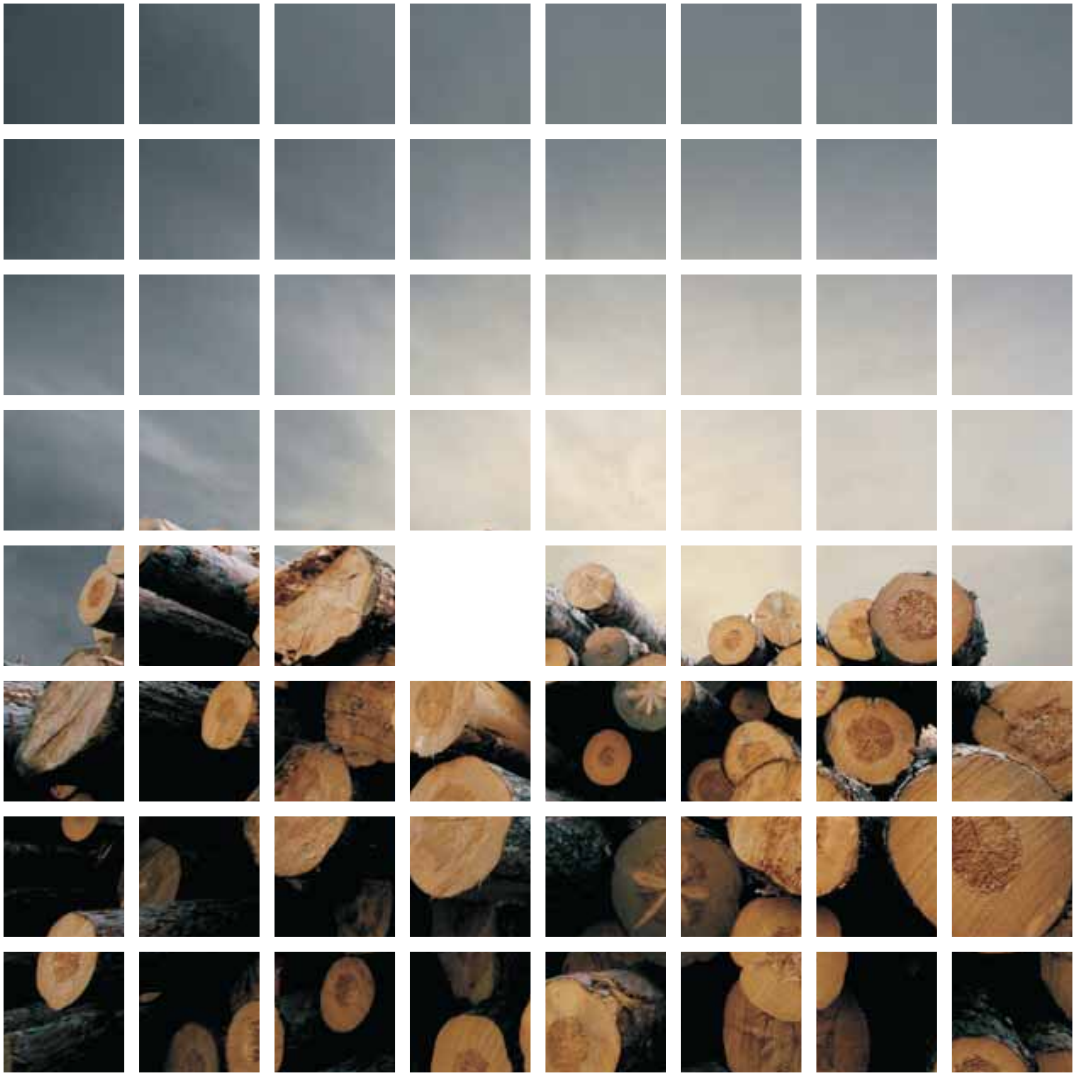
THE WOOD FOUNDATION™



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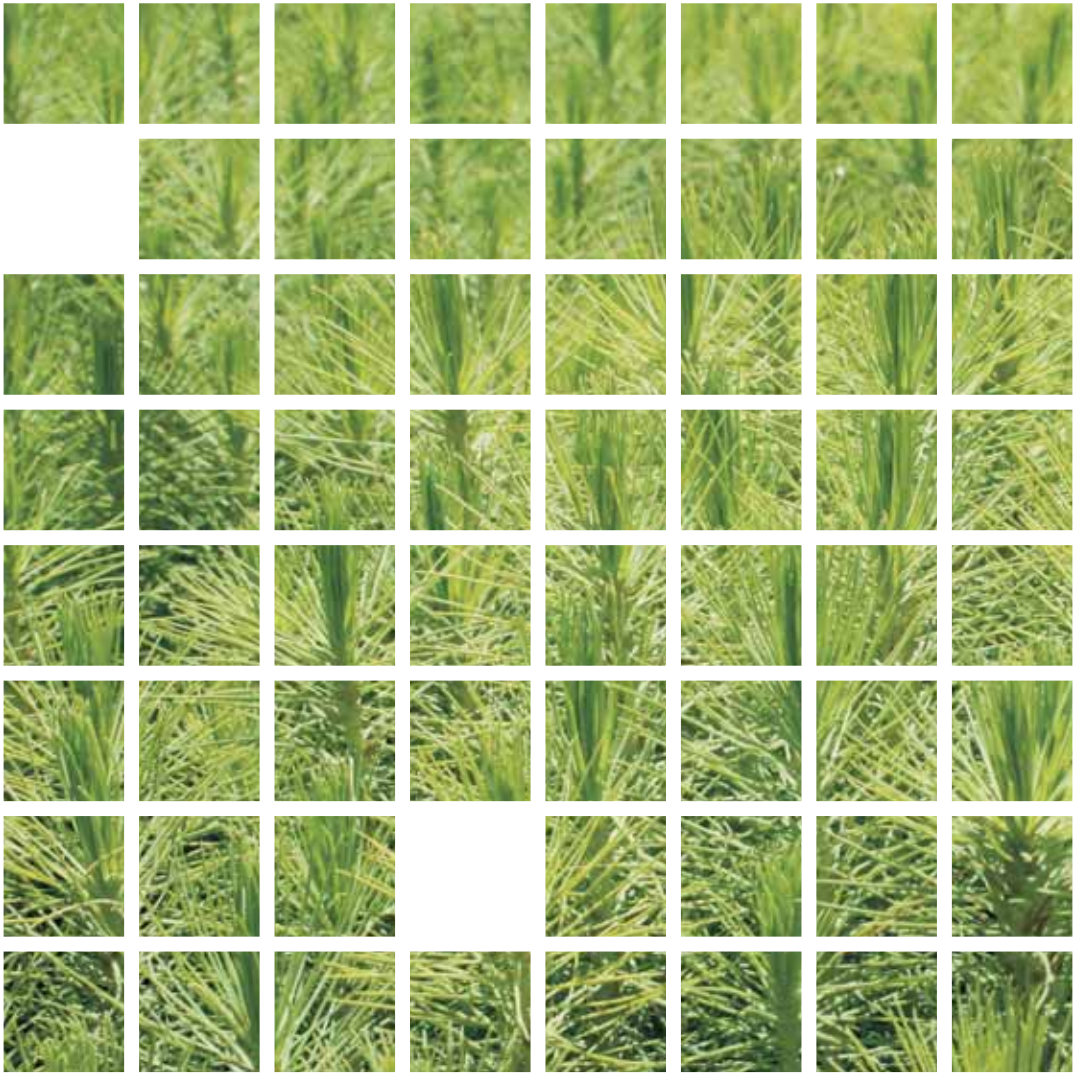
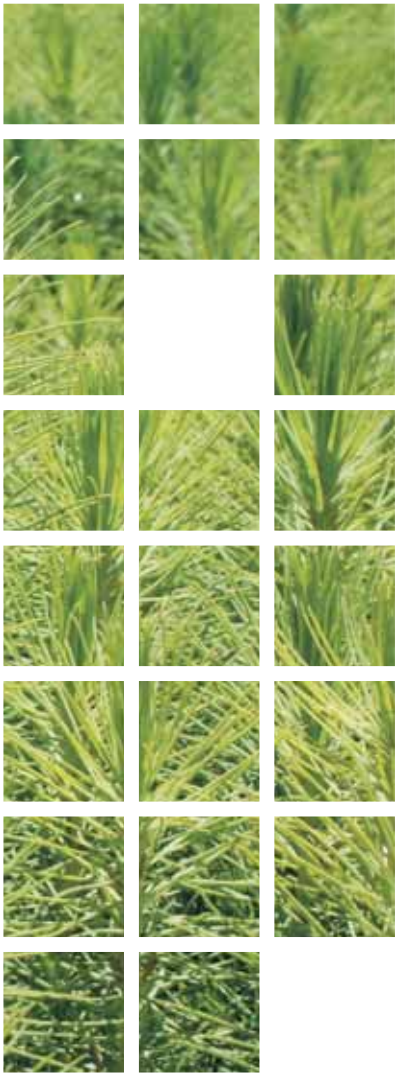


Photograph courtesy of SA Forestry Magazine



HISTORY OF THE WOOD FOUNDATION

The Wood Foundation originated when various stakeholders in the forestry, wood processing and related industries got together to discuss an association to promote wood in a generic manner.

Preliminary work, undertaken by a committee of industry representatives, began in 2008 under the banner of the "Timber Marketing Forum". This body was formalised and officially constituted in June 2009. Shortly after that the "Timber Marketing Forum" was rebranded as **"The Wood Foundation"**, which was seen to be more inclusive and presented an opportunity to promote wood throughout the value chain, from the grower all the way through to the home owner.

The objectives of The Wood Foundation are:

- to promote and encourage the growing of trees and the use of wood and wood products.
- to educate and reinforce awareness of wood's attributes as a preferred structural material amongst the likes of architects, specifiers, service providers, structural engineers, quantity surveyors, design consultants, developers, merchants, agriculture, construction industry and the public at large.
- to promote wood as a naturally renewable and environmentally friendly product.
- the reinforcement of the generic wood 'brand' through awareness activities in various markets, within and outside the borders of South Africa.

The Wood Foundation's Constitution is formulated as a non-profit organisation with associate and affiliate membership open to industry associations, companies and private individuals.

The facts speak for themselves. Wood is a renewable material with an exceptionally low carbon emissions footprint, long life and extensive durability through correct treatment, easy to maintain and has excellent insulation and acoustic characteristics, while also being flexible to work with and aesthetically pleasing.

Founding Members:

Association Members:

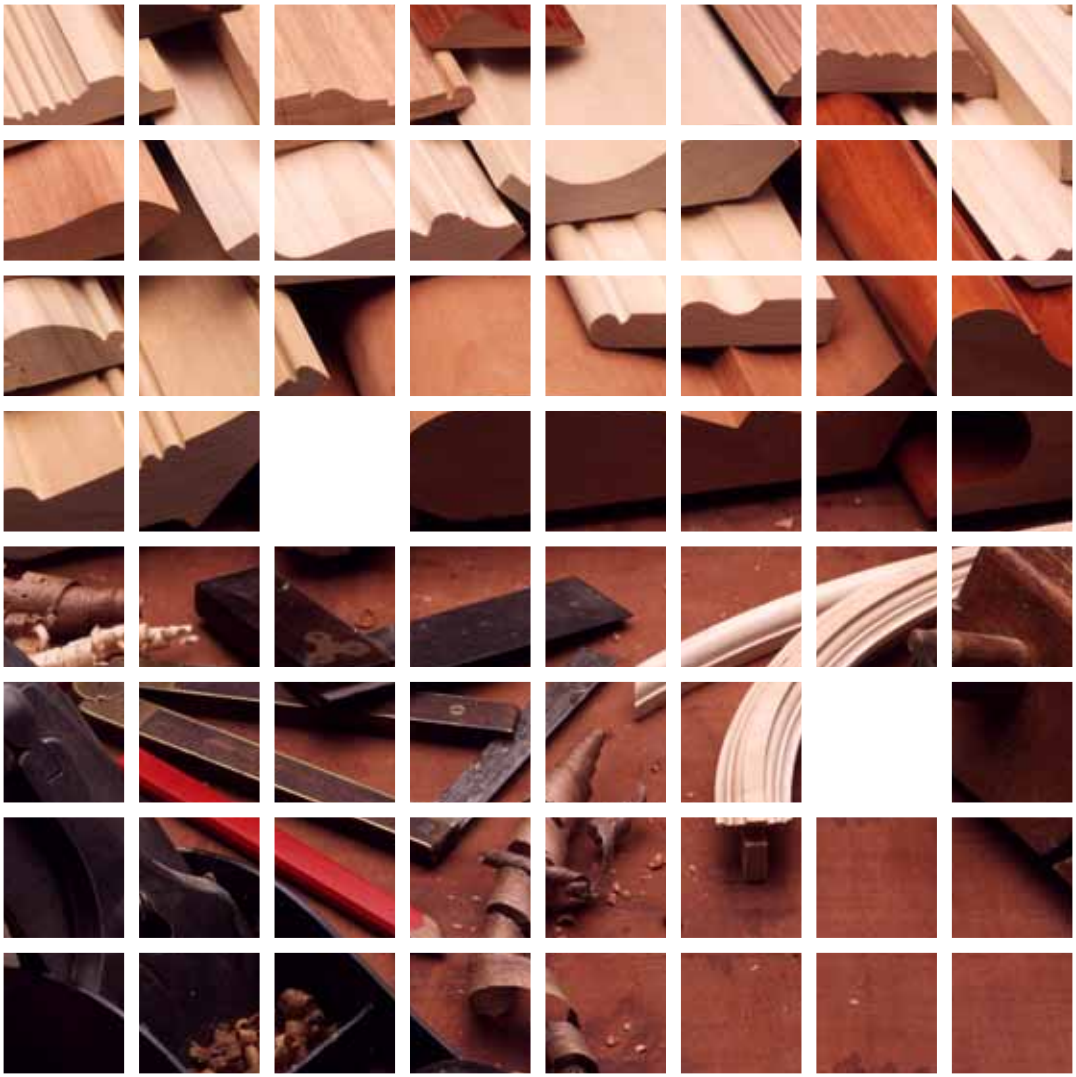
- Forestry South Africa
- Institute for Timber Construction
- Sawmilling South Africa
- South African Utility Pole Association
- South African Wood Preservers Association
- Thatchers Association of South Africa
- Institute of Timber Frame Builders (formerly the Timber Frame Builders Association)

Private Members:

- Arch Wood Protection (SA) (Pty) Ltd
- MiTek Industries South Africa (Pty) Ltd

Affiliate Member:

- Department of Agriculture, Forestry and Fisheries - Directorate: Forestry Policy & Strategy



THE BENEFITS OF WOOD

Wood is one of the few genuinely renewable building materials produced in South Africa from trees that are grown in sustainably managed forestry plantations. Once the trees are harvested, new seedlings are planted to replace them, thus ensuring a continuous and sustainable flow of raw material into the future. Wood can also be re-used for other projects once its original purpose has been served. Wooden structures can be erected with less impact on the surroundings, since lighter weight construction machinery, equipment and tools are used. It is also easier to build in more difficult to reach locations due to the flexibility of using wood products

Carbon Footprint

The "Carbon Footprint" of a product or activity is a measurement of the total amount of greenhouse gas emissions released into the environment from that product or activity over a given period of time. Greenhouse gas emissions from all sources are consolidated and changed into units of CO_2 equivalent, which are used to standardise the measurement of greenhouse gas emissions and help make comparisons between different products and industries over time. Carbon emissions are usually measured in metric tons per year. Of all mainstream building products, wood scores the lowest in terms of its carbon footprint impact.

Another important concept when talking about trees is their ability to assist in the fight against

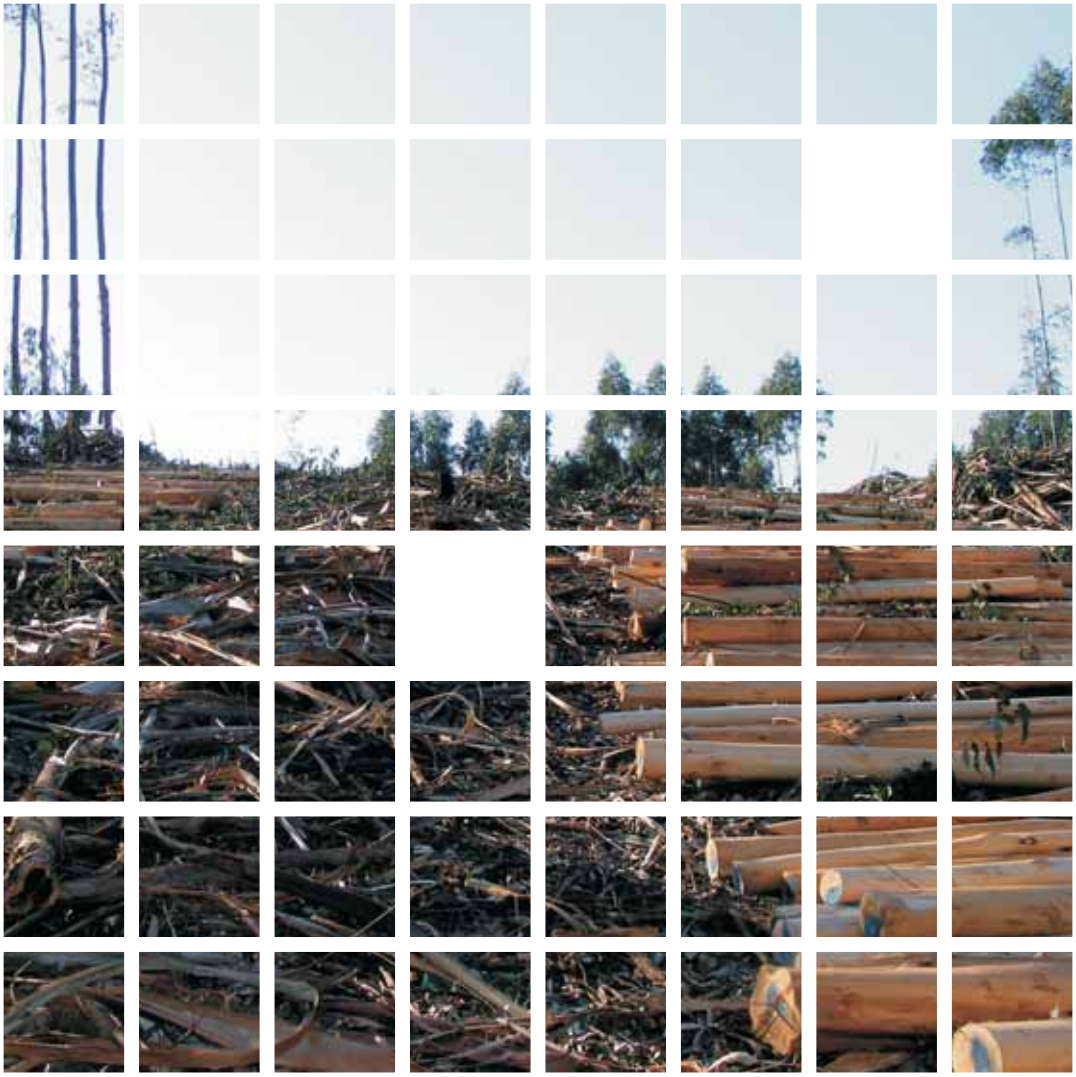
The Carbon Cycle. Source: Wood for Good

global warming – referred to as the "Carbon Cycle". Basically this is a chemical process whereby carbon dioxide is turned into an organic state (carbon) and "stored" in a tree's tissue until at some future stage, through processes such as combustion or rotting, it is released back into the atmosphere as CO_2.

In the case of wood products, the carbon cycle could best be explained as follows. Growing forests (trees) absorb carbon dioxide (CO_2) as they grow, thereby creating a "carbon sink", whilst simultaneously producing oxygen (O_2), which is released into the atmosphere. Mature trees are harvested and processed by mills into sawn timber (lumber), wood chips, fibre for paper pulp, often using up to 75% of the required energy needed in the conversion process from renewable energy sources such as sawdust and off-cuts. The output of these mills is then manufactured into a whole range of products. Sawn timber is further manufactured into roof trusses, cable drums, pallets, structural timber for construction purposes and furniture. Compressed wood chips and fibre are turned into timber board products such as chipboard and medium density fibreboard (MDF). Pulp is used to produce various paper and packaging products. All these production processes provide yet another carbon sink. Once a wood product has reached the end of its useful life in one application, it is often recycled for secondary material, thereby extending the carbon sink process even further. Finally, energy can be produced from the waste wood products, thereby substituting for fossil fuels. However, industry and vehicle pollution continue to create more CO_2 , which is in turn absorbed, by the growing forests (which have been replanted) and the carbon cycle repeats itself.

Hence, wood from sustainable plantations can in fact be better than carbon neutral. In fact, research has shown that wood is the only mainstream building material, which, during its production, actually has a net impact of absorbing CO_2 from the atmosphere rather than emitting it. It has been calculated that no less than 1.7 tons of CO_2 is absorbed, net of all the energy used in the growing, harvesting, transporting and processing of 1 ton of wood. By comparison, concrete production releases 159kgs of CO_2 into the atmosphere, steel, 1 240kgs and aluminium, a massive 9 300kgs.

These properties mean that the higher the proportion of wood used in the construction of a building, the lower its carbon footprint.



For every cubic metre of sawn timber used instead of other building material around a ton of CO_2 is saved from being released into the atmosphere. For example, 3 tons of CO_2 can be saved from the 20-ton footprint of a typical traditionally built brick and mortar 3-bedroom house by using timber framing. Furthermore, should timber be substituted wherever possible, including the use of softwood exterior cladding, an additional 14.6 tons of CO_2 can be saved, resulting in a footprint of a mere 2.4 tons – a total reduction of 17.6 tons! If you use enough wood, a building can be carbon neutral or better [(1)].

Embodied Energy

In assessing the environmental impact of wood as a building material, it is necessary to look at the concept of embodied energy and review how wood compares to other building materials. Embodied energy refers to the total amount of energy used to fabricate particular building materials from raw material to installation and is measured in Mega Joules (MJ) per weight or area. Wood scores the most favourably compared to other building materials. International research has shown that on average a ton of bricks requires 4 times the amount of energy to produce than a ton of sawn timber, concrete 5 times, glass 6 times, steel 25 times, and aluminium, a whopping 126 times more [(2)]. Apart from low embodied energy, wood structures have low lifetime (or operational) energy usage compared to other materials. This is largely due to woods' inherent thermal insulation properties.

Energy Efficiency

With the pending energy efficiency codes, timber will have a major advantage, as mentioned above. Energy efficiency entails making sure that the minimum amount of energy is used to heat or cool a building over its lifetime. Wood in its own right is natural insulating material, but when combined with other materials such as fibre or foil insulation, can optimise the thermal comfort for the building's inhabitants [(3)].

Superior Insulation

Wood is a natural insulation element. Timber provides comparatively good insulation against noise, temperature and electricity. Wood has the best thermal insulation properties of any mainstream construction material. Wood is 5 times better than concrete, 10 times better than brick and 350 times better than steel. [(4)]

Long Lasting

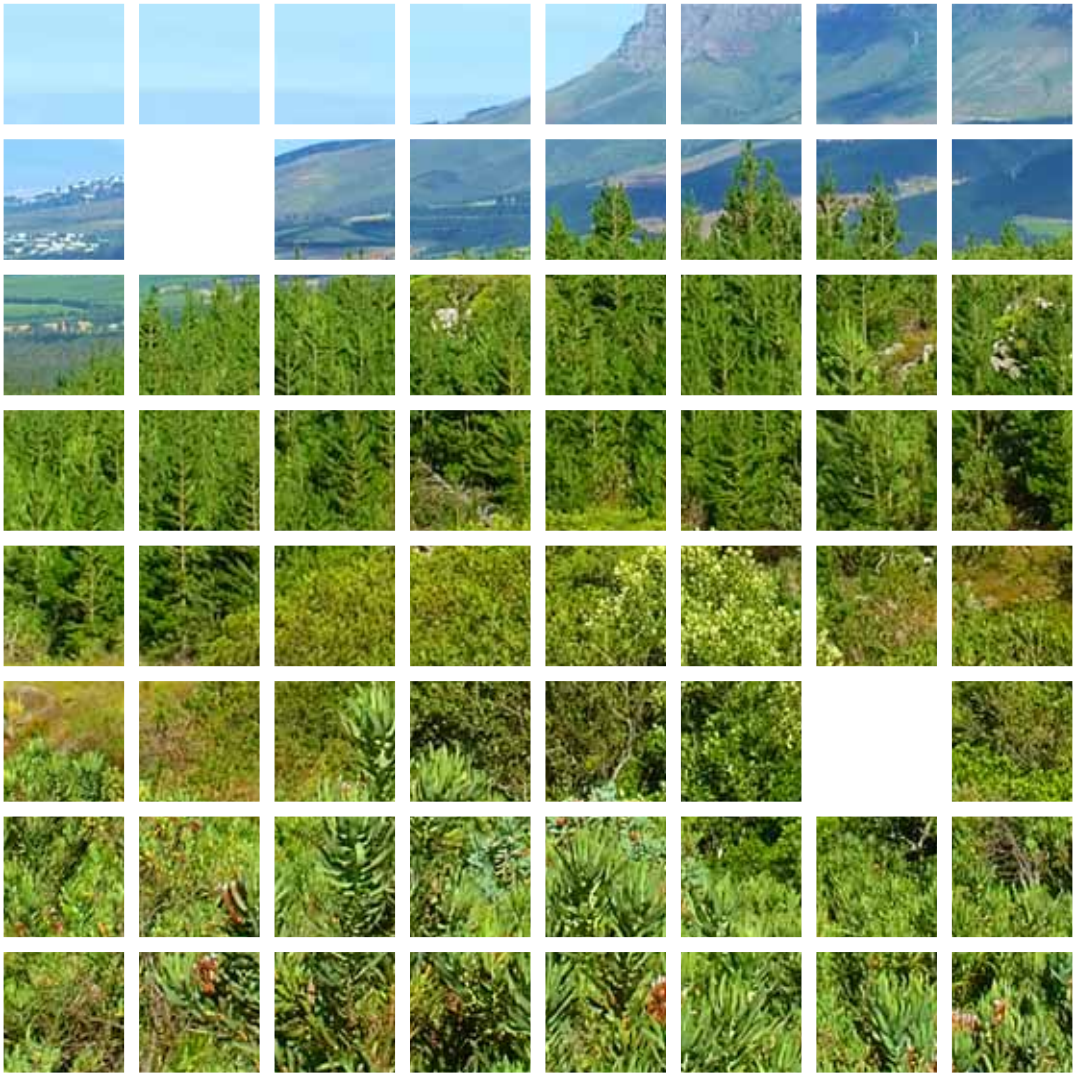
A wood structure will last just as long as a brick and mortar building – after all there are thousands of timber buildings in Europe, which have been around for many centuries. In actual fact, the oldest wooden building in the world is the Temple of the Flourishing Law, a Buddhist Temple, situated in Japan, which, dating back to AD607 is just over 1 400 years old. The treatment of timber prolongs its life even further in providing protection against fungal decay, termites and borers.

Conclusion

Trees are wonderful plants - they not only provide enormous environmental benefits which, amongst others, help to mitigate the effects of global warming and produce life giving oxygen - they provide us with wood. Wood is not only aesthetically pleasing, it is the only true renewable building material and has inherent physical properties and characteristics which, by any measure, make it the most versatile and environmentally friendly building material that exists.

Footnote:

(1) www.woodforgood.com
(2) Edinburgh Centre for Carbon Management, report 196, Carbon benefits of timber in construction, 2006.
(3) www.woodforgood.com
(4) www.woodforgood.com



THE FORESTRY SECTOR

South Africa is not well endowed with indigenous forests. So, when the first European settlers arrived in the country, in an effort to meet their increasing demand for timber products, the limited indigenous forest resources that were available were rapidly exploited. In recognition of the need to conserve this diminished resource, the Cape Colony enacted legislation in the late 1800's to prevent its over-exploitation. Without the ability to utilise this indigenous resource and in recognition of the need to supply the local market with timber, the Government embarked on a policy to establish man-made plantations of fast growing tree species to meet the timber needs of a rapidly developing economy. The severe shortage of timber products experienced during World War I (at that time virtually all timber was imported), led the Government to embark on an accelerated drive to increase the country's timber resources for "strategic" reasons. The Government again was the driver behind the expansion of the planted area during the Depression years of the 1930's through extensive 'Public Works Programmes'.

From these beginnings, the South African Commercial Forestry Industry, 83% of which is now owned by 9 corporate timber companies, 1 300 commercial timber farmers and over 20 000 emergent black timber growers, the rest being owned by the State, has grown into a multi-billion Rand Industry covering an area of 1 260 000 hectares. Although spread out in a narrow strip along the Eastern Escarpment from Louis Trichardt in the North to Cape Town in the South, the bulk of the country's plantation forests are to be found in Mpumalanga (41%) and KwaZulu-Natal (39%). Due to ideal climatic conditions, this intensively managed renewable plantation resource is one of the most productive in the world, producing on an annual and sustainable basis 20 million m3 (or 17 million tons) of roundwood per year, with the two most important products being pulpwood (67%) and sawlogs (25%). The down-stream processing sector converts this timber into pulp, paper, sawn timber, mining timber, poles, charcoal, matchwood and a whole host of other products. The export of some of these products, mainly pulp and paper, generates the country substantial foreign exchange earnings, way in excess of the value of forest product imports.

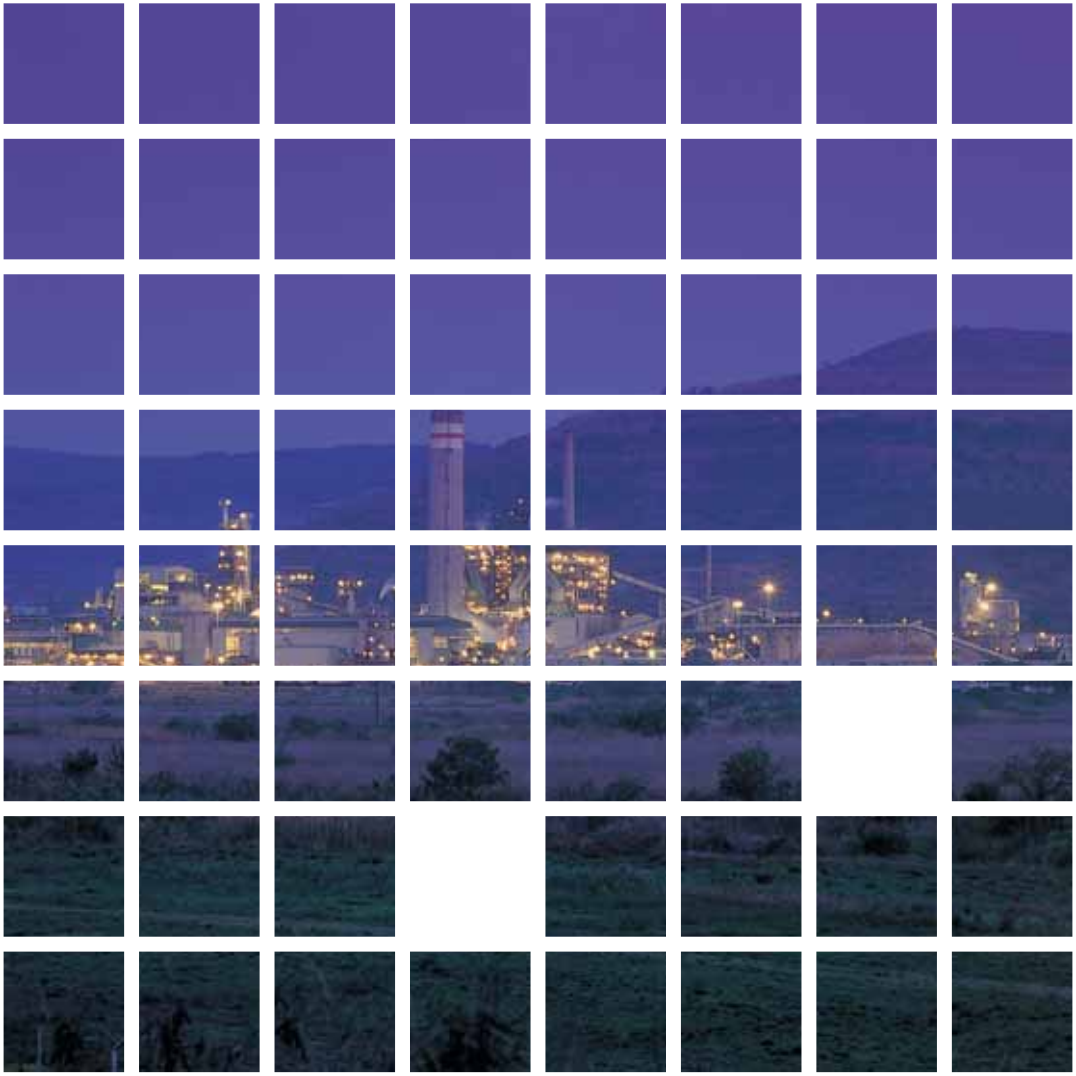
As well as the pure economic benefits of the Industry on a macro-level, as highlighted above, the Industry plays a huge role in terms of the upliftment of rural communities. This is through the provision of 70 000 forestry jobs, and a further 100 000 jobs in the processing industry which it supplies with raw materials, plus its provision of social infrastructure, including clinics, schools, crèches and sports and recreational facilities. It is estimated that no less than 2.3 million people are, one way or another, dependent on the Forestry Industry and the Forest Products Industry for their livelihoods.

In terms of its environmental credentials, the Industry has, from its very inception in the 1880's, been at the forefront of environmental conservation. This can be highlighted by the fact that South Africa is currently a world leader in practicing "Sustainable Forest Management" (SFM) with no less than 80% of its plantation area being certified by the Forest Stewardship Council (FSC) as being managed in a responsible and sustainable manner. In addition to the area planted to trees, the Industry manages a further 500 000 hectares which is used for environmental and water conservation purposes and that of any land use, has the highest number of Natural Heritage Sites and Sites of Conservation Significance within its forestry estates.

In addition, although covering a relatively small area, South Africa's plantations do, nevertheless, play a small part in helping to mitigate global warming through their role as "carbon sinks".

Although the Industry is based on a renewable and sustainable resource, the Industry faces many challenges. Given the need to supply an ever increasing demand for timber products to a developing economy and the fact that, due to climatic and water considerations, the ability of the Industry to expand its physical "footprint" is extremely limited. Expansion of only 100 000 ha in the Eastern Cape and 40 000 ha in KwaZulu-Natal is the limit. The Industry has invested in research to ensure that the productivity from our resource continues to improve, through improved tree breeding and improved management techniques for example, as well as to protect the resource that we do have, from pests, diseases and fire.

Through these efforts it is hoped that the SA Forestry Industry can continue to play a vital role in providing the nation with the timber that it needs well into the future and to benefit those rural communities in which it operates.



Photograph courtesy of SAPPI Ltd

Ngodwana Kraft Mill, Mpumalanga

THE PULP & PAPER INDUSTRY

Overview of the Pulp & Paper Industry:
Since its humble beginnings in forest plantations established at the end of World War I by the State, South Africa's pulp and paper industry has grown from strength to strength. Sappi was formed in 1936 and Mondi in 1967. Today the two companies are amongst the top twenty largest pulp and paper companies in the world. Both have an impressive geographical footprint, Sappi in the USA and Europe and Mondi in Eastern Europe, Europe and Russia.

The industry branched into the global export market in the 1980s, and since then has blossomed into a R15 billion industry. Annually the industry produces approximately 2.4 million tons of pulp and 2.7 million tons of paper, a lot of which is exported, resulting in a significant positive trade balance for the country. Paper and board per capita consumption in South Africa is just under the world average of 55.7 kg per person and with a rising middle class, notwithstanding the 2008/2009 recession, local demand definitely has room for growth.

Sappi is the largest producer globally of coated wood free paper - a term that means while it's made from wood it's not made using mechanical pulp (1 in every 6 pages of coated paper worldwide is Sappi paper). Sappi maintains a strong presence in South Africa. Sappi Fine Paper has mills in Port Elizabeth, Springs and Stanger, while Sappi Forest Products includes the Sappi Saiccor mill, the Sappi Kraft mills of Cape Kraft, Ngodwana and Tugela. Locally, Sappi produces printing and writing grades, newsprint, fluting and kraft packaging grades and sack kraft. Sappi Saiccor is the largest dissolving pulp mill in the world.

Mondi has mills in Durban, Felixton, Piet Retief, Richards Bay and Springs. Products range from printing and writing grades, to fluting and packaging grades including white top liner and various specialised board grades. Mondi Shanduka produces newsprint. Mondi produces over a million tons a year of A4 copier paper in Europe and is well positioned to supply softwood pulp to China from its mill in Russia.

South African-owned Nampak is Africa's largest packaging organisation and the world's most diverse packaging company. It also falls into the world's top 100 paper producers, manufacturing board at its mill in Rosslyn (Pretoria) and tissue in mills in Johannesburg, Durban and Cape Town.

Tissue manufacture in South Africa is growing and in 2008, mills in the country produced in the region of 220 000 tons of tissue. Nampak Tissue, Sappi Stanger and Kimberly-Clark South Africa produce the lion's share of this, with around 90 000 tons being produced by smaller independent mills.

Kimberly-Clark South Africa produces well-known international brands at its mill in Springs, utilising both recovered paper and virgin pulp sourced from FSC certified forests. The industry collects over 1 million tons of recovered paper a year and this figure is currently on the increase. Overall South Africa currently has 33 pulp, paper and board mills that supply converting operations. The majority of these mills are located in the Provinces of Mpumalanga and KwaZulu-Natal, in close proximity to fibre sources. Other noteworthy paper producing companies are Gayatri Paper, Lothlorien and SA Paper Mills as well as Midlands Tissue which is now the largest of the smaller independent tissue mills. In conclusion, the pulp and paper industry plays a significant role in driving South African growth, offering direct employment to 12 000 people.

Facing Challenges

Without continued research and development the Industry will not stay ahead of the global game with bigger, faster machines driving down prices of commodity products.

With worldwide demand lower than usual, the threat of having to compete with dumped product is very real. Nevertheless industry is proud to be signatories to the Forest Sector Transformation Charter and looks forward to working with their new department, Department of Agriculture, Forestry and Fisheries (DAFF), in order to facilitate delivery of the Charter commitments by both Government and Industry.

Finally, if the raw material base does not grow nor will the Industry. This is a fundamental challenge that must be overcome otherwise a sunrise industry that has, to date, managed to increase productivity off a shrinking land base, will become a sunset industry.

Photograph courtesy of SA Forestry Magazine

SAWMILLING

The development of the Sawmilling Industry in South Africa can be divided into clearly distinguishable eras. The first of these, which can be called the pioneer phase, began with the arrival of Jan van Riebeeck and lasted until around the arrival of the 1820 Settlers. Indigenous species were utilised for constructional purposes, furniture and boat building. All conversion of the round logs was done by hand, using either an axe to produce square beams, or pit sawing to produce planks. Timber in bulk or beam form was exported from amongst others, Plettenberg Bay harbour.

The second era, which can be classed the mechanisation phase, began with the arrival of the British Settlers and lasted until approximately the end of the nineteenth century, when a start was made with the planting of exotic tree species to supplement the severely depleted indigenous forests. George Rex of Knysna is purported to have built the first mechanical sawmill in 1802. The Hon Henry Barrington, MP who can be considered the father of the mechanical sawmilling industry in South Africa, commenced with the building of a sawmill equipped with a water turbine for the propulsion of his sawing machines in 1860.

The third era was followed by the eventual availability on the market of thinning of locally grown conifers, and the accompanying problems for sawmillers to process this new raw material. It was not only of smaller size but also contained more inherent defects than the imported lumber. The sawmiller therefore not only had to adapt his machines to process the smaller sized logs, but also had difficulty in ensuring the quality of his timber. There were also some private growers who followed the State's example in establishing coniferous plantations and who processed their own timber under these adverse conditions. The State erected its first two sawmills at George and Elandshoek, the latter coming into production during 1937. By the time the Second World War started in 1939, there were 45 private sawmills processing 80% of the country's total production.

The fourth era in the development of the Industry involved the part played by the private sawmiller in the industry, mainly through the actions of the S.A. Lumber Millers' Association and more recently Sawmilling S.A. Eventually, in 1980, the State announced that, in its efforts to rationalise the Industry, it would slowly decrease its activities in this field. These developments allowed the private sawmillers to establish their businesses on a long-term basis, to better plan their operations, to improve their production facilities and efficiencies and thereby to achieve a well established and organised industry.

Sawmilling Today

The most important machine in a sawmill is the first machine in the production system. This machine is called the log break-down. It can be either a frame-saw, a band-saw, a circular-saw, a double-log-edger or a log chipper canter and lends its name to the rest of the mill, i.e. the mill will be called a frame sawmill, a band sawmill etc. Sawmill sizes in South Africa are usually expressed in terms of total annual log intake. Of the 201 sawmills currently in operation, 176 fall in an individual mill volume intake bracket up to 50 000 m^3 p.a. These sawmills only produce 39% of the. industry's volume. The remaining 25 sawmills, with individual volume intakes of more than 50 000 m^3 p.a. produce the remaining 61% of annual production.

In addition, South Africa produces ±200 000 m^3 of hardwood lumber p.a. (this excludes mining timber). More than 90% of the hardwood lumber is Eucalyptus grandis. Small volumes of Karri (Eucalyptus diversicolor) and Blackwood (Acacia melanoxylon) lumber are produced in the Southern Cape region.

Sawmilling South Africa (SSA)

This Association's extended objectives are, to provide a sawmilling technical information service, both to members and to users of wood and to represent the interests of the formal sawmilling sector in negotiations with Government and other industry associations.

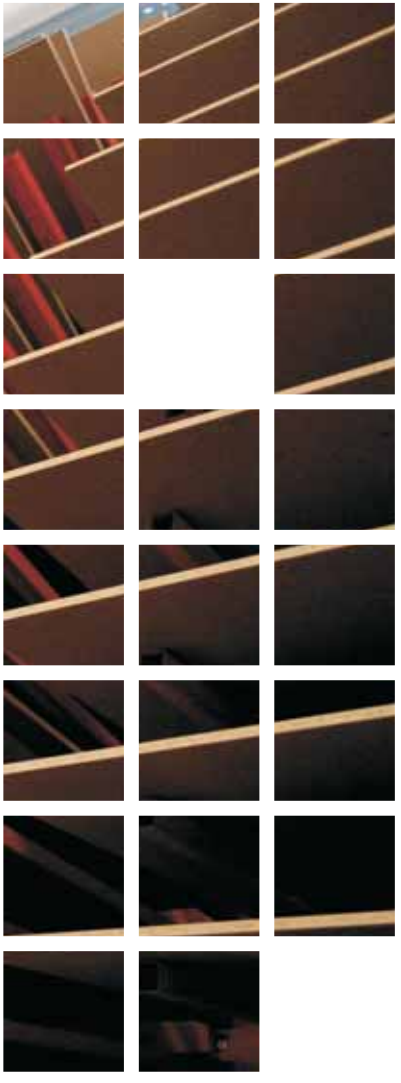
For members, the Association (free of charge) undertakes visits to mills, answers telephonic enquiries, holds annual technical workshops on log milling and lumber drying, supports the SA Saw Doctoring and Lumber Drying educational institutions and maintains an information / media centre at the Nelson Mandela Metropolitan University (Saasveld Campus) in George.

South African sawmillers have learned to survive and prosper in an international arena with no tariffs or import controls protecting the domestic market, thus securing the livelihood of the 30 000 people who work in the sector.

Furniture and joinery manufacturers are increasingly using South African pine and lumber to penetrate some of the most competitive markets in the world.

Photograph courtesy of SA Forestry magazine

PG Bison Plant, Ugie, Eastern Cape



BOARD MANUFACTURING

Timber board refers to products, which are made by compressing woodchips and other wood residue into a condensed panel by using heat and pressure. The two types of timber board products are particleboard (chipboard) and fibreboard, which includes medium density fibre board (MDF), insulation board and hardboard. There are well known brands such as BisonBord, Novobord and Masonite under which these products are sold in South Africa.

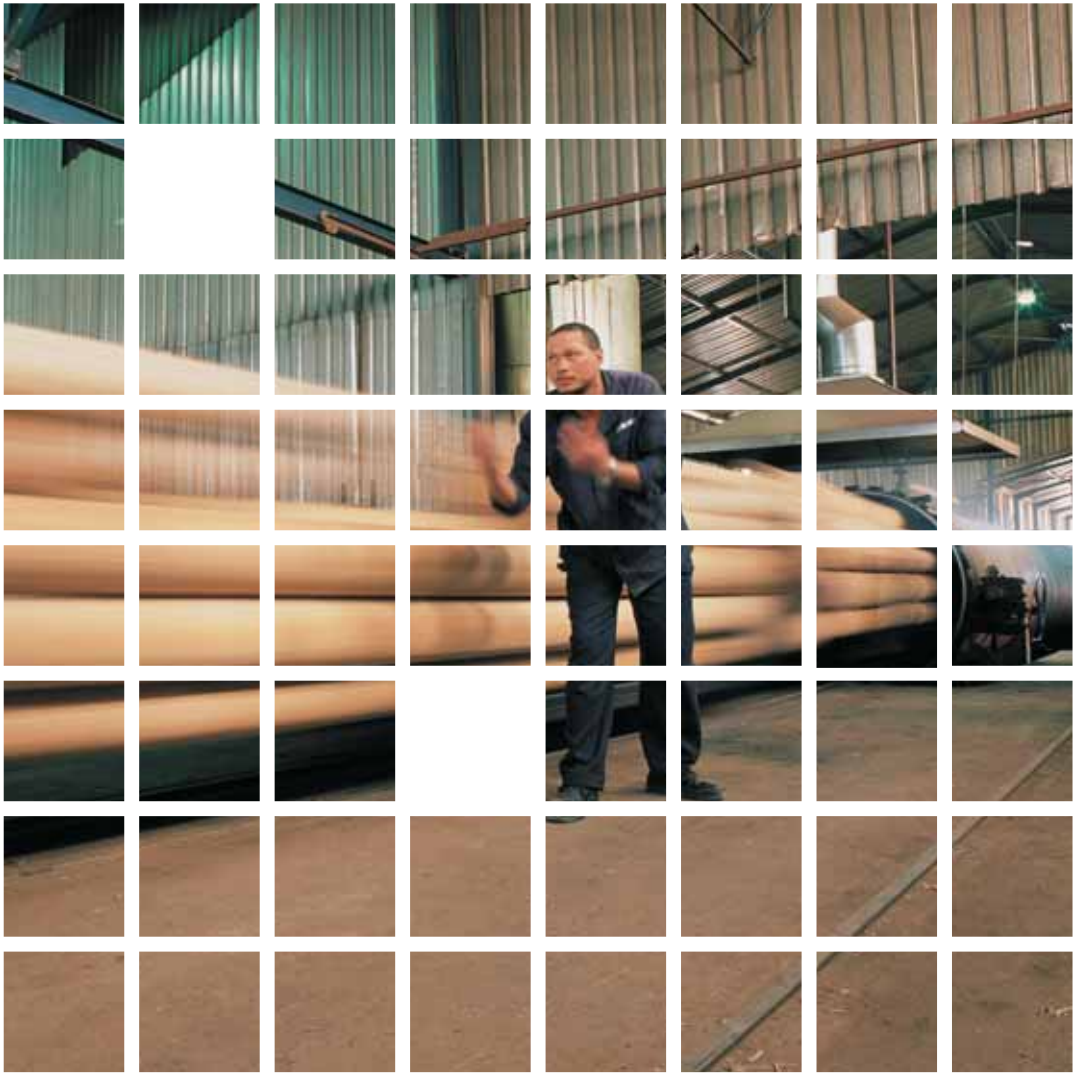
Timber board products are well known for their versatility and have various applications ranging from panelling, furniture and flooring to thermal insulation in buildings. The fibre inputs to timber board production are received from sawmilling wood residue and wood chips being the main source. In addition, fibreboard producers (Masonite and PG Bison) own their own plantations, which are used as a source of virgin fibre in the production process; other companies source virgin fibre from other plantations close to their production plants.

Within South Africa, the four main producers of timber board products are PG Bison, Sonae Novobord, Masonite and William Tell. PG Bison and Sonae are the only producers of MDF and Masonite is the only producer of hardboard and insulation board in South Africa. MDF is typically used in the furniture and joinery industry. Engineered medium density fibreboard blend the advantages of manufactured board with the natural properties of solid timber, allowing for the most traditional wood working techniques. Hardboard is used for exterior building cladding, panelling and furniture. Insulation board is used for cladding. Three domestic producers - PG Bison, Sonae and William Tell as well as a small number of importers supply the particleboard market. Particleboard is used extensively in shopfitting, kitchen manufacturing, domestic and office furniture industry amongst others. Imported timber board products are at a disadvantage to domestically produced boards, as imported boards are not always convenient in terms of delivery time. The furniture manufacturing industry, the largest user of timber boards, is cyclical, with much higher production in the second half of the year, reaching a peak in the last quarter of the year, where manufacturers have to operate optimally.

The export market for board products is subjected to production capacity of other world players and the variability of our exchange rate. A weaker Rand favours increased exports and vice versa. Timber boards are primarily exported to India, the rest of Africa, Europe and South America.

Domestically, timber board products are distributed through a large number of distributors (known as board resellers), who purchase timber board from the main producers or through imports, store the product in depots from where they supply the various users of timber board products. Furniture manufacturers such as the The Bravo Group and Montani purchase high volumes of timber board.

The timber board industry has very close ties to other producers in the forestry/wood product sector. The timber board industry sources its timber inputs from plantations and timber processors that produce wood residue (such as sawmills), and thus is directly reliant on the existence of domestic plantations.



Photograph courtesy of PG Bison

WOOD PRESERVATION

The science of timber preservation entails the treatment of wood to make it more durable and therefore extending it's service life. The treatment process involves the placement of preservative chemical, which is antagonistic to wood destroying agencies within the wood microstructure. These organisms are primarily wood destroying fungi, consisting of different forms of rot, staining fungi and moulds, wood borer – most common being European House Borer, subterranean and dry wood termites. Other organisms, which affect timber, are fire, for which fire retardant preservative treatments are available, and weathering,

Prior to the 1950's, most wood used in construction was untreated, as timber was sourced from durable, slow-growing indigenous species and imported softwoods, e.g. Douglass Fir (Oregon Pine). With the rising demand for timber in construction, mining and agricultural sectors, commercial planting of fast-growing exotic species was required. This is when commercial Pine was introduced into the market. These Pine species were not as durable as their hardwood predecessors, and offered little resistance to wood decay, fungi and insect attack. In 1945, the first commercial treatment plant was established to treat sawn timber. The Government of the day quickly moved to legislate for the compulsory treatment of timber along the coastal belt from Durban to Cape Town. More recently, this area has been expanded to include 67 municipal districts bordering the full length of our coastline.

There are a number of controlled industrial methods used in applying wood preservative, usually involving process plants to provide consistent accuracy of timber treatment. The most commonly used method is the pressure treatment process. The wood is placed in a heavy-duty pressure vessel, which is sealed off, then filled with preservative solution. A vacuum is drawn for a period of time to withdraw air from the wood cells. Hydraulic pressure is then used to apply the wood preservative, until a correct amount of solution has been absorbed into the wood. Then the pressure vessel is emptied of all the solution, and a final vacuum is drawn to create surface-dry, drip-free wood. This is a controlled process to ensure that the required amount of preservative is used to provide the correct level of protection.

Depending on the intended end–use, different preservative strengths will be used. These are thresholds, which have been scientifically calculated, and are referred to as Hazard Classes. The Hazard Classes range from H0 and H2 to H6. H2 for example will refer to wood that is treated to be used above ground and under cover, e.g. roof trusses, whilst H6 is the highest Hazard Class for wood used in marine water contact, e.g. jetties. Treated wood products range from sawn timber and engineered timber products to round pole products and these product requirements are specified in South African National Standards (SANS) developed and maintained with the SABS Standards Division. All preservative treated products sold in South Africa have to be certified to comply with the SANS Standards and the certification is done by either the SABS or SATAS, both of whom are approved accredited certification bodies.

All wood preservatives used in South Africa have to be registered with the Department of Agriculture, Forestry & Fisheries (DAFF). Wood preservatives are divided into three main groups.

1. Water-borne preservatives, applied in a pressure treatment plant are traditionally organic chemicals dissolved in water. The most commonly used is Copper Chrome Arsenic (CCA), which is a heavy-duty preservative offering a broad spectrum of insecticidal and fungicidal protection. New generation copper based products; Copper Azole and ACQ preservatives are now available in South Africa. Borate based wood preservatives are also available which offer milder protection for interior applications only.

2. Creosote is an oil-borne preservative, which is applied in an open or pressure treatment plant. It is a heavy duty preservative used primarily to treat wooden poles.

3. Light Organic Solvent Preservatives (LOSP), are named so because the term LOSP describes the solvent carrier of the preservative. This preservative is mainly used for timber mouldings and engineered wood products.

Photograph courtesy of D&A Timbers

WOOD IN CONSTRUCTION

Roof Truss Construction

The Timber Roof Truss Industry

The dangers of an ill-constructed roof can be devastating – both financially and from the perspective of the safety of those living under it. Apart from providing covering for a building, the main purpose of a roof is to protect the rest of the structure, regardless of whether it is a residential home or a large commercial structure. So it goes almost without saying that the roof of any structure is key in the building's design and it is arguably a building's most important structural aspect. Without a good roof, one that functions in a manner compliant to the overall building design and functionality, the rest of the building would be left to the mercy of the elements.

Unlike plumbing and electrical installations, alarmingly in South Africa, the Erector for the erection and installation of the roof trusses requires no certificate of compliance. The design and delivery portion of any roof project is well regulated and for the most part, these regulations are well implemented. The problems arise with the regulation and controlling of the actual erection of the pre-manufactured roof trusses. Timber roof trusses often get erected by unskilled labour – those who are not qualified in the erection of roofs – a point that can lead to disastrous results. The Institute for Timber Construction (ITC) is endeavouring to address shortcomings by introducing training facilities for roof erectors.

What can go wrong?

A successfully erected roof structure comprises three parts – temporary erection bracing, permanent bracing and restraint and connection details. The structure as a whole must be designed and installed to carry all the various loads. As the average residential roof measures approximately 250 m^2, it can weigh in the region of 30 tons. It is fairly clear that the structure must be designed and constructed professionally.

So who would be liable should disaster strike?

The engineer who signs the completion certificate in accordance with regulation A19 of the National Building Regulations and who ultimately signed the roof off will be liable if anything goes wrong with the roof (his or her personal indemnity insurance should help). The owner is responsible if he did not appoint an engineer. If negligence of the engineer is proven, the responsibility will almost certainly be placed squarely on the engineer's shoulders.

So what are the laws?

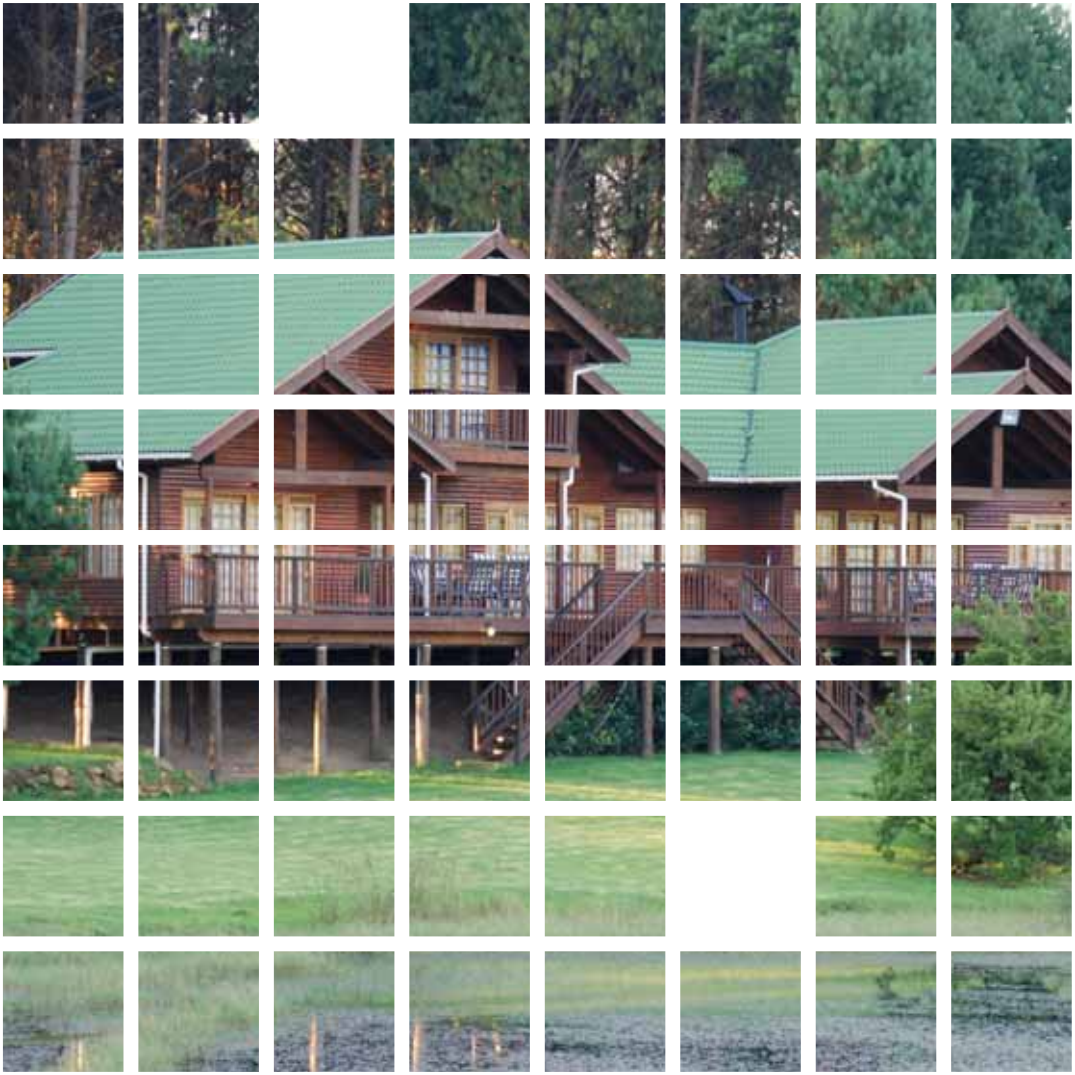
Roof truss designs are assessed in accordance with Part L of the National Building Regulations (SANS 10400). The legal mandate for the National Building Regulations (NBR) is the National Building Regulations and Building Standards Act (Act 103 of 1977). Part L of SANS 10400, comprises three parts, which are generic performance requirements for roofs – Part L1, L2 and L3. In L3, there is what is termed as "deemed-to-satisfy-requirements", which means that any roof design and construction that complies with the detailed technical design specifications and tables that are set out in the "deemed-to-satisfy-rules", will be considered to be in compliance with the necessary generic requirements. However, if a designer and/or fabricator of roof trusses wishes to design a roof that has structural design characteristics that differ from those set out in the "deemed-to-satisfy-rules", a competent person (an individual registered with the Engineering Council of South Africa), must certify that the rational design that has been employed, satisfies the requirements of Building Regulations L1 and L2.

Who are the players in the Roof Industry?

There are five key role players, who ensure that the industry delivers on its mandate to produce safe and properly designed roofing structures:

- System manufacturers who manufacture nail plates, develop and provide software trusses, for the design of nail plated timber roof play an important role in providing the wherewithal to manufacture roof trusses. In South Africa, the four leading roofing system manufacturers are Multinail Africa, MiTek Industries, Alpine Automation and International Truss Systems.
- Engineers with substantial experience and proven competence in timber engineering, provide the technical expertise to the industry.
- Timber Truss fabricators, who design, manufacture and supply prefabricated nail plated timber trusses to the desired standards.
- Companies that install and erect prefabricated nail plate timber roof structures.
- Professional roof inspectors, who are accredited by the ITC and aligned to an approved engineer, are able to inspect timber roof structures for compliance with the National Building Regulation A19.

The Timber Roofing Industry is a significant user of building timber, using more than 300 000 m^3 of structural timber in 2009.



Photograph courtesy of Cottage Concepts

Timber Frame Construction

Timber Frame History

Although timber buildings have been built in South Africa since the early 1800's (with many of them still in use today), it's only in the last 30 years that this form of construction has really become established. The early version of SABS 082 - the Code of Practice for Timber Buildings - was largely unknown amongst the very few timber builders that existed at the time. Many builders were building to the Gypsum Industries Agrément certificate for brick veneer in order to get building plan approval from their local authorities.

SABS 082 was upgraded in 1988 and then incorporated into the National Building Regulations. This really opened the way for timber frame building to become an acceptable construction method and coupled with the strong support of the Sawmilling and Timber Preservation sectors, the industry has grown in leaps and bounds since then, helped along by the formation and efforts of the Timber Frame Builders Association (TFBA) in the early 1980's.

A timber frame house presents the best example of all the main benefits of wood as a building material - packaged together perfectly. The carbon footprint of a timber frame home is extremely low compared to other building materials. Wood is a natural insulation material and optimises the thermal comfort of a building structure. Wood products will play a major advantage in determining the energy efficiency of buildings of the future. Timber frame buildings can be erected speedily, particularly if built in modular form, constructed with less impact on the surroundings and built more easily in steep and difficult to access terrain areas.

The Present

The actual percentage of the high-end top housing price category market that the timber frame construction industry has captured is estimated at 2%. This has been largely in the middle to top price range with very few timber homes being built for the lower end of the market. The Industry has extrapolated the following statistics:

The estimated total number of timber frame builders nationally is approximately 265. This translates into around 1 550 buildings of an average of 200m² each per annum. The market share value is therefore around R1.5 billion per annum.

Based on these estimates, the estimated timber and wood products usage is:

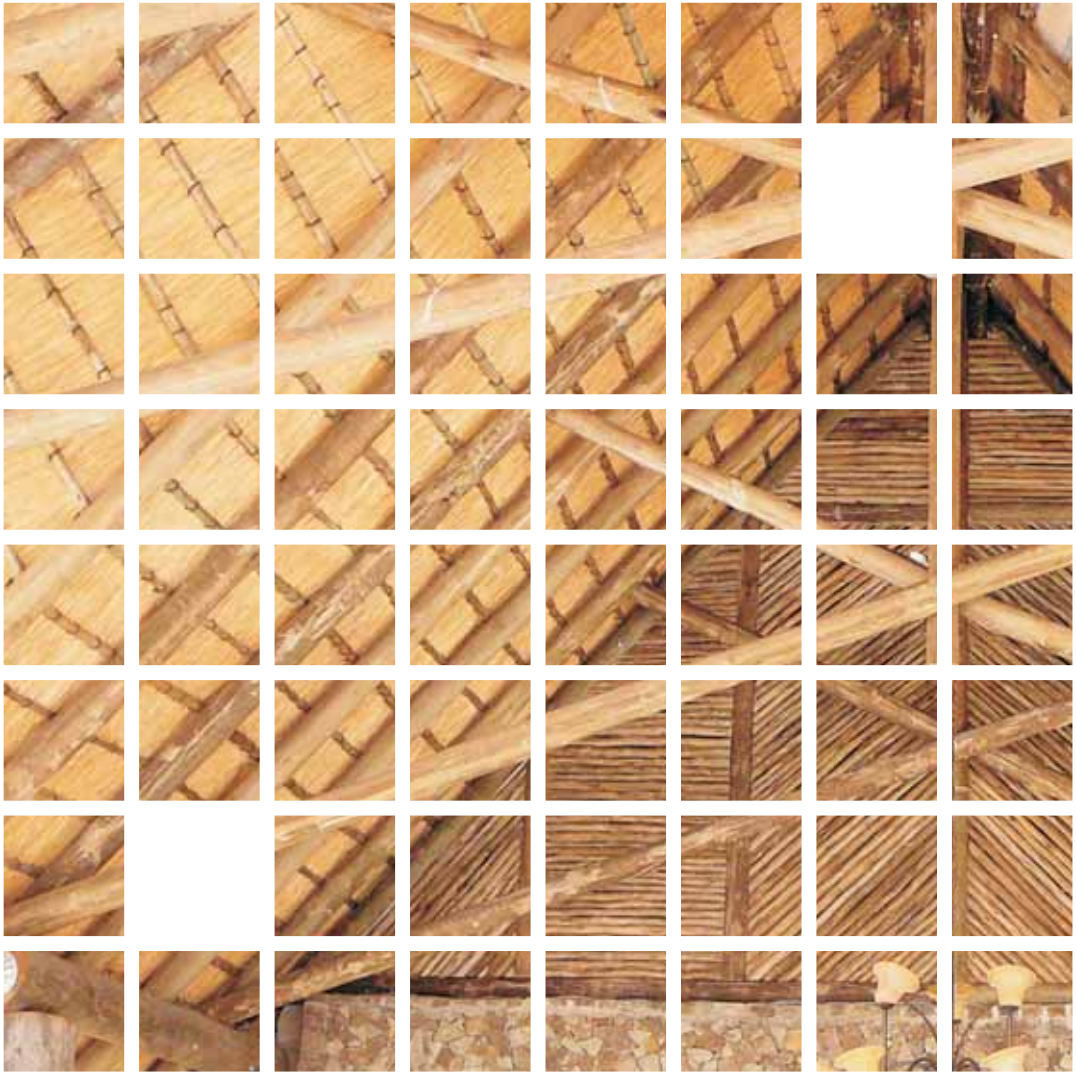
Structural timber	46 500m³p.a.
Flooring	375 000m²p.a.
Exterior timber cladding	300 000m²p.a.
Tongue & Groove, ceiling & panelling	325 000m²p.a.
Plywood / OSB boards	300 000m²p.a.
Mouldings & skirtings	400 000m²p.a.

The mass housing market has attracted some interest amongst a number of timber building contractors and material suppliers and there has been a lot of groundwork being done in recent years to cater for the substantial volumes that this market requires. The figures stated in the above statistics will increase appreciably once timber frame construction is fully accepted in this segment of the market.

The opportunities are very real in this segment and the TFBA has geared itself to provide approved training at its timber construction training facility in Paarl.

The Timber Frame Builders Association has recently aligned itself with the Institute for Timber Construction and has changed its name to the Institute of Timber Frame Builders. Both these organisations will together strive to promote timber construction and ensure that timber frame and timber - roofing structures are built to superior standards in South Africa.

With increasing focus on green building principles and reducing the carbon footprint of building structures, timber frame construction is poised to play a much larger role in the future of construction in South Africa.



Photograph courtesy of Biggarsberg Thatchers

Thatch Industry

With green design becoming more popular, there is more interest in thatching than ever before.

Thatching in South Africa is a fast growing industry, as more people look for natural alternatives in construction. Thatch has impressive green credentials, as a material, which is completely natural, with the lowest carbon footprint of all roofing materials due to its benign production process, which does not create pollution or damage the environment.

The myth that thatch roofing is much more expensive than tiled roofing has been turned on its head. Simply compare the cost of a thatch roof to that of a conventional tiled roof with all its various components such as trusses, roof tiles, ridging, guttering, ceilings, insulation, painting of ceilings and one will be pleasantly surprised.

There are many benefits to using thatch rather than conventional roof tiles. Thatch is a natural insulator for both heat and sound. With a roof pitch of 45 degrees, a great deal of extra loft space can be created. From an aesthetic point of view, a thatch roof fits naturally into the surrounding environment, and is very pleasing to the eye. Thatch roofs in South Africa have become an icon in marketing the South African experience to the international tourism market. Whenever reference is made to the Thatching Industry, often only the thatch comes to mind. The pole structure that forms the major component of the structure is seldom given a second thought. Much information is available regarding thatch - for instance the grass/reed species, lifespan, maintenance, history and occurrence internationally. Very little information is available regarding the design of pole structures, which is a specialist field.

Over the years, the market has seen the move from using creosote poles, to greater use of CCA and Boron treated poles (see the Timber Preservation Market section). Creosote poles have formed an integral part of a thatched roof's character from an appearance point of view. For many of us this brings back fond memories of childhood holidays in game reserves, or in the mountains. Initially in the early 1980's only creosote poles were available. Some clients believed that the creosote treatment acted as a repellent to keep insects away. With the growing popularity of CCA treatment, Thatchers were provided with more options. Boron treated poles are favoured by certain clients because of their natural colour as opposed to the green colour of CCA treatment, but do have draw backs in that they cannot be planted in the ground or be exposed to the weather, which does occur with certain aesthetically pleasing designs.

Poles used for thatch roof construction have to meet specific size, treatment and strength requirements for roofs to be of sound and safe construction. In years past, people would have made one of two negative comments about thatch roofs. One would be fire concern and the other, associated high insurance costs. With the development of fire retardant thatch treatments, and other fire protection systems, and research in both areas, fire risk is far more manageable. This has in turn resulted in far more competitive rates from insurance companies, which to a large extent have negated these concerns.

In building a thatch roof by combining the use of a thatch grass, and wooden poles, the prospective home owner can be rest assured that, in using two natural, and environmentally friendly building products, he or she is making a concerted effort in dramatically reducing the carbon footprint of their dwelling and creating a beautiful aesthetically pleasing home.

Photograph courtesy of SA Forestry magazine

DEPARTMENT OF AGRICULTURE, FORESTRY & FISHERIES

The mandate of the Department of Agriculture, Forestry and Fisheries (DAFF) expands to include all of these three sectors. Among other things, DAFF recognises the importance of sustainable rural economies, an approach that is shared throughout Africa, where agriculture is declared a prime sector for turning around the economic fortunes of our continent.

Forestry plays a major part in the lives of South Africans and is anchored in both the first and second economy. In the first economy, forestry is well developed, highly capital intensive and internationally recognised. This sector employs close to 70 000 people and contributes more than R6 billion annually to the South African economy. Forestry as a rural based activity contributes to rural development through employment and provision of economic opportunities in these areas.

The participatory forest management approach provides a platform for the communities to access basic resources such as fuel wood and medicinal plants for subsistence use.

Furthermore, in order to contribute to government's agenda of reducing poverty and creating employment, the sector has to grow. However, the context of the growth must be twofold. Firstly, the commercial sector needs to expand and continue to create more job opportunities, promote the participation of small-scale farmers into the market and provide a safety net for the poorest of the poor. Secondly, greater emphasis has to be placed on the second area of focus, i.e. promoting new entrants into the Industry. There is a realisation that this sector is facing a number of challenges, including access to land, financial resources and lack of dedicated extension support services. Some of the forested land in this country is under claim, whereas new land that has been identified as having the potential for forestation is mainly found in communal areas. The result is that a significant portion of forested land in this country could fall into the category of small - scale farmers or emerging forestry entrepreneurs.

To keep forestry production levels at the optimum level, these new role players will have to be supported financially, capacity wise and with dedicated extension support services. These are some of the key issues that the present government needs to look at as part of the long-term strategy for the forestry sector. This includes concrete ideas of how to deal with the transfer of assets and the land reform process, which present great opportunities for government to realise the key objectives for the sector, such as ownership, management and control and capacity building. In addition, the Forestry Charter provides for preferential procurement, which will favour the participation of small and emerging contractors in the sector. While we are encouraging the growth and transformation of the sector, we face the challenge of timber shortages in the country. The timber resource base (in terms of hectares) has remained static over the past 25 years. It has only been as a result of constant yield improvements in the growing of the timber that the forestry sector was able to increase the harvest from 10 million cubic metres in the early 1980's to more than 22 million cubic metres in 2008.

The demand for timber is expected to increase in the future. However, unless we find new improvements in technology, the yield gains will be very marginal. There is therefore an urgent need to increase the forest base by planting more trees to ensure that the current processing plants can function optimally. For this reason, the Department is promoting the forestations programme, which refers to the establishment of new plantations for growth and development purposes. In this regard most of the land that has the potential for forestation is found in the communal areas of KwaZulu-Natal and the Eastern Cape. This presents excellent opportunities for communities to be future owners of forestry businesses.

Photograph courtesy of SA Forestry Magazine

DAFF is the custodian of South Africa's forestry resources. It is primarily responsible for the formulation and implementation of policies governing the Forestry Sector.

Forestry is one of three Branches with three Chief Directorates, namely: Forestry Regulation and Oversight, Forestry Regions and Forestry Development. The main purpose of the Forestry Branch is to ensure the sustainable management of the country's forest resources in order to realise their optimal social, environmental and economic benefits. It addresses South Africa's framework for sustainable development, co-operative governance and participation of local communities in forest management as provided for by the White Paper on Sustainable Forest Development (1996), the National Forestry Action Programme (1997) the resultant National Forests Act (1998) and the National Veld and Forest Fire Act, (1998).

Forestry has been recognised as one of the key sectors with potential to contribute to poverty alleviation, and economic growth and development. As a result, Forestry is part of the National Industrial Policy Framework (NIPF), and the Accelerated and Shared Growth Initiative (ASGI-SA).

In line with the vision of the Department, the Forestry Branch has embarked on various programmes aimed at meeting the social and economic needs of the current and future generations whilst benefiting the environment. A brief description of the purposes of these programmes are provided:

1. **Forestry Oversight** develops policies to support sustainable forest management, oversees the sector and ensures that policies at all levels of government are coherent, including promotion of the Forest Sector Broad-Based Black Economic Empowerment (BBBEE) Charter through policy initiatives.

2. **Forests, Fire Regulation and Governance** ensures the administration of the National Forests Act, 1998 (Act No 84 of 1998), the National Veld and Forest Fire Act, 1998 (Act 101 of 1998) and supports rural socio- economic development through access and use of State Forests and developing systems and strategies for preventing, managing and monitoring veld and forest fires.

3. **Forestry Development** develops strategies that support the Forest Sector's Broad Based Black Economic Empowerment Charter and that enable communities to make use of tree and forest resources to improve their livelihoods.

4. **Forest Technical and Information Services** ensures sustainable use of the natural resource base through the management of the overall system for forestry data, information, and knowledge, including spatial and non-spatial forestry information. It also ensures access to forestry information by sector stakeholders and the gathering of forestry information by the regions.

5. **State Forest Transfer, Regulation, Administration and Oversight** deals with the transfer, and post-transfer administration and regulation, of State Forests and relations with stakeholders.

6. **Forestry Management and Support** funds efficient general administration and management support for the programme as a whole.

7. **Forestry Support Services** provides technical, financial and general administration support or regional forestry activities.

agriculture, forestry & fisheries
Department: Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

Directorate: Forestry Policy & Strategy
Tel: 012 336 7500
Email: SibongileMav@daff.gov.za
Web: www.daff.gov.za

FORESTRY SOUTH AFRICA

Tel: 033 346 0344
Email: forest@global.co.za
Web: www.forestry.co.za

ITC SA
Institute for Timber Construction

Tel: 011 974 1061
Email: enquiries@itc-sa.org
Web: www.itc-sa.org

SAUPA
South African Utility Pole Association

Cell: 083 627 6897
Email: pierre@saupa.co.za

Sawmilling South Africa

Tel: 044 343 1720
Cell: 083 679 2457
Email: southeys@iafrica.com

SAWPA

Tel: 011 974 1061
Email: sawpa@global.co.za
Web: www.sawpa.org.za

THATCHERS ASSOCIATION OF SOUTH AFRICA
DENKERSVERENIGING VAN SUID-AFRIKA

Email: admin@sa-thatchers.co.za
Website: www.sa-thatchers.co.za
Cell: 083 283 8429

TIMBER FRAME BUILDERS
ITC SA
Institute of Timber Frame Builders
"The Seal of Controlled Quality"

Tel: 021 845 4435
Email: info@tfba.co.za
Website: www.tfba.co.za

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THE WOOD FOUNDATION™

The Wood Foundation, P.O. Box 686, Isando 1600. Tel: 011 974 1061. Fax: 011 392 6155. E-mail address: info@thewoodfoundation.co.za
www.thewoodfoundation.co.za

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