Japanese Forests

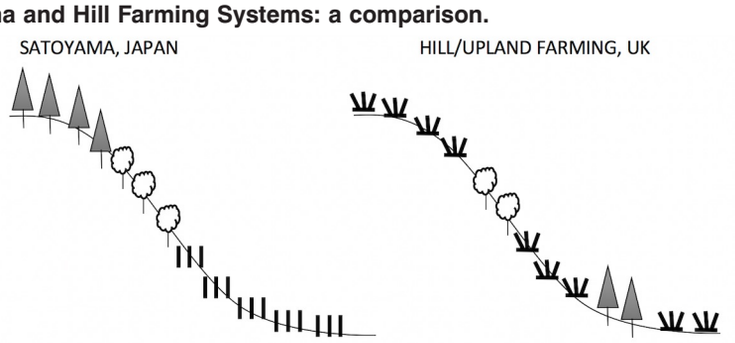
Diversification in a traditional place-based system

Lois Mansfield explores the Japanese approach to farm woodland and suggests some ways that it could be applied to the management of UK upland farm woods.

Japanese rural economic development officers from Yoshino, Tanabe and Minabe on the Kii Peninsula of south central Japan, are exploring ways to re-invigorate the commercial potential of their forests, due to continued declining market demand for timber. These forests form part of the traditional Japanese *satoyama* upland management system and consequently are linked to broader economic development for struggling rural communities.

The approaches they are developing offer insight for UK upland farming businesses where farm woodland has fallen out of management for a number of reasons. With the re-alignment of UK government policy to favour public goods provision, the value of upland farm woods needs to be re-evaluated. Experience from Japan shows that diversification into house building, charcoal-based foodstuffs, giftware and other culturally valued products provides opportunity as part of our economic development planning in uplands.

Figure 1. Satoyama and Hill Farming Systems: a comparison.



		Satoyama	Hill-upland Farming
Upper	Land use	Extensive forestry	Extensive grazing/ grouse moor
	Resource property rights	Communal by community and private ownership Community water management	Common rights with landlord (most) Sole grazing Private ownership
Middle	Land use	Agriculture (e.g. orchards) Forestry	Agriculture (semi-intensive grazing) Forestry
	Resources property rights	Private and community owned Community water management	Privately owned
Lower	Land use	Agriculture (e.g. rice) Forestry	Agriculture (intensive grazing)
	Resource property rights	Private ownership fields Community water management	Private ownership fields

Satoyama and forests in upland Japan

Whilst there is some controversy about the exact character of satoyama, it is essentially a traditional upland rural landscape constituting varying combinations of communal and private forests, and agricultural land depending on your geographical location in Japan (Indrawan et al., 2014). Thus, the satoyama of the Kii Peninsula is dominated by forests on the higher slopes succeeded by orchards, vegetables and rice lower downhill (Figure 1). In contrast, northern areas of Japan (Hokkaido) grasslands are typical of the higher reaches, more similar to agro-pastoral systems in the United Kingdom. Both are examples of a socio-ecological system where environmental determinism has influenced

Dominant tree species in Japan. Left: Japanese red cedar (Cryptomeria japonica). Right: Japanese cypress (Chamaecyparis obtusa). Both specimens are around 200 years old.

human productive activity creating a range of ecological communities symbiotically (Takeuchi et al., 2016; Mansfield, 2011). The system is interconnected through the reliance on water management (quantity and quality); the forest areas act as collection zones to provide water for downslope activities. The system itself has evolved over hundreds of years, often through people negotiating land management between each other for benefit of the wider community. Recently, there has been renewed interest in satoyama by the Japanese government as a way to slow rural depopulation and enhance economic development (*Japanese Times*, 08/07/19).

Forest in rural Japan is important, not only due to its role as part of the tradition of satoyama, but also because around 67% of the nation is covered by it in comparison to 14% classified as agricultural land (MAFF-J, 2018). There are five main types of forest system, all of which can form part of satoyama:

- Natural primeval forest generally related to religious shrines avoiding complete exploitation.
- Native forest in extremely inaccessible locations or pockets left untouched.
- Historic plantations dating back to the beginnings of the Edo period (1600 to 1869), dominated by Japanese red cedar (*Cryptomeria japonica*) and Japanese cypress (*Chamaecyparis obtusa*). These are the forests around Yoshino with a related reasonably rich biodiversity.
- Post-1945 plantation developed on the back of the success of the historic plantations of Yoshino employing the same species. After Second World War disafforestation, almost all of Japan was re-afforested in this way for national timber production and land stabilisation in a country where tectonic activity and landslides are common. They have a poor biodiversity.
- Coppice woodland dominated by a particular species of Japanese oak (ubamegashi oak; *Quercus phillyraeoides*), which grows in the uplands around Minabe and Tanabe.

Forest management in Japan and the Kii Peninsula

Whilst forests can be owned by national agencies (29%), public and private forestry corporations exist (24%) along with private family and community ownership (54%) (MAFF-J, 2018). Most of the private forests are managed by private contractors on behalf of the owners, as is the case around Minabe and Tanabe on the Kii Peninsula. In Yoshino a more traditional form of management is employed that dates back to the Edo period. The yamamori, who are highly skilled forest managers (the name translates as 'Guardians of the Forest'), manage the 400 year-old forests in a sustainable way. The yamamori selectively fell individual trees and do not clear fell, to allow the forest to regenerate, retain landscape stability and limit soil erosion, which would impact water quality for agricultural production and domestic supply. This careful management is reflected in the weekly Yoshino timber markets that sell individual trees rather than lots.

At a national level a range of forestry legislation exists covering general management (Third Forest Act 1965), the multifunctional role of forests (Forest & Forestry Basic Act 2001) and governance structures (e.g. Forest Owners Cooperative Association Act, 1978 plus amendments). For example, the Third Forest Act 1965's main aim is "the sustainable growth of the forests and the improvement of forest productivity in order to contribute to the conservation of national land and the development of national economy" (FAO, 2010). Whilst this sounds progressive, the

The Timber Market in Yoshino, Nara Prefecture.

relationship between Japanese forestry and biodiversity conservation is similar to that of the UK between agriculture and the latter. Consequently, environmental issues are focused more on commercial forest harvesting systems, in terms of poor felling practice and unsustainable harvesting.

Since 1945 there has been a steady decline in the domestic demand for the timber from Japanese forests (Figure 2) and a steady increase in the use of cheaper imports from the developing markets from S.E. Asia and China. Whilst the price of timber has stayed the same, it is inflation that has caused the problem. Second, there has been a substantial move away from traditional timber-based houses to those built from cement and plastic. Furthermore, shifts in cultural attitudes desiring contemporary housing has led to traditional property being acquired, the current house knocked down and a new house built on original footprint, but not using timber. These trends are aggravated by widespread rural depopulation (by 82%), land abandonment (69%), and a collapse in rural labour availability (71%) since 1945 (MAFF-J, 2019). In addition, in Yoshino the forestry industry is the main employer (tourism is second) and thus any destabilising force has severe economic consequences for the local area.

Addressing the challenge

As timber demand has declined, development officers in Yoshino, Minabe and Tanabe have been recruited specifically to revitalise the industry through diversification of products and better marketing. The central tenet is to work collaboratively with forest managers, sawmill owners and timber processors to identify new products and new markets. This is an important cultural aspect of Japanese society, to work collaboratively.

In Yoshino a range of alternative income streams have been developed:

- Building an Air BnB from local timber – used for visitors interested in learning about sustainable forestry around Yoshino. It also provides a new avenue for timber diversification as well as generating income for the project.

- Sake barrel manufacture – a return to wooden barrels from glass lined metal as this provides subtlety of flavour rather than lack of character and distinctiveness, commanding higher price.

- Chopstick production from waste – using the wood from around the structural timber taken from the four segments (cut off by the chords). The Japanese chopstick industry is being undermined by cheap imports from China (the classic issue of 'buy your own country's product first').

- Making school desks – secondary school children make their own wooden desks on entry and take the desk with them as they go from one year to the next, then have it as a graduation present. Whilst they build them the related curriculum looks at forest ecology, sustainable timber production and the tradition of yamamori to reconnect children with their cultural heritage.

- Cedar oil products – essential oil and insect repellent to sell in tourist outlets across the Kii Peninsula.

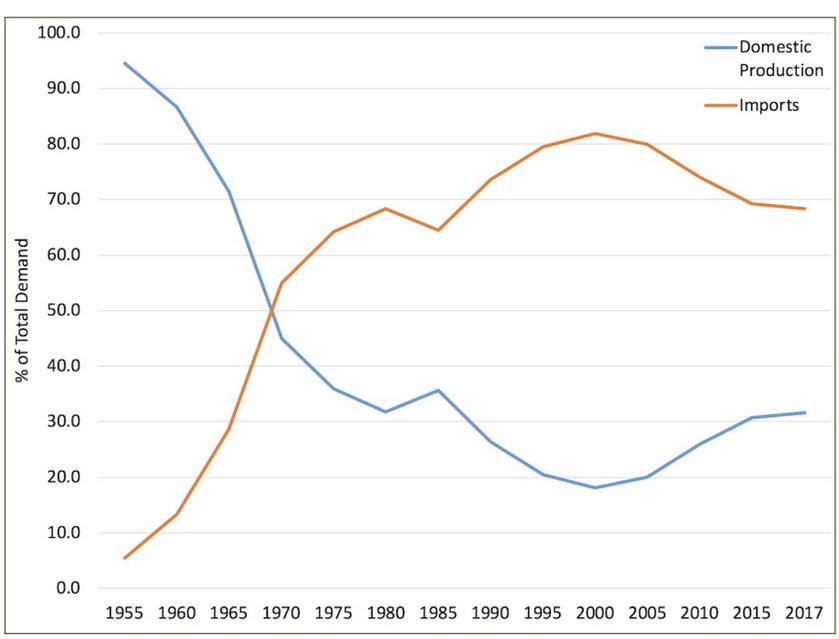


Figure 2. Trends in Japanese Domestic Production & Imports of Timber 1955 to 2017 (Source: Forestry Agency, MAFF, Japan (2018).

In the Minabe-Tanabe area their approach has been different. Here they have focused on adding value and better marketing for the specialised charcoal produced from the coppiced ubamegashi wood, which is one of the most sought after – *Bincyotan* (Pron. *Binchotan*). This is a very dense metallic like product of 99% purity and is a speciality of traditional charcoal burners around Minabe. The charcoal is used in many ways, specifically fuel for various types of

Timber products, Yoshino, Nara Prefecture.

yakatori (skewered meats) cooking and eel broiling. The charcoal cooks the food without the characteristic external burning of many less dense forms. It is also used for water purification, dehumidifiers in rooms and as a soil improver.

This traditional charcoal product is supported by the Japanese Government recognising its value, whereby in 1974, it was officially designated as an intangible cultural asset and, latterly in 2015, the coppice woods and technique were included as a fundamental component of the Minabe-Tanabe GIAHS (Globally Important Agricultural Heritage System) international designation (FAO, 2007). This concept is designed to conserve and sustainably manage traditional 'agricultural' systems (of which satoyama and its agroforestry is considered one) which are under threat from agricultural industrialisation and intensification. The main thrust is to work with land managers to demonstrate the ecological, economic and social benefits of maintaining ancient practices by recognising the interrelationship between people and place (MAFF-J, 2019).

The other strand of the GIAHS programme for the Bincyotan charcoal is to increase its use in cooking. Due to its purity, the charcoal is ground into a fine powder, like flour, and used as an ingredient in foodstuffs. Products include biscuits, ice cream, pizza dough and mochi (a traditional rice dough). Contrary to logic, the foodstuffs do not taste gritty, and in fact, there are now black charcoal soba noodles for sale in UK restaurant chains and charcoal-laced cheese made in southern Scotland.

Lessons for woodlands on UK upland & hill farms

Historically, woodland on hill farms was part of the integrated system of resource use (Winchester, 2000). These farmers used all the assets at their disposal mainly on a subsistence level, e.g. peat for fuel and timber for fences, building construction and firewood. Changes in the subsidy regime controlled by the interpretation of EU Common Agricultural Policy led to many farmers focusing on beef and lamb production (Mansfield, 2018). Whilst studies from Wales suggest it is the economics that have held farmers back from re-engaging with forestry on their land (Hardaker, 2018), there are other more fundamental reasons.

> "Development officers in Yoshino, Minabe and Tanabe have been recruited specifically to revitalise the industry through diversification of products and better marketing."

In order to continue to compete effectively as costs increased on hill and upland farms, one of the first savings was the reduction in labour. Coupled with lack of relevant knowledge and skills, this situation has created inertia,

Using charcoal in foodstuffs, Minabe-Tanabe Area, Wakayama Prefecture.

making it complex to bring woods back on-line. Consequently, many farm woods are undermanaged and underutilised (Horne, 2017). Whilst we could assume this will be addressed through the new UK agri-environment payments and public goods agenda, it will not deal with the challenges of labour, skills and equipment. A more comprehensive support system is required to allow farm woods to become more multifunctional.

First, we can address the labour, skills and equipment shortage. Given that it is highly unlikely that farmers will have time to devote to this, irrespective of funding provided via the new public goods agenda, it might be more profitable to explore more novel forms of labour. One solution could be to draw on the forthcoming Farming Investment Fund to create peripatetic flying squads of woodland managers that move across a landscape bringing woods back into operation to a level where farmers themselves can then continue the management at a low level. This will also help solve some, but not all, of the skills deficit as maintenance is more straightforward than restoration. It will also allow for the provision of specialist equipment and give time for appropriate upskilling of farmers through training. The opportunity to bridge 'the technical language gap' will furthermore have to time to develop, which is not dissimilar to that between farmers and conservationsists

A second area to consider is the character of the supply. The potential for farm wood revitalisation in the English uplands is considerable. There are nearly 47,000ha of farm woods, of which roughly two fifths is in upland and hill farming territory (Defra, 2017). They are a range of types from ghyll wood, which can draw on agri-environment funding, to abandoned coppice and wood pasture, and larger blocks of hard and softwood. Our knowledge of the full nature of the resource is poor, and further work is required to appreciate the level and character of resource available for farmers.

> "It is important we think more innovatively about how we can help farmers realise their forest assets in a range of ways."

Third, we need to be thinking about novel markets of high value. This article has drawn on a range of rural development projects operating on the Kii Peninsula of Japan. Whilst some of the activities very much relate directly to aspects of Japanese culture, there are some that could be employed in other places. Constructing buildings from local timber for tourism accommodation, using charcoal in food production and making more of brash from initial management are all possibilities. Whilst work by Coed Cymru (2005: Table 1) clearly demonstrates small woods have a range of product, it could be argued that many of the woods are too small individually to be of economic value, especially on upland farms. This has been a challenge in Japan, so their solution has been to adopt a more community-level approach, where resource is managed and marketed collectively; hence the appointment of the economic development officers in Yoshino and Minabe/Tanabe bringing the supply chain components together to work collectively. For the UK, this will require skills development in operating small-scale co-operative style businesses, help with identifying markets and development of marketing skills.

Finally, but no means least is thought regarding economic sustainability of such a model of development. For farm timber,

Table 1. Possible farm wood products

	Veneer	Sports goods	Tool handles	Furniture	Joinery	Flooring	Kitchen ware	Turnery	Structural	Construction	Boat building	Telegraph poles	Sleepers	Fencing
Ash	x	x	x	x	x	x								
Beech	x		x	x	x	x	x							
Birch				x		x		x						
Oak	x			x	x	x			x					x
Sycamore	x			x	x	x	x	x						
Alder				x	x	x								
Cherry	x			x	x									
Sweet chestnut	x			x	x	x								x
Douglas fir										x				x
Larch										x	x			x
Pine												x	x	x
Spruce										x				x

(Source: Coed Cymru, 2005)
NB: Other species with distinct uses: lime, walnut, yew, apple, pear, hawthorn, plum, damson, poplar

there are two options, first short-term high margin markets where selective single felling goes on; this is reminiscent of the Yoshino forestry industry in Japan. Whilst returns can be high for a farmer initially, these will soon drop off as the 'prize' specimens are removed, (unless your forest is 400 years old, an entire hillside and not designated!) thus the development of longer-term markets will be needed. This is where the economic development officers have come in to deal both with the short- and long-term strategies based on present and future market analysis and trends; this includes the ideas outlined in this short article.

English upland farm woods are part of a broader multifunctional landscape, which will be supported partially by the new public goods agenda. Having said this, it is important we think more innovatively about how we can help farmers realise their forest assets in a range of ways. Labour, forestry and marketing skills, supply and demand are all key to success and we can learn from Japan in relation to these.

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