There is a great deal of innovation in the use of wood in construction, from impressive modern buildings to new construction products that reduce build times and improve building performance. As a renewable resource with proven low embodied energy, wood is both an environmentally responsible and a highly practical choice as a construction material. However, forest management practices vary throughout the world: some are highly effective in delivering a sustainable, long term supply of timber; whereas others are less so, and could result in forest depletion and significant environmental degradation. Against this background, a number of certification schemes have been developed that seek to ensure that all timber is harvested from sources that are at least legally-sourced, and at best, sustainably managed.

*Sustainable Use of Wood in Construction* explains how and why wood may be grown sustainably, and how this versatile material can be specified and – most importantly – sourced, for use in the construction industry. It explains the modern regulatory framework within Europe that seeks to eliminate the use of illegally-harvested wood, and it shows how to ensure that everyone who sells or uses wood for construction is following the rules. Finally, the book explains how, at the end of its first use in construction, wood can be recycled, by reprocessing into another wood-based construction material, or by using it as biomass.

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Also available

*Wood in Construction: How to Avoid Costly Mistakes*
Jim Coulson
Paperback, 978 0 4706 5777 5

*Structural Timber Design to Eurocode 5*
Second Edition
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Sustainable Use of Wood in Construction
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Jim Coulson

WILEY Blackwell
‘I think that I shall never see
A poem lovely as a tree’
Joyce Kilmer (1888–1918)
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I am starting to write this timber book in exactly the same location where I completed the writing of my last one: in the Caribbean. I must assure you, Dear Reader, that I’m not showing off, it just so happens that with the first book, I was scheduled to be on holiday at the same time as I was trying to finish it – and Barbados was a very relaxing place where I could get away from work and the distractions of everyday life. But then – lo and behold! – I was once again on holiday at the very time that I needed to begin working on this next book.

In 2012, my (hopefully helpful and informative) work: Wood in Construction: How to Avoid Costly Mistakes was first published. That book aimed to clarify much about the correct specification of timber and the most common wood-based materials, and also it attempted to kill off a few old wives’ tales along the way. So I am now following up that book with this one, which I hope will be thought of as a sort of companion to – or perhaps an extension of – the earlier book.

In this new one, my intention will be to show how wood really can claim to be the ‘miracle’ material of the twenty-first century (as if it wasn’t pretty good before). Because not only is wood a very strong, highly attractive and extremely versatile material in its own right; it is undeniably also – when properly grown, sensibly and well looked after – the one material on the planet that is completely and infinitely renewable. And, miraculously, it is at the same time an extraordinarily useful ‘store’ of atmospheric carbon; for the whole of its lifetime in our service.

Wood grows on trees (obviously). But perhaps more correctly, I should say it grows in trees, since it is the primary wood tissue (known as ‘xylem’) which makes up the majority of the overall volume of any individual tree. Xylem forms the entire trunk (and
of course, the branches too) of every single tree on this planet. Trees are, essentially, nothing more or less than fairly complex, ‘woody-stemmed’ plants. In other words, the trunk (or as we wood scientists prefer to call it, the stem) of any tree is made from the stuff that we know as wood; and which we trade commercially under the term ‘timber’ – or if you live in North America, it is called ‘lumber’ (no matter)

It is well known that the vast majority of plants, by their very nature and form, can be ‘planted’ by mankind and so they can be grown on, to any level of maturity as long as they survive. And, so long as they are placed into a more or less half-decent soil, with some sort of nutrient content to it, and are then allowed to grow up in whichever type of climate suits them best – warm or cold, wet or dry – then any plants can more or less thrive. Then – with the right amount of care (which in some cases may be minimal) – many, many plants can of course be harvested and used: for food, for fuel, for their fibre, for their oil, or whatever. And that principle, in a nutshell (or perhaps I should say, in a tree-trunk), is the key to the whole concept of the sustainability of wood as a material that we can, and indeed should, use. So it is my earnest philosophy that we all need to carry on using wood: and the more, the merrier.

That’s because wood – when looked after in the right way – is basically no more or less than a crop, which needs to be harvested: in the same way that we can (and do) harvest wheat, potatoes, sugar cane or rhubarb; to name but a few examples. It is true that the timescale may be a little longer with trees than it is with those various and aforementioned food crops, but you might be surprised to know that it’s not all that much longer, in a good many instances. Of course, it will very much depend upon the particular species or variety of tree that we might choose to grow, and the particular circumstances under which we are able to grow it. But my point here is that we need not necessarily wait for a hundred years or more – as so many people seem to think we must – when it comes to getting some useful timber from our trees. Nor do we have to always involve a second or third generation of humanity, after planting any individual tree, before we can fully reap its benefits: although, in a way, that is perhaps one of the great appeals of timber, at least in the popular imagination: the idea of leaving something of ourselves there for the future.

So in this book, I hope to show you first of all how wood ‘works’ (at least in the most basic and simple sense). And after that, my aim will be to show you how it is becoming much,
much easier to specify and use timber and wood-based products
in construction, without having to worry so much about
whether or not you are doing anything ‘wrong’. So please, let
me reassure you all – Mr Architect, Mr Engineer, Mr Builder,
(and yes, even Mr DIY-er) – that you can happily specify, design
and use this ‘wonder material’ that comes to us, courtesy of
trees. And you can do so again and again and again, ad infini-
tum, because wood is indeed the nearest thing we have to an
infinite resource.

As we go forward into a perhaps less certain future on this
planet of ours; we need to capitalise on the reality of wood’s
renewable-ness, and then we can also capitalise on that won-
derful fact more and more, for the present and the future
benefit of this planet that we all live on.

My first wood book was not, in any real sense, an ‘academic’
textbook; although it did contain some rather essential ele-
ments of ‘wood science’ which I felt were important for
understanding some of the later stuff that I then went on to
write about. And please be reassured: you needn’t worry
unduly about this new one, this book seeks to be even less
‘wood sciency’ than the last one, although I will still need to
cover a few matters of importance, about what wood is and
what trees are, just so that you don’t get too confused along the
way. But then I hope that you will better understand why
certain things are as they are; and why maybe they can’t be
altered too much, even if we should wish to try to do so
(although, in the best traditions of predicting the future, I’m
bound to be wrong about that claim, sooner or later!).

I have been studying wood for a very long time, about two-
thirds of my whole life, in fact. And in that span of around
40 years, I have witnessed an amazing amount of progress in
the way that timber is specified and used. But at the same time
I have seen, in some other ways, a considerable amount of
wasted – or maybe I should say, misdirected – effort in the
manner in which the care of the world’s forests has been high-
lighted or emphasised. Many of those forests have in fact been
pretty well looked after for a long, long time (although in some
places, I do admit, they have not been so well looked after, in
more recent times).

I have also seen some – let us say, misguided – efforts from
some of those who would wish others to use wood more
‘wisely’. I have personally either seen or heard at first hand,
instances where the ‘environmentalists’ have sometimes
insisted upon practices that have not always (in my own
opinion) been most productive, or most conducive to winning
the co-operation of those whom they were seeking to influence.
But more of that later in the book.

I have also witnessed some of the ways in which those who
have responsibility for the forests (their ‘stewardship’ as some
like to say) have really taken that responsibility very seriously
and in a number of examples, have been doing so for around
two centuries. And that’s long before any of the present-day
‘green’ attitudes became either fashionable, or politically sensi-
tive. (Ah, but then I have been fortunate to have been able to
see things on a more global scale; rather than just the narrow,
parochial, and – I’m sorry to have to say – fairly typically British
way of looking at things.)

Let me explain that last comment a bit.

In this country (and by the way, if you are a reader from else-
where in the world, please accept my apologies for seeming to
exclude you; it’s nothing personal. I’m writing this book essen-
tially from a UK perspective, and thus primarily for a UK
readership) it appears to me that we – the British, that is – seem
to have the view that everything we say, do or experience
must be more or less the same for everyone else in the world. That
attitude (some might say, ‘worldview’) is very much bound up
in the British psyche, I believe. It’s the sort of outlook that used
to be called ‘jingoistic’ – and, although the word has been more
or less deprecated since the days of Empire, it seems that some
of the basic attitudes in this country have rather carried on as
they were, regardless of the fact we are in a new millennium
(and some might even say, in a new reality).

In my own not inconsiderable experience, I have been very
aware of a tendency for the UK-based ‘defenders’ of wood to
react somewhat unfavourably to its continued, and apparently
unlimited, use (that is, they often express great caution and
worry about anyone using any sort of wood for anything at all,
and bang on all the time about ‘saving trees’) as though the
whole world were in exactly the same position as ourselves,
vis-à-vis the availability of timber … but happily, a lot of the
rest of the world isn’t just like us.

Here in the UK we have a relatively limited stock of wood-
land, of any sort and that’s primarily because we also have a
pretty limited stock of the necessary countryside to grow those
woodlands (or should I say forests) on. As a nation we are a
huge nett importer of timber and wood-based products, to the
tune of somewhere around 70 per cent of our total require-
ments. And because of that reason, it somehow seems as
though we cannot get our collective national head around the fact that many other countries in the world might actually still have an awful lot of useful wood knocking about in their own forests. Surplus wood, that is. Wood that is spare and available for export. In other words, there are places which have ‘renewable’ wood, harvested from forests that have been stable, and growing, and ‘sustainable’ for a very long time. Enough for all of their future generations to keep on growing and making a living from, in fact.

I first became involved with the UK timber trade in the early 1970s: around the time that the first ‘oil crisis’ struck the developed world; and that was long before anyone was using the term ‘sustainability’ in any meaningful or widely-publicised sense. But luckily (for me) even back then I had very good contacts with the North American wood industry – which was still a major source of imported timber in those days (especially from Canada). I also had a very good relationship with the Scandinavians (mainly the Swedes and Finns), who had themselves by then been exporters to the British Isles for something over 500 years. (All right, you pedants: I know that Finland, as a separate country, isn’t 500 years old … but that part of the world, whatever it was called back then, had been exporting ‘Baltic redwood’ to England since about the mid-fifteenth century.)

Canada and Scandinavia have been major sources of sawn timber and wood-based boards (as an aside, this latter entity consisted mostly of plywood in the early part of the twentieth century, since there was no OSB, and not a huge amount of chipboard, even as late as the 1970s when I was newly ‘into’ wood-based panel products) exported to the UK, for several generations. And both of those timber-producing regions have had policies of ‘renewable’ forestry in place for well over a hundred years, and back then, in the nineteenth century, there was certainly no FSC or the like, to stir things up.

In order for you to understand the concept of what those exporting regions were doing all that time ago – and without any outside prompting or political pressures from the ‘green’ lobby – think of the old saying ‘selling off the family silver’, except that for the word ‘silver’ read ‘forests’, and for the word ‘family’ read ‘nation’. So it shouldn’t then take too much imagination to realise that a country which is rich in forests (and very often, such countries are not rich in too many other things); but which also has a relatively small population, would see those forests as a vital source of income and foreign exchange. And that being the case, why then would they willingly cut
down all of those trees for short-term gain and so leave themselves with nothing for the future? Of course they wouldn’t, would they?

Well... yes and no – and it all depends upon where you’re talking about, and exactly when things changed in certain places, from basically good to more or less bad. But then, we largely have world politics to blame for that more recent state of affairs. Most ‘developed’ nations with large forest areas (such as Canada, Sweden and so on) behaved – and continue to behave – really well, as I have just touched on, a few paragraphs earlier. But unfortunately, many of the ‘young’ and often newly-independent nations, who were also in possession of large, natural forests (and, as it happens, those were mostly tropical forests) very soon fell prey to political turmoil and corruption and so the ‘ideal’ of managing their nation’s forest resources for their own economic future somehow got lost, corrupted or abandoned, or at best, seriously derailed for quite a long time.

Therefore, just like the proverbial curate’s egg, the story of forest conservation and sustainability right around the world is, as they say, ‘good in parts’.

By and large, the ‘Westernised’ nations had already put in place very effective policies to conserve and expand their forests. But the ‘developing’ nations – who had often possessed quite significant and workable forestry policies, many of which had been put in place when they were part of someone else’s Empire – all too often fell into corrupt ways; and thus allowed their forest practices to seriously deteriorate for a regrettably long time. Happily, that process of mismanagement and decline eventually changed – at least in many of those places – and it is still changing and improving today of course.

Now then, all of the foregoing background information (or ‘ramblings’ as you might call them) brings me back to the main point and purpose of this book: I want to provide some basic information about where our uses of ‘traditional’ woods came from; but then I want to bring things up to date and explain what’s happening nowadays in the world of wood, especially with regard to forest management attitudes. And along the way, I’d like to unravel some of the myths, but then also explore the facts; and then I will check out the regulations that have sprung up, ever since the timber trading world turned ‘Green’. That last landmark was – as far as I can dimly recall – sometime in the late 1970s or early 1980s: which was, as far as the timber trade was then concerned, perhaps a little bit later than in many
other aspects of everyday life, but then, that’s rather typical of
the timber trade in all things.

Matters are still changing and evolving of course, even as
I write this, so maybe it’s best that you should regard this volume
as less of a definitive textbook, but more of a sort of ‘position
paper’ as to what’s going on here and now. It aims to point out
where we’ve come from and then to point the way that things
seem to be going, as far as I can presently see. And I should also
advise you that it is very much my own ‘take’ on things, and so
the opinions in it (as opposed to the many facts which are also
included) are very definitely my own and no-one else’s.
However, this book is most certainly intended to be helpful and
encouraging and I am striving to get it as up-to-date as I can
manage to make it, at a time when we are in what seems to be
such a constantly-changing regulatory environment.

My overriding purpose is that I want to leave you with the
absolutely positive feeling that it’s not just ‘OK’ to be thinking
about using wood. I want you to know that specifying and
using timber and wood-based products – and hopefully, using
even more timber than you already do – is actually beneficial
for all of us who live on this planet. Well, I’ve made a (fairly
lengthy!) start; and I’ve set out my stall in no uncertain terms,
so now I’d better get on with it!

Jim Coulson
Holetown, Barbados
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