bananas as they went on. Even those who came from a particular region and also started in that region, often started ventures in other provinces (or even other countries) where they had little prior experience. At the time of the visit, many were expanding into neighbouring countries (primarily Myanmar and Laos) where labour and land-rent costs were lower than in China.

Farmer/businessmen/entrepreneurs of this kind typically relied heavily on local managers and fixers. Time perspectives for each individual operation were often very short lived.
(from as little as one to three years) and all work was subcontracted, whether to ‘worker-couples’, teams of workers or agents.

Before describing how tasks were divided between the individual players, it will be helpful to say a little about patterns of land-ownership in China. Individual land-ownership appears to be very rare in China (and absolute individual land ownership may possibly be legally non-existent). However various individuals and entities have rights over the use of individual pieces of land. During the Maoist period, individual ownership of land (whether by small farmers or by the land-owning classes) was abolished and land was collectivised. China has been settled and its population has been so dense for so long that there is little land which is wild or undeveloped. Where such land did exist, in some cases, families who have cleared land in recent times have also been able to establish property rights in perpetuity or at least for a long period of time but such arrangements are very rare.

In the final analysis, all land belongs to the Chinese state. However control of most agricultural land is vested in the hands of the Collective, which more or less corresponds to the local village and its population. Following the break up of most Collective Farms, village Collectives assigned individual tracts of land to family members of the Collective. These families have the right to use the land as they please to grow their own food, to produce cash crops for the market or even to rent out to others. Individual families often have several such pieces of land, sometimes dispersed over a fairly wide area. In many Collectives, the villagers cannot manage all the land available and the extra land is not assigned to families. Instead such spare land can be rented out by the Collective’s Committee to businesses or individual businessmen. (Committee members are elected by all the members of the Collective.)

The money gained from rent can be used in a variety of ways. In some cases, Committee Members may manage to keep some of the money themselves in ways which might be regarded by outsiders as ‘corrupt’. However in a small community this is unlikely to be very extreme and would be most likely to take the form of holding banquets for visiting dignitaries or arranging expenses-paid business trips (which may or may not ultimately benefit the Collective). It is difficult to establish a clear line between what would be seen as desirable practices to ‘oil the wheels’ of commerce and politics and what could be seen as a misuse of rent moneys. In the better run Collectives, rent moneys would be used to invest in infrastructure (collective projects, improvement in village facilities) and to help families in extreme financial difficulty.

Arrangements made between Collectives and businessmen who rent are variable. In some cases, businessmen have paid out significant lump sums for rent in advance and have thereby gained the right to use land (or to sub-let it) for extended periods of time (up to 30 years). In other cases, initial lump sums paid were small and businessmen were bound by contract to pay a fixed amount of rent for the period of time agreed. In still other cases, annual rents are not fixed for long periods but are renegotiated every few years.
Businessmen who paid out large sums in advance some years ago are often now in very good financial positions. Land rents have increased rapidly in recent years and a businessman who has rights over large areas of land can now sub-let to other farmer/businessmen and, if he likes, simply live on the rents. More usually however, businessmen rent some of the land to others and then pay rent to some other businessman for other land, often in a different province. In some cases, the first tenant has signed a long-term contract with a subtenant to rent the land and this subtenant has in turn then rented to another at a higher price and he to another. Sometimes therefore there are a series of rent-takers intervening between the original owner (the State or the Collective) and the actual land user.

This land-ownership pattern would appear to have important consequences for long-term sustainable management of the land. As the people who are actively farming the land may be renting it on an annual basis, and might move on after one, two or three years, there is little incentive to think about issues like long-term soil management. On the other side of the coin, the pattern may have advantages too. In many cases a tract of land will be used for bananas for only a very short period of time (2 to 3 years) and then the farmer/businessman will move on to another piece of land nearby or even to somewhere completely different. This means that some pest problems require very little intervention, reducing the need for expensive and environmentally damaging agrochemicals. Although nematicides were used, for example, the levels of use appeared in general to be low and farmers did not consider nematodes to be a serious problem.

Day to day management of the plantations is left in the hands of two other parties. The farmer may keep a close eye on the farm and on technical issues himself but more frequently he appears to be an occasional visitor to each individual plot, except during the harvest when he may be more in evidence. More typically the farmer will employ a manager or technician who will be responsible for keeping an eye on several plots and instructing or advising the worker-couples when to apply fertiliser, irrigate, spray, etc. Such managers may have been scientifically trained or they may have learned on the job or from their family or community, when they worked their own peasant holding.

Most of the practical daily work is done by the ‘worker-couple’. Couples (usually married couples with children) will sign contracts with the farmer to work on a particular plot. The size of plots varies from province to province, according to local conditions but typically ranges from between 40 to 70 mu (2.67 – 4.67 ha).

On the whole, the worker couples are not closely supervised and can work as and when they please (although it should be noted that in the Type 1 operations described above the same system of worker-couples is also used and in some of these operations the couples are required to work particular hours, usually corresponding to an eight hour day). Typically they reported working an average of 8 hours per day during the week. They are not paid directly for their work but instead are paid a price per kilo for the bananas harvested at the end of the season. They receive a monthly advance to cover their subsistence needs throughout the year and these advances are then subtracted from the final payment made at the end of the harvest. The terms of the contracts usually oblige
the farmer to pay a guaranteed minimum annual payment, meaning that the couples’ income cannot fall below this amount even if the harvest is bad or there is some natural or other disaster.

Worker-couples therefore do not directly bare the brunt of either natural or market misfortunes. If the price of bananas is low at the time of the harvest, the farmer still has to pay the couples the agreed price specified in the contract. If a cyclone flattens the crop or if it is devastated by disease, again it is the farmer who loses most (although in this latter case, the couple will also lose to the extent that they will have no chance of earning more than the minimum annual payment). If there is a major disaster like a cyclone, then rather than continuing with the contract, the usual arrangement would be for the couple to be paid the minimum payment for the months already worked. A new annual contract would then be drawn up and the production process would restart from there.

The couple is also provided with simple accommodation, the quality of which varies from very rudimentary to slightly more substantial. The quality of this accommodation appears to be roughly comparable to that provided for workers in many parts of Africa and Latin America (in those cases where plantations continue to provide accommodation.)

Most farmer/businessmen interviewed preferred to hire migrant worker-couples (from other provinces in China) than local couples. Migrants were better motivated, they claimed. Local people did not want to work hard. (There were however also exceptions
where local villagers were hired but this was only observed first hand in Type 1 operations).

Extra labour was recruited at harvest time to carry bananas from the field to temporary packing areas, set up on the edge of plots. Farmers paid a price per kilo carried. The porters carried bunches cut in half on either side of traditional yokes. Groups of porters, which could include women, formed themselves into self-organising gangs. They were almost invariably migrants who followed harvests as they moved around China.

Packing was paid for by the buyers. This part of the work, organised by local agents who hired out their services (for a fee per truck filled) will be considered later.

The third type of operation was carried out by small farmers on the lands allocated to them by the Collective. In some cases, these farms produced only bananas for sale to the market (retaining a small amount of land to grow vegetables and other crops for family consumption.) In other cases, they produced one or more other cash crop (such as papaya or watermelon), in which cases they could rotate crops between plots.

Small farmers and their families did all the work themselves. They often did not appear to have the benefit of extension services or technical advisers (although in some cases technical advice could be obtained from neighbouring Type 1 operations, which would also sometimes help to market peasants’ produce), nor did they usually have irrigation.

In spite of this, the plots inspected all appeared to be well managed and fruit delivered to packing points did not appear to be of lower quality than that produced in Type 1 and 2 operations.

The individual production by small farmers was insufficiently large to attract buyers to set up packing stations on the edge of plots or villages and there did not, in most cases, appear to be a cooperative arrangement which might attract buyers.

Instead, the usual pattern was for buyers to bring the trucks to roadside locations on the edge of small towns. Temporary packing units accepted and packaged bananas delivered to them by large numbers of small farmers in the local area. The cost of delivering to these temporary roadside packing centres had to be borne by the peasant farmers themselves.

In some cases bananas were collected by small trucks (owned by small enterprises and acting as multi-purpose delivery facilities to and from villages.) In other cases small farmers made the journey to “market” themselves in their own simple vehicles, usually the ubiquitous tiny three-wheeled, flat bed truck, known affectionately as the xiao jin niu (小金牛) – “The Little Golden Ox”.

Small farmers would normally be able to find out what prices a number of individual agents were paying on behalf of buyers and choose their buyer accordingly but they were
nevertheless essentially price-takers rather than price-makers and had to accept whatever prices they were offered, within a very limited range.

The mix of these three types of operations varies from Province to Province and from County to County within provinces. In Xuwen Country, Guangdong, for example, the following estimated breakdown was given: 15 large producers with 500 mu or more; 50 – 60 with 300 – 500 mu; more than 200 producers with 100 – 300 mu; many more smaller producers with less than 100 mu (including small farmers with less than 10 mu, this latter group accounting for a little less than 10% of all banana land). It should be noted that there is not a perfect correspondence between size of holding and type of operation. Certainly small holdings will invariably be held by peasant farmers. On the whole the middle range will be occupied by Type 2 operations but some very large operations are also Type 2, even though most of the largest will be Type 1.

1.3. Technical Challenges – most notably Fusarium Wilt (Panama B)

The Chinese industry faces a number of technical challenges. However one challenge, that presented by Panama B, appears to be the most pressing.

At the beginning of the production process, there are at least three major producers of seedlings, using in vitro techniques of vegetative reproduction. There are in vitro seedling producers in Guangdong, Hainan and Guangxi. The largest producer in Guangxi can
produce 80 million plants/year. The principal seedling producers were visited in both Guangxi and Hainan and it was clear that they were efficiently run. Both were associated with University Departments but had become private businesses in recent years and production capacity increased as a result of the injection of private capital. The in vitro process (using a number of media based on Agar containing various sugars and micronutrients at different stages of the process) allows a single sprout to become 5000 sprouts over a 6 month period.

Seedlings are purchased and grown on by a number of independent businesses. These businesses might purchase from the local in vitro producer and from one in another province. The seedlings are planted initially in pots and later directly into the soil in a series of fields, covered with netting, until they are ready to be sold to farmers. There is no shortage of seedling growers so farmers have a large choice, even if they wish to purchase large numbers of plants. One of the major challenges faced by the seedling growers is that of low temperatures during the winter. In the colder areas, seedlings may be covered with layers of plastic when there is a threat of low temperatures.

For growers the main challenges are presented by disease control. Again there are problems with cold weather in most areas and with typhoons, particularly in Hainan. Farmers do what they can to guard against both these dangers but defensive measures can only go so far before they become prohibitively expensive. In some cases, large bamboos were driven into the ground and plants tied to these to provide support. However, approaches like this take time (and money). The principal defences against the cold were covering small plants with plastic sheeting and careful timing of fruiting (by cutting new suckers up until 12 months before the desired next harvesting period). Again, there are no magic bullets and farmers can only do their best. The university institutes and the in vitro seedling businesses closely associated with them are searching for varieties which will tolerate the cold. Although some have been found or developed, the flavours of their fruit have not been good enough for the market, meaning that the hunt is still on for cold-resistant varieties.

Soil fertility was not generally seen as a major problem. Farmers of all types were able to purchase different mixes of chemical fertilisers, mostly produced in China. However farmers also valued and often used organic fertiliser. Organic fertiliser was however relatively expensive and also required more time to spread, meaning that many farmers felt unable to use as much as they would like. Two farmers in Guangdong reported using 7 kilos of organic fertiliser/plant/year. Another reported using 2 tonnes/mu/year.

Water availability was seldom a problem for large producers but could be for small farmers. Large producers (of both type 1 and 2) had a number of systems of irrigation available to them, offering spray, micro-spray and drip irrigation. Typically water would be pumped from underground aquifers. In South-West Guangdong province according to local informants, 75-80 tonnes/mu/yr of water would be required for drip irrigation systems, 105 tonnes for micro-spray and 150 tonnes for normal spray. Peasant farmers were usually dependent on rainfall however. This restricted peasant production to areas where the rain was sufficiently dependable.
As already noted, nematodes were seldom seen as being a problem although nematicides were applied up to 4 times a year in some operations. Insects were also not seen as being a major problem although some insecticides (made in Hainan and in Shanxi provinces) were used. Maturing fruit were sprayed with insecticide (such as Zhen Jia) before being covered with a paper lining and an outer plastic bag (which would not itself be impregnated with an insecticide like Chlorpyriphos.)

Fungal infections were more likely to be problematic. Apart from Fusarium Wilt, two fungal infections were mentioned as being particularly common: one involving white spots on the leaves and the other causing the “internal part of the plant to go black”. Unfortunately linguistic difficulties and a lack of samples to look at made it impossible to be certain which particular infections were being referred to, although the first may have been Yellow Sigatoka. In Guangdong informants reported spraying as often as every 15 to 20 days using what was probably a systemic broad spectrum fungicide for the control of powdery mildew, rusts and leaf spot diseases. In Hainan however an advisor said that fungicides were usually applied only 4 to 8 times per year. An agrochemical supplier in Xuwen County, Guangdong reported selling a Chinese fungicide with the brand name Ping Huang Cuo, which he said was equivalent to (although both much cheaper than and also less effective than) Syngenta’s Tilt. It should be noted that there was no aerial spraying in any of the three provinces and that most spraying was done by hand with one of the partners of the worker-couple typically directing a hose fed by a compressor up into the foliage or down to the roots, according to the particular chemical being applied.

While local producers seemed to be able to successfully deal with most of their own technical problems, there was one problem which continued to elude them. Fusarium Wilt cannot be contained at present by any known fungicide, nor does there seem to be any other foolproof way of controlling the disease.

The commonly held Chinese view is that the disease was originally imported from Taiwan via infected seedlings. More precisely in 2008 low temperatures destroyed the
majority of seedlings which were being grown outside in preparation for a new season. When farmers wanted to plant there were no seedlings available in Hainan and Guangxi. Seedlings were imported into both provinces by a Taiwanese merchant who had set up a seedling Company in Guangdong Province. The original material for producing the seedlings in vitro allegedly came from infected plants in Taiwan, most Chinese believe. Once the disease appeared it spread rapidly in Hainan province, in S.W. Guangdong and in parts of Guangxi. However the disease as yet only has a foothold in Guangxi and is largely being contained. There does not appear to be any infection in Yunnan Province yet, making this an attractive area for investment.

Producers in Hainan reported that a typical pattern of destruction was as follows: two or three plants are found to be infected in Year 1; the infection spreads to about a third of the crop in Year 2; the whole crop is destroyed by the end of Year 3.

The primary strategy for containment involved vigilance and early destruction. Some growers in Hainan were using a mix of lime and formalin to try to eliminate all traces of the disease in the soil around infected plants. An infected plant would be cut down as early as possible, killed using glyphosate, its roots dug up and all the infected material placed in the pit which was left after all remnants of the plant had been dug out. The pit (which would be at least 1.5 metres deep) would be covered with a mix of lime and formalin and then the whole ‘tomb’ covered over with two layers of plastic, the first clear to seal all the material in and the second of black plastic to heat the pit, as sunlight fell on the black surface. An infected plant could be interred in this fashion in half a day. Growers would provide extra labour to perform this task as worker-couples were seen as insufficiently motivated to undertake such a lot of work to deal with just one infected plant and did not, so advisors maintained, understand the necessity of undertaking such radical action.
While this strategy could be effective, it was not necessarily so and it was also highly labour intensive and therefore expensive. It would take 2 workers half a day to complete the pit at a cost of 200 Yuan per pit. Provided that all infected plants are dealt with in the first year, it might be possible to halt the epidemic. However even while existing infected plants were being dealt with, new water or windborne spores might be entering a plantation from surrounding areas, generating new waves of infection.

Growers and scientists are, not surprisingly keen to find a more fundamental solution to the problem. It may be remembered that Panama A made cultivation of Gros Michel virtually impossible and it was only with the development of a new banana variety, Cavendish, that the first version of Panama Disease was overcome. The only final solution to the new variant of Panama Disease, Panama B or Fusarium Wilt, will probably be the discovery or development of a new variety. The hunt is on in Hainan and elsewhere for new varieties.

A number of approaches are being tried. A scientist was touring the region at the same time as our visit (although our paths never actually crossed), collecting samples of local or wild varieties. Research institutes are also taking samples from the meristems of plants which have survived when others around them have died from the infection, in the hopes that these plants will have developed natural resistance. These samples are used to generate new plantlets in vitro. A number of new cultivars developed in this way may be having some success with lower rates of infection than those seen in neighbouring standard cultivars in at least one case. However it is still too early to say whether or not this is significant and the researchers involved didn’t want any information to be disseminated at this stage, as regards who is doing the research, where it is taking place or what the name of any new cultivar is. Unfortunately one plantation growing a cultivar experimentally was devastated by a storm in the third year of the experiment. This means that there are no results for Year 3 and the Chinese authorities require 7 consecutive years of good results before they recognise a new cultivar. Effectively therefore the experiment has had to start again in one case. There appear to be a number of initiatives like this occurring and there will no doubt be a race to see who can produce a new resistant variety first – if indeed a successful new cultivar can ever be developed, which is by no means certain.

Some producers believe that high levels of organic fertiliser can prevent infection. This was a belief stated by a number of growers independently of each other in both Hainan and Guangdong. It was also a belief held most strikingly by the manager of one particular plantation in Hainan which is famous for the fact that all the surrounding plantations are heavily infected while it continues to be infection free. Apparently this case is well known in China and a number of scientists have visited, taken soil and other samples and attempted to identify why this plantation appears to be immune. So far no convincing explanation has been found. The manager attributes his success to high levels of organic fertiliser use (more than 1 tonne/mu i.e. 15 tonnes/ha.) The plantation in question is part of the San He Company, owned by Hainan’s Chief Scientist, Zhang Xiyan.
It is possible to envisage various explanations for how organic fertilisers might help to discourage Fusarium Wilt. Typically the Wilt will arrive on a piece of land as a wind-borne spore. It will land and begin to form a mycelium, which will eventually penetrate the roots of any banana plant it finds. The mycelium grows up through the root ball, destroying the base of stems and eventually sending out a fruiting body from an infected stem which will go on to distribute further spores. When the Wilt first lands it must face competition from a wide variety of fungi, all of which may also be trying to establish mycelia in the same area. Many of its competitors will be other kinds of Fusarium. It may be that a soil rich in manure or compost encourages competitor species while making it more difficult for the Wilt to establish itself. Alternatively, it could be that there is something chemical in one of the fertilisers sometimes used (for example chicken droppings were used in some cases and these tend to have rather acid chemical profiles). There may alternatively perhaps be some structural reason: Fusarium Wilt might develop more easily in soils which have little soil structure, while residual soil structures derived from mixed-in plant or animal material may make it more difficult for the Wilt to develop its mycelium. It could be simply that Fusarium Wilt has little chance of surviving in a soil environment which is teeming with other life and that its best chance of surviving is in a comparative soil desert, while being fed basic essential nutrients (NPK and micronutrients) in the form of chemical fertilisers.

What was not clear at the time of visiting the surprisingly resistant plantation was how systematic the research carried out so far had been and whether this had focussed on organic residues and their impacts on soil populations or not.

What was clear is that Chinese researchers seemed to be particularly keen to develop collaborative research relations with people outside China to deal specifically with the issue of Fusarium Wilt and that the World Banana Forum was seen by many as a potentially appropriate location to foster such research collaboration.

1.4. Economic Challenges

A number of factors have made the Chinese industry subject to instability. The financial instability of the banana market was a matter which was of particular concern to university academics and to the Type 1 Operators described above. It also had potentially devastating impacts on the lives of peasant farmers. For some of the Type 2 operators however, instability was as much an opportunity as a challenge. Fortunes could be made and are being made in the Chinese banana industry. However, wherever fortunes are made there are often actors who lose proportionately and this certainly appears to be the case in this sector.

Sources of instability come from all directions. At the technical level, we have already noted that production is threatened by cyclones, by periodic low temperatures and by disease (specifically Fusarium Wilt). In 2010 and 2011, for example, both Guangdong and Guangxi suffered 2 consecutive cold winters with December and January temperatures falling to between 2 and 5 degrees centigrade. Typhoons also hit Hainan in
2010 and 2011, destroying large areas of bananas. (The last typhoon occurred on April 21st 2012).

At the consumer end of the market there have been two major shocks. In 2007 there was a serious consumer scare. Journalists got hold of the idea that bananas caused cancer and prices paid to farmers fell to as low as 0.2 Yuan/Kilo (from around 2 Yuan) overnight and remained at low levels for a considerable period of time. To put this in perspective, there had been a series of food scandals in China, including (some three years before) the infamous incident of a milk company using cheap poisonous materials to bulk out its powdered milk for children (the perpetrators of this extraordinarily callous crime which killed a number of babies were eventually executed by the State!) Following this milk scandal, confidence in the emerging Chinese dairy industry completely collapsed and anyone who could afford to would insist on buying foreign rather than Chinese produced dairy products. However the distrust was not confined to dairy. There were other incidents and other sources of concern and many Chinese consumers began to feel that only foreign imports could be trusted. Rumour and distrust spread rapidly in a population of consumers whose confidence had already been badly shaken by a realisation that some food producers were prepared to completely disregard public health for the sake of gaining short-term profits.

Prices and confidence in bananas slowly recovered and by 2010 banana producers were being paid more than 4 Yuan/Kilo at a time when supply was insufficient to meet the
demand. Then the industry was hit again by a new rumour. In 2011, a journalist “revealed” that a poisonous chemical (ethylene or “yi xi li” in Mandarin) was being used to ripen bananas and the price paid to producers fell again to 0.4 - 0.6 Yuan/Kilo. Of course, anyone who knows about fruit knows that ethylene is produced naturally by several fruit, including bananas, during the ripening process but this was no comfort to the consumers who by now were suspicious and believed that the industry was simply making up a story to protect its financial interests, while the journalist was seen as bravely standing up for the truth. Prices remained at low levels like this until a new, somewhat bizarre factor began to influence the market.

In April 2012 a dispute between China and the Philippines over the ownership of a small island in the South China Sea, called Spratly Island, came to a head. Spratly Island must be around 500 miles south of Hainan’s southernmost tip. It is some 200 to 250 miles from Vietnam, Malaysia and the Philippines and all three have claimed ownership at one time or another. However China maintains that it is a Chinese territory and the Republic took exception when Chinese fishing vessels were forced to leave the island’s fishing grounds by the Filipino fleet.

In April 2012 Chinese customs authorities started to impede Filipino imports of bananas into China, claiming that cargos failed to meet phyto-sanitary standards. (Insect eggs were allegedly found in one boat for example and the boat was placed in quarantine.) The blocking of Filipino banana imports went on throughout May. It is possible that the seizing of containers of bananas and the dispute over the island were two entirely separate and unrelated issues (which is what the Chinese government maintains officially). However there is considerable press speculation that the two are linked and certainly more than one banana agent said, as banana prices started to rise “that will teach the Filipinos not to steal OUR land!”

Initially the blockade of Filipino bananas had no impact on banana prices as there were plentiful supplies of imports already ripening within the Chinese mainland. However in the second half of May, the disappearance of imported bananas started to have a major effect on prices. At the beginning of May the price paid to farmers was 0.3Yuan/Jin or 0.6 Yuan/Kilo. On Sunday May 13th prices to farmers in South-West Guangdong rose rapidly from 1.4 Yuan/Kilo in the morning to 1.8 Yuan by lunchtime. In the early afternoon farmers in the field who had not yet harvested were being offered 2.2 Yuan/Kilo in advance and prices were still rising by mid afternoon when the visit had to move North and contact was lost with the market makers.

The instability of the market has made it attractive to financial speculators. Physical disasters, the spread of Fusarium Wilt and the sudden losses of consumer confidence have driven some producers out of bananas and encouraged them to either abandon farming or to turn to other crops. This in turn has led to periodic shortages and sudden price rises. High prices have attracted speculative investors to get involved in the banana market.
The expansion of land devoted to banana production in Yunnan Province has already been mentioned (and also Chinese led expansion outside China in neighbouring countries). We have already noted the way that land rents are organised in China. One of the effects of the speculative expansion in Yunnan has been to drive up rents to levels which large producers who are involved in several regions regarded as unsustainable. (Prices for land rents in Yunnan had at the time of the visit reached about 3,500 to 4,000 Yuan/mu; at the same time an established Company like the San He Company reported paying only 150 Yuan/mu in Hainan!) One trader reported that a speculative bubble had already burst in neighbouring Myanmar and he predicted that the Yunnan bubble would also burst within the next 2 years. Meanwhile Chinese investors were planting in Laos where rent and labour costs were very low.

Some observers also noted that though retail prices often rose to reflect supply shortages, the high retail prices did not always translate into high prices paid to producers. In other words it was claimed that the hidden hand of the market’ didn’t always work in practice.

1.5 Distribution of Value

It has already been noted that the Chinese market is highly unstable and has been for some time (at least since 2005). External shocks of a variety of kinds have led to shortages and gluts and these have impacted on prices. The unusually (for the banana world) short time-frame of operations (notably type 2 and 3 operations) means that many farmers rapidly cut or cease production entirely when prices are low. Some, notably the peasant farmers (Type 3 operations) may have little choice. They cannot afford to lose money year after year. Type 2 operations may be more flexible. The bigger and more established operations of this type can bear losses even for two or three years in succession, provided they remain profitable over a ten year time frame. Nevertheless many Type 2 operators will stop planting or will even abandon established plantations in the face of low prices.

As farmers reduce production, shortages inevitably follow and prices can rise rapidly. Those, who are producing in the right season when prices peak can make fortunes. A loose consortium of Type 2 operators in Hainan reported that they knew another businessman who had harvested 180 mu (a mere 12 hectares) of bananas in the previous year in Yunnan in the January – March period. He had made 2.3 million Yuan net profit (approximately £230,000 or US$345,000).

Occasional profits like this lure loose speculative money from other sectors. Particularly mentioned were investors who had previously worked in real estate and coal. Both these sectors enjoyed strong expansion in recent years and traders/investors/speculators have been able to amass fortunes by working in them. However, they have both begun to decline and occasional high profits in the banana industry have attracted capital away from these and other sectors.
The result has been a boom and bust economy which has distorted agricultural production patterns and land rents, particularly in Yunnan (and now beyond in neighbouring countries).

When the market is so unstable and prices so variable it is difficult to analyse the Distribution of Value along the chain. Prices paid to farmers are particularly unstable (one sudden price change occurred as a result of an external shock during the visit as has already been noted above.)

Farmers’ costs are also extremely variable with, for example, land rents ranging from a tiny 80 Yuan/mu (for an old established contract) to a massive 4,000 Yuan in Yunnan. There are also differences between provinces and even between counties within provinces.

A reliable analysis of the Distribution of Value would require either the gathering of exhaustive information or the use of random sampling. Neither of these was possible in the time-frame of a short visit. Nevertheless a considerable amount of data was collected in an unsystematic way during the visit. The rough description of the Distribution of Value which follows is not intended to be authorititative but is rather an attempt to interpret this data so as to give a rough idea of the distribution.

Average values (or means) cannot be quoted as these would be meaningful only in the context of systematic data gathering. Instead rough median or “typical” values are used based on the range of data collected.

1.5.1. Wholesale Price: At the time of the visit the price paid by retailers in the wholesale markets in the north was in the region of 1.8 – 2 Yuan/Kilo.

1.5.2. Prices paid to farmers: As discussed, these are highly variable. At the time of the visit they were around 1.6 – 1.8 Yuan/Kilo. Some Type 2 operators maintained that prices need to be about 2.8 Yuan/Kilo for them to break even. They were losing money at the current prices. Any attempt to assess how much money farmers make from growing bananas must depend on arriving at reasonable estimates for their costs of production.

Farmers’ Costs: Only the major costs will be considered.

1.5.2.i. Rent: The biggest variability was seen in rents. The lowest mentioned was 80 Yuan/mu and the highest (in Yunnan) 4,500 Yuan/mu. The latter was described as being a “crazy rent”. Yield and productivity clearly differed from plot to plot according to natural conditions and management styles. However a reasonable yield was considered to be around 2,500 Kilos/mu. A rent of 1,000 Yuan would mean therefore that the farmer was paying 1000/2500 = 0.4 Yuan/Kilo. A “crazy rent” in Yunnan would push this up to 1.6 Yuan/Kilo, making it extremely difficult for a farmer to make a profit (and indeed impossible given then current farm-gate prices.)
1.5.2.ii. Agrochemicals: Clearly this was variable. In some regions more treatments were needed than in others. One plantation reported spraying fungicides every 10 – 12 days for example, while many others in a neighbouring region said that they did this only 4 times per year. A specialist advisor said that 4 – 8 times per year was typical in Hainan.

Some farmers use considerable amounts of organic fertilisers while others rely entirely on chemical fertilisers. Many mix the two. It should be noted that Type 1 and Type 2 operators would almost invariably need to pay for organic fertiliser and this was expensive and also expensive to transport. They therefore had a financial incentive to use agrochemicals in preference. Conversely, many peasant farmers had their own livestock and other crops which, along with field margins, could provide compostable material. Peasant producers could use their own free sources of nutrients to keep agrochemical bills to a minimum.

Discussions with Type 2 operators and an agrochemical supplier in Guangdong suggest that a typical expenditure on agrochemicals would be around 450 Yuan/mu/year. Assuming the same level of productivity as before this would translate as .18 Yuan/Kilo.

1.5.2.iii. Labour Costs: Unlike the previous two categories of expenditure, there appeared to be very little variability in ‘labour costs’. Strictly speaking, as noted above, there was hardly any direct employment of labour. Almost all work was carried out through subcontracting arrangements. Three major categories of work can be identified.

Firstly and most crucially, there was the work of the ‘worker-couples’. These couples basically performed all the work on the farm in both Type 1 and Type 2 operations. (In Type 3 operations the peasant families would be doing all the work themselves, with occasional reciprocal exchange of labour with extended family members, neighbours or friends.) Occasionally a farmer would provide outside labour, contracted in for the day to do a particular task (such as the digging of pits to contain Fusarium Wilt – a practice which occurred on only a few farms and which was still considered to be fairly innovative.)

Different operations paid the couples slightly different amounts but the variations were within 5% of a mean both within and between regions.) There were slight differences in subsistence payments in advance and in the guaranteed minimum income but when it came to the harvest price, which in normal times would be the only price which was relevant overall, there were only very small differences. 0.4 Yuan/Kilo was typical.

In addition to paying the worker–couples, the farmers had to pay the porters or stevedores who carried the bunches of bananas, suspended on yokes, across distances which could be as far as 500 metres. They were paid 3 Yuan/yoke load. If a weight of 20 Kilos is assumed, then the cost to the farmer would be .15/Kilo. (in Type 3 operations, peasant farmers would harvest themselves or exchange help with others.)

1.5.2.iv. On top of the major expenses listed above, farmers had to pay for technicians and physical infrastructure (if these existed). The extent of these were highly variable.
Type 1 Operations would all have administrative buildings and a number of administrative, technical and managerial staff. In almost all cases, they nevertheless also used the ‘worker-couple’ system, reducing the need for admin and support considerably.

Type 2 operations varied. Some of the large operations had substantial head offices in the countryside (and maybe several in different regions) and they would need to employ a number of manager/technical advisors to advise or direct the couples on agronomic matters and for example to order and mix chemicals (although the actual spraying would be done by the couples themselves.)

A single manager/technician would probably be able to advise at least 10 couples and wages for such staff tended to be roughly double that of the couples. Taking this into account, management would probably add the equivalent of about another 20% of a couple’s income onto the per kilo price i.e. a bit under 0.1 Yuan (0.1 Yuan would actually be 25%).

Many Type 2 operations were less organised with a single poorly paid manager advising large numbers of couples. Smaller Type 2 operations, often belonging to individuals who themselves had formerly been family farmers but who had now become low-level entrepreneurs, employed no managers at all. In such cases it was the individual owner who managed a small number of couples (perhaps from 2 to 5) himself.

1.5.2.iv. Summary of Farmers’ Principal Costs per Kilo:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost (Yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>0.4</td>
</tr>
<tr>
<td>Agrochemicals</td>
<td>0.18</td>
</tr>
<tr>
<td>Labour:</td>
<td></td>
</tr>
<tr>
<td>Couples</td>
<td>0.4</td>
</tr>
<tr>
<td>Porters</td>
<td>0.15</td>
</tr>
<tr>
<td>Managers</td>
<td>0.1</td>
</tr>
<tr>
<td>Total</td>
<td>1.23</td>
</tr>
</tbody>
</table>

Likely Total From 1.3 to 1.6 Yuan per Kilo

It is not surprising that many Type 2 operators, perhaps paying higher rents and supporting larger and more complicated infrastructures, reported losses when prices paid to farmers were between 1.6 and 1.8 Yuan/Kilo.

It should be noted that whereas small peasant farmers may face other disadvantages (lack of scale in purchasing inputs and in selling, lack of infrastructure like irrigation and technical advice etc.) their production does not incur many of the above costs. Usually their land will be rent free. Their agrochemicals bills will be lowered through the use of organic fertiliser. They do not generally employ any hired labour nor pay for any form of management. They may incur some costs transporting their bananas to market (either by hiring space in one of the small trucks which serve the villages or simply through paying
the fuel for their own “Little Golden Oxen”) but on the whole they can keep all the money gained from sales.

1.5.3. Local Agents: Local agents are hired by buyers (often at a distance) to source fruit and to supervise packing and loading onto trucks. The 30 tonne trucks used can take 2,750 boxes (weighing between 10 and 12 Kilos each). These trucks (which have a crew of two drivers and one security guard) can reach any part of China (including even the remote North-Western province of Xinjiang) within two and a half days, using China’s extensive, modernised motorway network.

Packing is carried out by packing gangs which usually have their own equipment (one or two collapsible tanks for washing the fruit, scales for weighing how much goes in each box, tables for working on, etc.). This can be set up at any location, either by the side of a road in informal banana trading and packing zones in the outskirts of towns or at the edge of fields (in cases where a plantation is big enough to supply a significant proportion of a truck load).

Agents sometimes also have one or two sets of packing equipment in case, during a peak period of demand for packing, a gang with its own equipment cannot be found. In such periods, a short term gang might be formed using local people and the agent’s equipment.
The packing gang is paid by the buyer but organised by the agent, who also pays the farmer/farmers, using money wired through by the buyer (usually but not always in advance). The agent himself receives a fixed payment per truck from buyers of between 1,000 and 1,200 Yuan per truck. As each truck takes around 30,000 Kilos, the agent will take only a very small part of the final retail price of a kilo, around .03 Yuan/Kilo.

1.5.4. Packing Crews: Packing Crews received 1.1 Yuan/box. As boxes weighed around 1.1 Kilo, this meant that the crews kept .1Yuan/Kilo.

1.5.5. Buyers: Buyers who sold to wholesalers would keep the money paid to them by the wholesalers (at the time of the visit 1.8 – 2 Yuan/Kilo), less the prices paid to the farmers (1.6 Yuan), the cost of the agent (0.03Y/Kilo), the cost of the packing (0.1 Y/Kilo) and the cost of transport. Unfortunately no figure could be obtained for transport costs. For northern markets these must have been at least 0.1 Yuan/Kilo, leaving a profit for the buyer of between 0.0 and 0.2 Yuan/Kilo at current prices.

In some cases, supermarket buyers bought directly from farmers (using local agents.) In such cases, the supermarkets would be able to keep the retail price less the above expenses, allowing them presumably to make adequate profits.

1.6 Conditions for Workers and Small Farmers

1.6.1. The Worker Couples:

It has already been noted that worker-couples are not employed in the conventional sense but are instead paid at harvest, usually around 0.2 Yuan/Jin (0.4 Yuan/Kilo). They share risk with the farmer/entrepreneurs, in the sense that they will earn more from a good harvest and less from a bad harvest. Clearly the level of their earnings will reflect their own efforts and skill to a certain extent but their earnings may be reduced for reasons which are beyond their own control (they are usually required to follow instructions when it comes to disease management and if the advice is poor they will suffer low yields; levels of irrigation will also often be determined by management; and, of course, natural disasters like cyclones or frosts may hit their crop).

While they share some of the risk, they do not share all of it. If prices are low at harvest time, they will still be paid the amount specified in the annual contract, even if this means that the farmer makes a loss. Furthermore if a natural disaster, such as a cyclone, destroys the crop, the worker-couple is guaranteed a minimum payment. This would typically be around 2,000 Yuan/person/month i.e. 48,000 Yuan/couple/year. The lowest current figure quoted was 1,800 Yuan/person/month. (This had increased from 1416/person/month in the previous year).

Under this system, worker couples could not expect payment until the harvest at the end of the annual agricultural cycle. However normally they could not be expected to be able to cover their own living costs for a whole year before receiving payment. Farmers therefore paid the couples an allowance in advance which was intended to cover normal
daily needs. These payments were in the region of 400 Yuan/month/person (a little under 10,000 Yuan/year for the couple). These payments in advance were intended to cover all the family’s subsistence needs. The total advance payment would be deducted from the final payment after the bananas were tallied at the end of the harvest. Worker-couples who were interviewed reported that the advance payments were generally high enough to cover their subsistence needs.

Accommodation was usually provided by the farmers. This was usually of poor quality. The homes were often a single room with a small toilet and kitchen and frequently appeared to be constructed out of corrugated asbestos sheets (although it is possible that they were composed of some more modern composite material). The accommodation seen in Guangdong Province appeared to be more substantial and of a more solid construction to that observed in Hainan, although this could have been merely chance. In any case the accommodation was generally of a similar standard to much of the poor housing observable in many banana and pineapple producing regions of Africa and Central America.

Without a thorough analysis of the costs of living in the different regions (which could not be achieved during this visit) it is difficult to know how well or badly rewarded the worker-couples were. Nevertheless the overall impression is that they were doing reasonably well. Although accommodation was poor, it was at least adequate. Daily needs could, workers said, be met with the subsistence allowance. This implied that even
if the worker-couples received only the guaranteed minimum payment, they would still end the year some 25 – 35,000 Yuan better off than they had started the year. In a good year the couple could earn as much as 80,000 Yuan (70,000 after the advance payment was deducted).

To put this in perspective, university academics with advanced qualifications and working in research institutions sometimes reported being paid as little as 40 – 45,000 Yuan/year as their regular salaries. Earnings like these, they made clear, were completely inadequate for people living in the cities where universities and institutions were normally located. Academics had to do considerable amounts of additional outside work to earn enough money to survive in the city.

When worker-couples were asked what they did with the extra money they earned they typically mentioned saving and investment in their children’s education. No doubt some of the couples, who were usually migrants, would also be sending remittances home to support elderly relatives or other members of their extended families. Some talked of one day setting up their own businesses, without necessarily having any clear idea of what these businesses might be.

As already noted couples were usually expected to work 8 hours/day (except during harvest time when they would be likely to work longer hours). They tended to have a couple of children but might have as many as six (they were usually not subject to the national one-child policy). Compared to many banana workers in other parts of the world (who sometimes report that they need to work 10 to 12 hour days in order to just survive), they appeared to be relatively well-off materially. In social terms however, their lives appeared to be somewhat restricted. A truck which left every week would allow them to visit the market to purchase their weekly supplies and no doubt this could offer them some diversion. However, they typically lived in isolated conditions with only a few other worker-couple neighbours, usually some distance away. Often their houses were remote from villages and although many were keen to get their children a good education there seemed to be some uncertainty in some areas as to whether their children were managing to get to school.

The rate of reward for worker-couples has risen fairly steadily in the last decade. In 2003 the price paid was 0.08 Yuan/Jin. By 2008 it had doubled to 0.16 while in 2012 it had reached 2 (or in some cases 2.2) Yuan/Jin.

1.6.2. Porters and Packers:

While the worker-couples appeared to be relatively happy with their lot, the same could not be said of the porters or the packers.

Both these functions were carried out by self-managing teams of men and women. These were normally made up of itinerant migrant workers who followed the harvest from county to county and from region to region. The teams would be known to the farmers and the latter would frequently help the teams to arrange future work with other farmers.
once they had finished harvesting on their own farms. Nevertheless teams had no guarantee of continuity of work and they had to find their own ways to move around between farms and regions.
In the case of porters, they felt that their pay was too low and the work was too hard. Payment was around 3 Yuan/yoke-load and this might involve carrying the bananas (suspended from yokes across their backs) over a distance of just a few metres to the packing point or as far as half a kilometre. It was very rare to see cableways and managers who had them on several occasions said that they didn’t think that they were very useful (given the cheap price of manual labour presumably and its flexibility in covering the terrain).

The porter gangs were organised in teams of around 13. Unfortunately it was not clear, in retrospect, whether each porter kept the payment for each delivery he or she made or whether (as in the case of the packing teams) payments were pooled across the whole team. Whichever was the case it is possible to calculate roughly an average daily wage from the payments per yoke-load. A gang should be able to fill a 30 tonne truck (carrying approximately 30,000 kilos) in a long day’s work. If an average yoke-load was 20 kilos then 1,500 loads would fill a truck. Very roughly this means that each porter would deliver a hundred loads per day, meaning that s/he might walk up to 50 kilometres in a 12 hour day and earn up to 300 Yuan/day.

This would mean that if a porter worked an average of 5 days per week for 50 weeks in a year, s/he might earn up to 75,000 Yuan (nearly as much as a worker-couple would earn in a good year.) However in practice porters had to move frequently, cutting down on time when they could work and they would be unlikely to find work continuously for 50 weeks.

Also it is questionable whether any one could keep up the rate of work necessary to earn this kind of money. Unfortunately (through an oversight) porters were not asked how much they expected to earn in a year and the calculation offered above is therefore somewhat speculative. (However it would appear to be in line with other labour costs in the region and with typical differentials between different roles in other parts of the banana world: harvesting is usually the best paid manual job in the banana industry; and costs for occasional agricultural manual labour at least in Hainan appeared to be around 200 Yuan/day).

The porters questioned were friendly and helpful but they were also unwilling to stop work for more than a moment. It was therefore also not possible to ascertain any details of their living conditions such as where they stayed, how they managed to feed themselves, etc. Only one large Type 1 operator in Guangxi actually reported having accommodation for the workers who helped with the harvest.

The packing teams varied in size but tended to be made up of around 20 people, again with a mixture of men and women. They worked typically from 7.00 am to 7 pm and were paid collectively around 1.1 Yuan/box. They aimed to fill a truck of 2750 boxes in a day. The money gained was divided equally between all the members of the team. 2750 boxes at 1.1 Yuan/box would give them a collective income of 3,025 Yuan/day. When divided by 20 this would give each packer just over 150 Yuan/day.
Availability of work depended on a demand which continuously fluctuated. A packing crew might work continuously for 12 hours per day for 6 days but then find itself without any work for variable periods of time.

Packers felt that the work they did was too hard, that they had to work too many hours in a working day and that the pay was poor.

When both porters and packers were asked why they did their respective work, they typically responded that they would be better paid in factories in the cities but that they came from the countryside and knew nothing of urban life. They saw themselves as having little choice other than to do relentless, not very well paid, insecure, hard agricultural work in order to make a fairly meagre living.

1.6.3. Peasant Farmers

Conditions for farmers varied considerably with some villages more favoured than others and with peasant farmers adopting different strategies for survival in different places. A number of peasant farmers were questioned briefly in a number of locations, such as temporary roadside packing stations, input supply shops and seedling-producing farms (where peasants would sometimes also provide temporary labour). However the best exchanges with peasant farmers occurred during visits to two villages, one in Hainan and one in Guangxi Autonomous Region.

Both villages were noted for their banana production but even so they were not exclusive producers of bananas. Farmers would turn to other crops if the banana market was judged to be insufficiently profitable and even when they stayed in bananas, they usually produced other crops in addition, either for the market or for family consumption or both.

The village of Nan Bao in Northern Hainan was unusual in that it had set up a banana cooperative. The village rented its excess lands to Hainan’s Chief Scientist who owned the successful San He Banana Company. Members of the cooperative were able to take advantage of technical advice from the Company as well as having their own advisors. Members set up training days, bought inputs together and cooperated over marketing.

As has already been noted, peasant farmers had much lower costs than other producers and villagers in Nan Bao calculated that on average a plant would cost 18 Yuan per year for preparation and all inputs. They expected to get yields of 30 – 40 Jin per plant. The amount of land down to bananas varied from farmer to farmer with some having as many as 20 mu and others as few as 3.5 mu.

In addition to bananas farmers raised pigs and chickens and also grew rice. They sold first season rice (which was considered to be of lower quality) and kept the second season rice for their own consumption.
Typically farmers in this village earned about 50 – 60,000 Yuan/family/year. Incomes could go as high as 120,000 Yuan but this was unusual. A typical family would comprise 2 parents, 2 grand-parents and 2 children.

The villagers recognised that they were particularly fortunate and reported that in neighbouring villages incomes of between 20 and 30,000 Yuan per year were more normal. If incomes fell below 30,000 Yuan, they maintained, it was not possible to have a decent life.

The village of Ning Lun, near the town of Jin Ling, is located some 75 Kilometres North-West of Nanning (the capital of Guangxi Autonomous Region).

Farmers here mostly grew bananas but they also kept chickens and grew their own vegetables. Some farmers had other enterprises, like fishing in the river (with nets) or growing seedlings. Some grew rubber and other cash crops. It was not usual to grow rice in this village.

The average holding was only 1.5 mu/person, which would work out as 9 mu for an average family of 6 people.

Farmers reported spending 15 Yuan/plant/year on agrochemicals and up to 25 Yuan/plant/year if preparation of the land and irrigation were factored in. They were able
to irrigate, using adjoining river water which they pumped out with electric, diesel or petrol engines.

With an average density of 120 plants/mu, returns could be from 4,800 to 9,600 Yuan per year. Farmers reported incomes of between 30 and 50,000 Yuan/year at a time when prices paid to farmers had been between 1.3 and 1.8 Yuan/Jin. They estimated that they needed 20 – 30,000 Yuan/year to survive but some wives insisted that a minimum of 30,000 was needed for life to be OK.

Overall the impression created by talking to farmers in both villages was that for most farmers life was not too bad but that most of them lived rather close to the edge of financial survival. Downturns in prices in a volatile banana market could represent a serious threat to their long-term economic prospects.

1.7. A brief Note on Trade Unions and Health and Safety

It was not within the remit of this particular mission to assess Health and Safety issues in the Chinese Banana Industry. Nevertheless, it would be a dereliction of duty not to make a few comments on these matters. There were three issues of immediate concern.

One porter was found to be in obvious pain. When he removed his shirt, it became clear that all the skin across his shoulders where the yoke rested had been worn away so that the yoke was resting on bare flesh. The porter was not able to stop work because he needed to earn money while the work was there and he also could not let his gang down. It was not possible to insist on inspecting the shoulders of all porters to see how many others were suffering in this way. Nevertheless anyone who has had a blister rubbing on his or her shoes when walking will appreciate that there is only one real solution to this kind of problem i.e. to stop the abrasion. Ignoring the problem only leads to more pain and can eventually lead to infected wounds which can even become life-threatening.

Porters did not appear to be satisfied with their lot. As long as a porter remained completely healthy, it was no doubt possible for him to tolerate his working conditions. However, as soon as something goes wrong, even starting with something as trivial as a small blister perhaps, his life could potentially become insupportable. There did not appear to be any kind of social or economic protection for people who performed this work task. If the yoke wore the skin off your back and shoulders and exposed the raw flesh, you simply had to keep on working.

A second and more general cause for concern was the absence of safety guards over drive belts attached to both mobile and static diesel and petrol generators and compressors. Such machines appeared in many locations and their drive belts were fully exposed in every case observed. There is clearly absolutely no problem with such unprotected belts as long as nothing goes wrong. However it only takes a moment’s inattention on the part of a tired worker, a stumble on uneven ground or a piece of loose clothing to be blown towards a drive belt by the wind for an accident to occur. Accidents like this can quite literally cause workers’ arms to be torn from their sockets.
The third cause for concern was the lack of protective equipment for worker-couples who spray fungicides and other chemicals. Of particular concern was the fact that workers relied on pieces of cloth tied across their mouths and noses to try to reduce the inhalation of sprays (after the fashion of a cowboy using his bandana to protect himself against inhalation of dust during a dust-storm). Clearly such cloths provide very little protection. Only a proper respirator is effective in preventing inhalation of chemical sprays.

It was also noted that when workers applied sprays to the leaves (using long hoses which were fed by mobile compressors), they walked forward between the rows of banana plants, spraying up into the leaves to their left and right as they progressed along the row. This meant that they walked straight into the mist which they had just sprayed. It would be preferable (though a little inconvenient) to walk backwards, so that the operator was always walking away from rather than directly into the spray. Even without the use of respirators, this would have gone some way to reducing the extent of exposure to chemicals.

There seemed to be a poor appreciation of the long-term dangers for workers of exposure to agrochemicals and indeed a not particularly strong sense of commitment to health and safety. It was somewhat disappointing to see that a Communist country (which one would expect to be particularly concerned about the welfare of its workers) apparently failed to ensure that workers were being protected from danger at work. As implied in the account above, the banana industry is run along fairly ruthless, capitalist lines, with entrepreneurs
potentially making and losing fortunes in what appears to be an unregulated market. In Western countries with a long history of such capitalism, trade unions have emerged as a separate force, with recognised legal rights, able to challenge employers when their behaviour is unacceptable or when unacceptable conditions are imposed upon the workers. Among the important roles of independent Trade Unions is that of ensuring the protection of workers’ health and safety by insisting that certain standards of work-place safety are adhered to.
Communist societies have tended to be ambivalent towards Trade Unions. Trade Unions have sometimes been important allies in the struggle to defeat capitalism and to establish communism. However in those cases where communist societies have been successfully established, trade unions have often been treated less than enthusiastically, once the revolution has been consolidated. Of course, it should be borne in mind that one of the architects of international communism, Vladimir Lenin, wrote scathingly about “trade union consciousness”. According to Lenin, the efforts of trade unions to improve workers’ conditions in the short-term, were essentially reprehensible because they would weaken the determination of workers and peasants to rise up and overthrow capitalism as a prelude to establishing communist society. Most communist countries and China appears to be no exception, ended up absorbing trade unions into the one-party state so that they offered little potential to oppose the interests of the managerial classes (who, in theory were acting for the benefit of the workers anyway, since theoretically class antagonisms no longer existed once communism had been achieved). In fact, in the case of China, Trade Unions were disbanded in 1966 but they were later re-established in 1973 but apparently with a new role as arms of management and the Party. The right to strike was contained in the constitution provided that strikes did not interfere with production.

In the case of China, since the reforms started by Deng Xiaoping (first announced by him in 1978 under the sobriquet of “The Four Modernisations”), more and more of the economy, including the banana sector, have become organised along capitalist principles. Productive enterprises can no longer realistically be seen as being organised for the benefit of workers; rather they are clearly aimed at maximising profits for owners and shareholders.

Without a tradition of independent trade unions which are prepared to challenge the interests of capitalist owners, there appears to be no-one who is in a position to or who has the right to help workers to protect their interests as regards wage levels, working conditions or health and safety.

Although requests were made to meet up with trade union leaders, trade unions appeared not to exist in this sector (clearly there is little room for trade unions when groups of workers or worker-couples are simply sub-contracted by employers rather than employed by them). The only exception is that there was a trade union in one of the plant breeding enterprises (in Guangxi province). This however played no part in negotiating wage levels or working conditions. Its main function appeared to be to organise several work’s outings or holidays in which workers were taken for 5 days to a week for a break to a beautiful location. The union organised these trips and negotiated money from the employer to pay for them.

II. Cooperation with the World Banana Forum

At the time of writing, the World Banana Forum’s main work is carried out through three Working Groups. Working Group 1 deals with Sustainable Production Systems and the
Environment. Working Group 2 deals with the Distribution of Value and other economic matters. Working Group 3 deals with workplace issues, including Health and Safety.

While in principle Chinese people involved in the industry or representing businesses or institutions would no doubt be welcome to participate in any area, there appears to be only one in which Chinese participation would be likely in the short term.

The absence of independent trade unions or even of active associations of small farmers make it unlikely that Chinese involvement in Working Group 3 would be feasible.

The economic instability of the Chinese industry and the fact that it is not well integrated into the international trading system make it unlikely that participation in Working Group 2 would be either attractive or fruitful at least in the short term.

The main area where participation appeared to be both potentially attractive to and also useful to Chinese players was that covered by Working Group 1. A number of people working in Tropical Agricultural Institutes (in Hainan and Guangxi) appeared interested in cooperation as did also a small number of executives of Type 1 operations. The issue of greatest concern and the area where cooperation was most desired concerned the spread of Fusarium Wilt.

As it happens, Gert Kema from Wageningen University is a member of Working Group 1 and is also setting up an international project which aims to investigate strategies for resisting the disease. Following a Working Group meeting in Amsterdam on June 20th, 2012 (at which Gert was unfortunately not present), it was suggested that the author of this report should contact Gert with a view to investigating synergies and establishing whether or not contact between the international group and Chinese researchers would be useful.

One question which remains of particular interest is that of how one of the Hainanese Chief Scientist’s plantations is able to resist infection in spite of being surrounded by infected plantations. Related to this is the question of whether or not high levels of organic fertilisers help resistance and if so, through what mechanism?

III. Adopting a New Paradigm

Towards the end of a Working Group 1 session at the Second International Meeting of the World Banana Forum (in Guayaquil, Ecuador in Feb 2012), there were several references to the need for a new paradigm in banana production. Although the idea was not elaborated in detail, it was clear that a new paradigm would involve treating the plantation as an agro-ecological entity, rather than following what might be called a traditional factory farm type model. Key to the approach would be the development of detailed knowledge of the interactions between all the key components of a plantation’s biological, economic and social ecology and the use of this knowledge to set up optimal conditions for production while limiting the need for much of the fairly crude chemical interventions which are currently standard practice in conventional production.
Broadly speaking, such a paradigm has been pursued for a number of years by the French research institute, CIRAD (and to some extent by others practising integrated pest management).

In private discussions between the author of this paper and CIRAD it was agreed that, if a suitable person could be found, a Chinese researcher might be invited to spend 6 months or a year in the French Antilles, getting a feel for the CIRAD approach and then adapting it to Chinese conditions when he or she returned home.

Someone was found who would be interested in working for a period at CIRAD. However it rapidly became clear that the idea was not financially feasible. CIRAD itself had made clear prior to the visit that it had no funds to cover an exchange of this nature and apparently funds for such exchanges are also very difficult and probably impossible to obtain in China, at least at present.