Food air freight, the global infrastructure expansion

Rose Bridger, 14th May 2008

The perishable air freight sector

All kinds of food and drink products, from wine and whisky to pet food and confectionery, are flown around on an occasional or even routine basis, although these ambient products are usually transported by ship, road and rail. Leaving this kind of shipment aside, most food that is air freighted is in the 'perishables' sector. This is a distinct segment of cargo that requires temperature control, often with a short shelf-life, and includes many kinds of products such as photographical equipment, chemicals and medicines. The majority of the air freight perishables sector, approximately 80 per cent by volume, is food and ornamental plants. This encompasses fruit and vegetables, along with flowers and other kinds of ornamental plants such as foliage, and garden plants including seedlings and bedding plants. Fish, mainly edible but also ornamental, is a fast growing perishable air cargo sector globally. Some meat is air freighted, although predominantly to destinations such as the Middle East rather than the UK. Along with fresh produce, the perishable air freight sector includes prepared chilled products such as fruit salads and prepared vegetables and fish, and these 'value-added' products are highlighted as particular growth areas in many industry reports.

Perishable goods is one of the largest air cargo sectors, with industry body the Cool Chain Association estimating that this sector accounts for 14 per cent by volume of total global air freight.[1] Aviation industry reports in 2005 highlighted perishables as one of the fastest growing air cargo sectors at about 10 per cent per year, expecting volumes to amount to approximately 10 million tonnes per year by 2010.[2] Perishables is an important sector for the UK's flag carrier, British Airways World Cargo (BAWC), accounting for about 20 per cent of volumes in 2005.[3] In 2007, BAWC estimated 8 per cent growth in global tonnage over the next five years.[4] Some carriers' growth estimates for perishables are higher, for example in November 2005 the Luxembourg based carrier Cargolux estimated an increase of 20 per cent per annum.[5]

Global infrastructure expansion

Food air freight is certainly a hot topic, but the media has fixated on the suggestion that retailers might reduce the amount of air freighted produce they source, and the effects of this eventuality on the export earnings of poorer countries. This seems to be a distraction from the reality that air freight export of food and flowers from many low income countries such as Kenya, Ethiopia and India is growing and the carriers, logistics firms and exporting regions involved project that this growth will continue. Tesco and Marks & Spencer reported an increase of 10 per cent in sales of Kenyan produce in the UK 2007.[6] In May 2008, Asda announced that it would be sourcing an additional £30 million worth of fresh produce from African farmers over the next five years.[7] With current export infrastructure development trends, a considerable proportion of this produce is likely to be transported by plane. Air freighted exports from many middle income countries, including Trinidad & Tobago, Thailand, Guatemala, Vietnam, Ecuador and Colombia, are also increasing. The UK is a key target market for some of these countries, for example, in September 2007, 60 per cent of shelf-ready products fair freighted from Thailand to Europe were sold in UK supermarkets.[8] UK air freighted imports from wealthy countries include fish from Iceland and Canada.

While the press reports the minutiae of baggage mishaps at Heathrow's new terminal and generally perpetuates the assumption that aviation expansion is all about people going on holiday, and galvanising the global economy with business trips, air cargo is actually growing faster than passenger flights. Boeing's 2007 predictions are for approximate growth of 6.2 per cent per annum over the next 20 years, resulting in a tripling of RTK's (Revenue Tonne Kilometres) by 2026.[9] In a February 2008 announcement Boeing notes that air freight has been growing at seven per cent per year since 1970, faster than passenger flight growth of five per cent over the same period, and anticipates air cargo growth to continue to outpace passenger growth in every world market until 2025.[10] Perishable air freight infrastructure is widespread and prominent in airport expansion globally, with export facilities operational, in development and expanding in a great many countries. This includes some of the poorest countries, for example recently operational in Rwanda and imminent in Cameroon and Mali. Nigeria is one of many countries likely to increase its presence in the air freight perishable sector, with fast track construction of cargo airports with perishable exports central to the development plans looking imminent in many states including Zamfara.

Concurrent with the export infrastructure expansion predominantly in poorer countries, there is recently operational and ongoing import capacity expansion predominantly in Europe, the US and the Middle East. Import terminals for perishable produce from Thailand, Egypt and Vietnam are in development in mainland Europe. Transhipment operations and expansion is predominantly in wealthier countries but also in some low income countries such as Sri Lanka and Egypt. Perishable produce accounts for approximately 80 per cent of air freighted exports from some African and South American countries.[11] Exports are also increasing from wealthy northern countries, such as Scandinavian fish and fruit and vegetables from the US and Australia.

Airport development plans

When looking at drivers and trends in the perishables sector, the airport development plans are a good place to start. In contrast to abstract economic theories, development plans are crystal clear regarding the planned capacity, trade flows, types of produce and products, complete with import, export and trans-shipment targets. Through my investigation and analysis of aviation expansion I am already aware of perishables infrastructure development at hundreds of airports in about 100 countries. This includes many cargo oriented and cargo only airports in poor countries with the key purpose of perishable produce exports. While there are uncertainties about the long term viability of the facilities, they are the result of considerable financing, resource allocation and political will, so will likely be operational at least in the short term. It is important to get a complete picture of financing and investment for the infrastructure, which affects the ownership and control of the facilities. The diversity and scale of investment from international agencies, foreign aid, foreign direct investment from many firms and alliances of firms and governments, along with the prominence of perishables handling facilities in aviation expansion globally, indicates its strategic importance in many countries' planned development path and the future of global trade.

I have found no detailed analysis of current capacity or looking forward at infrastructure development or its implications from academia, international or government agencies or non-governmental organisations. The World Bank's analysis of air freight in 2006, initiated after its renewed focus on the sector and supporting airport infrastructure development in many countries, relies on industry reports from firms such as such as Boeing, Airbus, Lufthansa Consulting and trade organisations like Airports Council International, Air Transport Action Group (ATAG), the International Civil Aviation Organization (ICAO) and The International Air Cargo Association (TIACA). The World Bank's belated analysis notes incomplete data on routes and values of goods shipped.[12]

In the UK there is little public awareness of perishables infrastructure expansion. Broadly, this appears to be the case elsewhere. Beyond communities' lack of knowledge about what is happening nearby, there is an incomplete picture of global expansion of infrastructure for food and flowers air freight, and its likely impacts and consequences. The high profile debate in the UK has revolved around small scale studies making retrospective impact calculations of established supply chains.

UK imports and exports

Following an initial estimate of 31.6 per cent, Defra's revised statistics for Food Transport Indicators to 2006 estimate an 11 per cent rise in air food kilometres (a measurement combining distance with volume) into the UK in 2006 compared to the previous year. The increase amounts to 24,000 tonnes. The report estimates that although air freight amounts to 1 per cent of imports, the CO_2 emissions equal that of the 99 per cent of the imports that are shipped, with both emitting 13 per cent of the total CO_2 emissions of food transport to UK consumers.[13] Outside the trade press, development of the requisite infrastructure and rising cargo volumes at airports is rarely reported. Heathrow is a key airport for perishable imports along with transhipment. BAWC's Heathrow facility handled 115,000 tonnes in 2006, and further expansion includes the recent opening of facilities for 'animal products for non-human consumption'. Other carriers importing perishables to Heathrow include Virgin. Perishable imports are also flown into Gatwick and Stansted, with BAWC trucking produce to their Heathrow facility for national distribution. Kent Airport handled 20,841 tonnes of perishables in 2006.[14] The logistics company Pangaean opened a perishables handling facility at Manchester Airport in March 2007, starting with 6-7,000 tonnes in its first year, and aiming to increase volumes to approximately 18,000 tonnes by 2010.[15]

Humberside Airport is developing as a major gateway for fish, with imports in freighters from Iceland increasing, along with development of facilities for export of processed perishable products from Humberside. Grimsby Council is developing trade relations with Iceland for an assured supply of fish to Humberside Airport for processors based in Grimsby, and development of fish air freight export facilities from Iceland's Akureyri Airport has been fast tracked.[16] The trade deal is partly in response to reduced catch quotas to preserve fish stocks. It would be ironic if protecting fish stocks combines with the commercial pressures driving food air freight expansion, with supposed 'trade-offs' emerging between different environmental aspects of the supply chain in parallel to the tensions between those advocating food air freight on development grounds and those who are more concerned about the negative environmental impacts. There are indications of this, for example seafood company Pescafresca speculating that reduction in hake quotas in Spanish waters combined with continued demand for the fish will lead to a growth in air freighted supplies.[17]

In South Yorkshire, imports to Robin Hood Airport include flowers from Florida, while exports include lobsters flown out to Spain, with British tourists among those eating the lobsters whilst on their Spanish holidays. Food and flowers are also air freighted to and from many more of the 68 UK airports registered for freight, such as exports of seafood products and large shipments of whisky from Glasgow Prestwick. The supply chain is often multimodal incorporating road, rail and shipping, and some of the food and flowers which lands in mainland Europe is then trucked and shipped to the UK. Public information from airports and carriers on cargo types, volumes and routes is minimal, but there are reports that some produce, for example from India, is flown to London then distributed around Europe. Capacity expansion at UK airports appears to be minor compared to that which is recently operational and imminent at many airports in mainland Europe, such as in France, Germany and the Netherlands.

Airport aligned agricultural export zones

In many countries such as Gambia, South Africa, Tanzania, Sri Lanka and India there are designated produce export zones operational and in development, adjacent to the airport or connected via dedicated trade corridors. I call these 'airport aligned agricultural export zones' as they are effectively part of the airport complex in terms of infrastructure provision and regulation. Many airport developments are part of a multimodal logistics complex integrating shipping, road and sometimes also rail links. Fish, wild and farmed, can also be incorporated in airport associated development, for example India's Marine Products Export Development Authority has set a target of $6 billion of exports of edible and ornamental fish by 2015 and is considering the establishment of aquacultural technology parks near international airports.[18] While there is competition between modes of transport, overall they are all growing simultaneously and expansion plans incorporate this. For example, several Indian coastal airports, including Chennai, are expanding export logistics capacity for tuna frozen exports by ship, with air freight charters for premium sashimi. The resource hungry transportation and chill-chain infrastructure extends into the airport hinterland, and along with the land allocation, a great deal of resources such as power and water are funnelled into these developments.

This amounts to widespread expansion and extension of 'free/foreign trade zones' to include agricultural products in these multimodal but airport centric developments. The hard infrastructure of construction, transportation and refrigeration is supported by the soft infrastructure of policy including planning, subsidies, incentives and regulation facilitating the export supply chain. Along with tax free aviation fuel, making air freight disproportionately cheap compared to less energy intensive forms of transport, direct subsidies for air freighted perishable produce exports are widespread. For example, in India, Bagdogra, Kolkata and Guwahati Airports are among those designated as export hubs, and in 2006 the Indian government announced 'assistance' of 50 per cent, or even 90 per cent, of internal air freight costs for certain types of perishable produce from the North Eastern states for export from Mumbai or Delhi.[19] Monthly figures for perishable exports from Delhi Airport have risen dramatically, more than doubling from 840 tonnes in Jan 2007 to 1714 tonnes in Jan 2008.[20]

Extending the chill-chain

The airport perishables handling facilities are just one segment of the supply chain infrastructure that is required for the produce to reach the refrigerated aisles in UK stores. A complex and convoluted chill-chain of refrigeration extends around the globe. Agricultural produce might be grown in the sun, but the chill-chain entails a multitude of stages which might include post harvest blast chilling, on-farm chilled storage, a refrigerated truck to the airport perishable centre, refrigeration on the runway. The produce is temperature controlled on the plane, or planes as there could be two or more interconnecting flights with transhipment occurring at many airports including Schipol in the Netherlands, Frankfurt, Dubai, Addis Ababa in Ethiopia, Reykjavik in Iceland and islands including Aruba, Jamaica and Colombo Airport in Sri Lanka.

The full extent of convoluted supply chains which might include domestic flights to an export hub, interconnecting flights and multimodal journeys criss-crossing the globe are not encompassed by Defra's Food Transport Indicators methodology as it is assumed that the country of origin is the country of despatch, and the distance that is flown is calculated as the straight line between London and the main city of the country of origin.[21] UK supermarkets' labelling of air freighted produce has been applied to single ingredient food products and cut flowers, but fruit salads and prepared mixed vegetables are a growth area, and products labelled 'produce of various countries' could involve multiple connecting journeys. For example, in August

2007 BAWC reported that mangoes were being shipped from India to South Africa for inclusion in prepared fruit salads which are then air freighted to the UK for supply to supermarkets, in particular Sainsbury's and Marks & Spencer.[22]

After landing the produce goes to another airport perishable centre, then into refrigerated trucks to consolidation and distribution centres from where it is trucked to the stores. In the industry this chill-chain is often referred to as a 'weather-proof pipeline', but ironically it is highly fossil fuel dependent and a contributor to greenhouse gas emissions and climate chaos; furthermore many of the refrigerants are potent greenhouse gases. From the store the produce finally reaches the home fridge or freezer.

We hear a lot about the high quantities of food that the end customer throws away uneaten. In the UK, WRAP (Waste & Resources Action Programme) estimates that 6.7 million tonnes of food is thrown out by UK homes annually, with 40 per cent of this consisting of fresh fruit and vegetables.[23] There is little reporting of pre-consumer wastage rates in the supply chain, which in the case of air freighted perishable produce are estimated globally by many firms and industry bodies to be about 30 per cent.[24] Emirates SkyCargo, a carrier with recent new routes including passenger flights with perishables in the bellyhold to Newcastle Airport, estimates the industry's wastage rates of perishable fruit and vegetables at 30-35 per cent.[25] Some reports of pre-consumer waste of perishable produce are much higher. For example in 2006 in Pakistan, the Multan Chamber of Commerce and Industry, in calling for upgrade of Multan Airport to accommodate wide bodied aircraft and a 50 per cent air freight subsidy to promote export of fresh fruits, stated that 70 per cent of perishable produce was going to waste.[26] Pre-consumer wastage can occur at many points from post-harvest onwards. Often, wastage is not disaggregated into different modes of transport in industry reports, and road and shipping also need to address the issue.

What's in the returning freighters?

Carriers aim to maximise revenues with a full payload on each journey, and incoming flights to the perishable exporting areas in 'developing' countries in particular, often include industrial, manufacturing and telecommunications equipment and finished consumer goods for the minority that can afford them. The physical and regulatory infrastructure of the airport aligned export zone also enables the import of inputs for the export supply chain. So analysis of the airborne food chain can often necessitate looking back further than the farm. While carrying cargo including perishable produce in the bellyhold of passenger flights is growing, there is a shift towards more use of dedicated freighters, with many models having a capacity of over 100 tonnes. Dedicated freighters account for a growing share of capacity and traffic for air cargo generally and this trend is expected to continue.[27] In 2006, a World Bank Diagnostic Trade Integration Study noted that in the case of Kenya, the growth of perishable air freight export has led to the situation that return freighter flights from Europe are often almost empty.[28] The Uganda study noted that triangular routing takes planes to the Far East and Johannesburg after delivering perishables to Europe, with empty planes then returning to Entebbe from Nairobi and Johannesburg.[29] Since November 2007, Icelandair freighters have been flying empty from Reykjavik to Newfoundland to pick up seafood destined for Europe.[30] The aviation trade press is full of reports of empty and less than full freighters, including routing that incorporates perishable produce. Trade surpluses and deficits are often reflected in the air cargo sector, with empty and under filled freighters flying around on a routine basis.

Air imports into the perishable exporting airports can include inputs for the perishable export supply chain. Many airports have a Border Inspection Post, providing physical and regulatory infrastructure for the import of what can amount to the full complement of farming inputs such as agrochemicals, tissue cultures and seeds. Animal feed, veterinary products and livestock can be flown in. A return flight that is empty or supplying farming inputs is an integral part of the export supply chain, reasonably placed within the system boundary, and should be factored into environmental impact calculations. Equipment for farming, refrigeration and greenhouses can be flown in. Agricultural equipment is a major export sector from some key perishable produce importing airports such as Miami in the US. The area under plastic greenhouses for export crops in countries such India, Kenya, Ethiopia and Colombia is growing rapidly. While this is not the level of climate control of greenhouse production in northern latitudes, it shows how the exports can be input intensive with extension of the growing season, geared to the preferences of wealthy markets and buyers' specifications, and not necessarily making optimal use of local conditions.

Power relations in the supply chain

The developments raise many concerns regarding the power balance of these global supply chains. There is a high level of market concentration in air freight in many countries and regions. The carriers' story of cut throat competition is not the complete picture. Flag carriers, effectively state corporations frequently benefiting from preferential provision of infrastructure and subsidies, often have a major market share, such as Ethiopian Airlines, EgyptAir Cargo, SriLankan Cargo and many of the Gulf carriers such Emirates SkyCargo of Dubai, which is established as a major conduit for air freight trade flows between Africa, Asia and Europe. Icelandair has a virtual monopoly on flights of fish including into Humberside. Bottlenecks of power with market concentration at the agricultural input and retailer ends of the supply chain are analysed, and the ever expanding logistics and vertically integrated supply chains in between producer and consumer require similar attention. The export supply chain raises concerns of capital, technological and regulatory barriers to trade. Participation in the perishable air freight supply chain requires a lot of expensive technology with a relentless upgrade path and an ever raising regulatory bar to supplying wealthy markets. Opening up long distance, centralised supply chains can raise market access barriers to smaller firms and alternative trade routes. The contractual arrangements of the infrastructure development affect the power balance in the supply chains, for example with bilateral trade agreements the exporting region could be under pressure to feed the technologically complex export infrastructure with primary resources.

There are many uncertainties around whether the export developments will bring long term, stable markets with a fair slice of the profits, for exporting regions. While there is a shift of value-adding activity with fruit, vegetables, flower and fish, to exporting regions, this is often with imported technology and inputs so raises the question of the opportunities for broad based, diverse economic development. Instead of climbing the value-chain, exporting regions could effectively be at the bottom of the food chain providing cheap resources and labour with economic benefits accrued mainly by a narrow segment of the local population and foreign investors. Adding value in exporting countries also appears to deepen the supposed environment versus development trade offs, as the prepared produce has a shorter shelf-life which can necessitate air freight to reach the stores more quickly.

Export competition

Along with the economic uncertainties that may affect long term viability, there is the physical infrastructure requirement that export capacity requires matching import facilities. If there is export overcapacity the exporting countries will be at a disadvantage. Newer facilities include Addis Ababa Airport in Ethiopia, where a new perishable export and transhipment terminal opened in 2006. Flowers are the main perishable export, but fruit and vegetable exports are also increasing. In November 2007 the first flight of strawberries grown in Ethiopia landed in the Netherlands.[31] Fertile land around the airport has been designated for food and flower exports, where there are the biggest foreign direct investments in the country's history. Subsidies and incentives include up to 750 hectares free land for investors, five year tax breaks and loans. Water is free and wages are competitive at about 80 cents to $1 per day for flower picking.

There have already been instances of flower farms relocating from Uganda to Ethiopia because of lower production costs, leading to the Uganda Flower Exporters Association calling for similar incentives including a ten year tax break and subsidised air freight.[32] Lowering production costs is a pressing concern for some exporting areas. There are indications of a 'race to the bottom' in lowering production costs with firms chasing comparative advantage in the form of incentives. The Ethiopian Horticulture Producers and Export Association (EHPEA) reported that Ethiopia's perishable export earning increased fivefold to $100 million in just two years from 2005 – 2007.[33] The EHPEA aims to increase this to $1.4 billion within five years.[34] To help meet this target, cold storage is in development at Bahir Dar Airport, and 700 hectares of land is available free for investors for development of fruit and vegetable exports.[35]

What's happening on the ground?

Discussion of the trade and development gains for the exporting region tends to focus on the conditions for those working in the supply chain in particular on farms. While this is important, the voices of the wider community, including those not employed, some of whom may queue at the farm gates looking for work, or have been displaced for the development, need to be heard. When listening to the business community, we need to listen to voices wider than the horticulture export boards which frequently call for more subsidies and incentives, more and bigger airport perishable centres and direct flights to key importing and transhipment airports in Europe, the US and the Middle East. The actual and projected export earnings are considerable, but we need to ask where the money goes, if it filters down to the poorest of the poor, and listen to those who raise concerns of revenue losses due to subsidies.

In addition to the overall global picture, we need to know more about what is happening on the ground at and around the development sites. The infrastructure develops fast and exports escalate in many countries regardless of oppressive regimes, political and economic instability, conflict and unreliable weather conditions reducing agricultural yields. All of these contribute to a worsening food security situation and stubbornly high levels of poverty, malnutrition and hunger. Exports are growing from countries which have experienced economic growth without a proportional improvement in poorer people's nutritional status, such as India and Guatemala. Ethiopia's exports escalate, with state carrier Ethiopian Airlines leasing two additional freighters for perishable exports in December 2007.[36] Simultaneously, other areas of the country suffered reduced agricultural yields due to drought and floods and in 2007 1.36 million people were in need of emergency food aid.[37] Air freighted perishable produce exports continue and grow from many of the countries where food riots are now occurring. In these countries, poor people, who in many instances have been less and less able to afford nutritious fresh produce, have recently seen the prices of the staple grains they have fallen back on rise dramatically.

Exports from Kenya continued more reliably than tourist flights during the recent conflict triggered by a disputed election, supported by the deployment of armed guard for key trade corridors. The exports have not just continued from established facilities at Nairobi and Mombasa Airports. Eldoret, in the Rift Valley was badly affected by the recent conflict triggered by the disputed election and in February 2008 a new 150 tonne cooler at Eldoret Airport saw its first flight of flowers to Europe. [38] Sri Lanka's perishable exports rose 34 per cent in the first three months of 2007 compared to the same period in the previous year.[39] This increase occurred in spite of plummeting tourist flights, political unrest and violence that was often directed at Colombo Airport. Khartoum, Sudan's capital city, has long been largely insulated from one of the world's worst humanitarian crises in the Darfur region, and air freighted perishable produce exports have been reported from Khartoum Airport, including shipments by Emirates SkyCargo reported in Payload Asia magazine as recently as May 2008.[40]

Perishable export development can be a focus for unrest, such as Pakistan's first Agro Export Processing Zone in Sindh, which has been suspended due to occupation of the land, though development is expected to resume pending completion of the boundary wall.[41] In many parts of India there is tumultuous protest over land allocation for Special Economic Zones.[42] Alongside manufacturing, these zones frequently include an Agricultural Export Zone and cargo airport development.

Food air freight and peak oil – a reality check

In debate around food and flowers air freight, and aviation generally, there is frequently an assumption that rising oil prices will curtail the industry. While this may ultimately be the case, as for much of global trade, without a viable alternative to fossil fuels, the rise of the perishables sector, and the construction programme which intensified in 2003 and is still underway, has been concurrent with rising oil prices and more or less universal expectations of an ongoing upward oil price trajectory. Along with subsidies for air freight costs, export zones also often benefit from low energy costs. Even if there are higher transport costs, there is every indication that, for an uncertain time frame, these could be more than offset by low production costs combined with high margins in supplying wealthy markets.

There are also indications of a symbiotic relationship between air freight of perishable produce and the oil and gas industry. Dedicated freighters are also suitable for heavyweight and outsize cargo, which is another fast growing air freight sector. In 2006, specialist heavyweight carrier Volga-Dnepr estimated that the heavyweight sector had grown about 28 per cent annually for the previous four years, and forecast continuing growth of 15-20 per cent until 2010.[43] Within the heavyweight sector, equipment for the oil and gas industry is growing. Many perishable importing and transhipment airports are also exporters of oil and gas equipment, such as Houston in the US, which doubled its perishable import capacity in 2006, and Vatry in France which attributes its 13 per cent rise in cargo throughput in 2007 largely to perishable traffic. Many carriers are heavily involved in both the perishable and oil and gas sectors, including Volga-Dnepr, Cargolux, BAWC, UK based Coyne Airways, Icelandair and several Gulf based carriers such as Etihad.

Development for oil export is intensifying in many countries with increasing perishable air freight exports, such as Sri Lanka, Ecuador and many African countries such as Ethiopia, Cameroon, Uganda and Tanzania. Heavyweight cargo into perishable exporting areas includes industrial equipment such as for mining and manufacturing, along with telecoms. This is fast tracking adoption of fossil fuel dependent industrialisation and feeding resources into globalised supply chains. This could preclude alternative models of development, and risks hardwiring poorer countries status as exporting resources, with wealthy countries as consumption centres increasing their dependency on these imports. Many freighters into some of the perishable exporting regions are laden with equipment for oil and gas exploration and extraction. In 2006, all-cargo airline Cargolux reported that its growth in imports to Nigeria, Chad and Congo is fuelled by oil and gas equipment, with return flights to the US filled with perishables.[44] The combination of perishable produce and support for the oil and gas industry is central to the development plans of many airports in wealthier countries, such as Humberside in the UK, and Gander Airport in Canada which highlights heavyweight oil and gas equipment in its cargo growth strategy in addition to seafood exports.[45]

Limited oil reserves and rising oil prices have led to an expansion of exploration and production. Fossil fuel supply is of such importance to business models imbued with short-termism that there is a willingness to burn up aviation fuel in order to secure supplies of what is left as quickly as possible. Writing in Air Cargo World in April 2008, Phillip Hastings states that 'One feature of the global outsize cargo business upon which they are agreed is the continuing major boost to those activities from strong world oil and gas prices'.[46] Trade press reports indicate that the perishable produce air freight sector is complementary with development of an oil based economy. Air freight dependent supply chain management practices supplying wealthy markets with 'fresh' and 'natural' food produce and bringing nature into our homes with ornamentals plants is not just dependent on oil. It is an integral part of a wider system that is facilitating oil exports from poorer countries and further hardwiring dependence on fossil fuels for global trade to provide wealthy consumption centres' with some of their most basic needs and fleeting enjoyments.

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