

Food and Agriculture Organization of the United Nations

Forest Products and Statistics Team

Argentina wood-based housing and construction – State of the industry and surrounding policies

A pilot study

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Acronyms and Abbreviations

ACSF	FAO Advisory Committee on Sustainable Forest-based Industries
AFOA	Argentina Forestry Association
CerFoAr	Forest Certification Argentina
CIRSOC	Centro de Investigación de los Reglamentos Nacionales de Seguridad para las Obras Civiles
CTA	Certificate of Technical Aptitude
DGEyC	Dirección General de Estadística y Censos
EMOICQ	École des métiers et occupations de l'industrie de la construction de Québec
FAO	Food and Agriculture Organization of the United Nations
GCBA	Gobierno de la Ciudad Autónoma de Buenos Aires
GEMA	Grupo de Estudio de Maderas (of the UTN)
IERIC	Instituto de Estadística y Registro de la Industria de la Construcción
INDEC	Instituto Nacional de Estadística y Censos
INTA	National Institute of Agricultural Technology
INTI	Instituto Nacional de Tecnología Industrial
IRAM	Argentine Institute of Standardization and Certification
SICyTAR	Information System for Science and Technology of Argentina
UNFCCC	United Nations Framework Convention on Climate Change
UTN	Universidad Tecnológica Nacional de Uruguay

1 INTRODUCTION

1.1 Background

This study was undertaken to support the 2017 recommendations of the FAO Advisory Committee on Sustainable Forest-based Industries (ACSFI) to the FAO, on leveraging work on promoting wood-based construction, and analyse the policy processes that underpin the sector's development in selected member countries.

Argentina was selected for this pilot study for its recent broad-based political consensus to start invigorating its wood-based construction, based on sustainable forest management (SFM) of planted forests in particular, and with support mechanisms aimed at mobilizing the forestry and wood processing sector to serve the pressing housing needs in Argentina.

The study includes:

- a) A description of Argentina's Housing Industry
- b) A description of Argentina's Government Housing Projects Based on Wood Construction
- c) A plan for Analysis of Argentina's Wood Construction Policies and Legislation

At the same time, it is aimed at exposing linkages to the Sustainable Development Goals (SDG), more precisely looking at in Argentina's forest sector possibilities to:

- integrate Sustainable Forest Management (SFM) policies and tools to increase climate resilience and integrate climate change measures into national policies, strategies and planning (SDG 13.1/2);
- contribute to renewable energy policies (SDG 7.2);
- enhance SFM to reduce the degradation of natural habitats and loss of biodiversity (SDG 15.5);
- encourage the private sector companies to adopt sustainable practices and higher resource efficiency, i.e. Responsible Consumption and Production (SDG 12);
- support the transition towards inclusive bio-economy through SFM based value chains, decent work and decoupling economic growth from environmental degradation (SDG 8.4);
- help making cities and communities more resilient (SDG11).

The Government of Argentina, together with the forest-based industries, banks and R&D and academic institutions, signed a ground-breaking strategy in 2016 to promote, finance, and fast-track the design and construction of at least 100,000 wooden houses through value chains from sustainable forest management (SFM), and scaling up the good practices to alleviate the housing crisis in the coming years. Another 300,000 houses will be built of other materials under the same scheme.

Argentina has a serious housing backlog which is estimated 3.5 million units. Out of this total 1.5 mill. needs to be newly built, and 2.0 million renovated (<http://www.telam.com.ar/notas/201603/138760-deficit-habitacional-argentina.html>). The most pressing needs are in facilitating the affordable family housing segment in different parts of the country. Argentina's planted forests (1,2 mill. ha) have been developed and are now growing well under intensifying management and favorable natural conditions. In pine and eucalyptus plantations Argentina is reaching excellent annual growth rates which fall only slightly second to those in Brazil. Argentina's sawmilling and panel industries grow especially fast in 2011-2012, and the sector has become a dynamic force for development in the key forested provinces like Buenos Aires, Misiones and Corrientes. Argentina has important but yet under-utilized comparative advantages for forest production from its forest plantations and 50 million hectares of native forests, as duly recognized in Law 26.331, placing importance both on their economic, social, cultural and environmental values.

1.2 Objective of the Study

The objective of this study is to provide the necessary background information for the follow-up work on Argentina's Wood Construction Policies and Legislation. This report contains first a short description of Argentina's industrial forestry sector which provide a necessary scale and context of the wood value chains. The main purpose of following chapters is to provide the FAO with sufficient information on Argentina's housing sector (Chapter 2), the government's on-going support systems in the construction sector, and basic data on the national value chain, policies and standards (Chapter 3), for concluding on the proposed plan for analysis (Chapter 4).

1.3 Approach and sources of information

Linkage to Argentina's commitments with the Paris Climate Agreement

The Paris Agreement adopted by COP 21 of the UNFCCC in November 2015 reconfirmed in Article 5 the need for Parties to take action on “policy approaches and positive incentives for activities relating to reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries; and alternative policy approaches, such as joint mitigation and adaptation approaches for the integral and sustainable management of forests, while reaffirming the importance of incentivizing, as appropriate, non-carbon benefits associated with such approaches” (UNFCCC 2015).

The study is based on existing information in various published reports, articles and studies in Argentina, and includes also some inputs from several fieldwork interviews that were carried out earlier among the key wood industries and associations. The information reviewed included national and sectoral statistics, policies and other documentation, studies carried out under different projects, and lessons learned from earlier efforts to promote forest-based value chains in Argentina.

A key publication that has been consulted is Informes de Cadenas de Valor, by the Secretaría de Política Económica y Planificación del Desarrollo, published in 2016. The statistical information in this report has been put together by the Ministry of Agro Industry - Undersecretariat of Forest Industrial Development; Ministry of Labor, Employment and Social Security and Employment Dynamics - Observatorio Empresarial; the Ministry of Science, Technology and Innovation - Undersecretary Institutional Evaluation, National Programs and Projects, SICyTAR Information System for Science and Technology of Argentina (SICYTAR) and the National Scientific and Technical Research Council (CONICET).

A key Regulation on the structural use of wood was adopted on 3 Nov. 2016 by a Government Resolution: Reglamento CIRSOC 601-2013 Argentine Regulation of Wooden Structures.

The Consultant would like to thank the Argentina Forestry Association (AFoA) as the planted forests sector association for their valuable support in organizing data support and interviews in Argentina.

2 ARGENTINA'S PLANTED FORESTS AND WOOD PROCESSING INDUSTRY

2.1 Planted forests

Argentina has 1,2 million hectares of planted forests. The provinces of Corrientes and Misiones dominate the planted forest resource of Argentina with areas of 373,000 and 352,000 hectares, respectively accounting for 31% and 29% of the national total (Figure 1). Abundance of planted forests is a result of a national policy incentive for afforestation primarily amongst small and medium producers. From the mid-1990s, the forestry sector in the country experienced a significant growth, driven by legislation to promote forest plantations, coupled with broad agro-ecological advantages for afforestation.

Pines (*P. taeda*, *P. elliottii*, *P. caribaea*) are the predominant species both in Misiones and Corrientes, while eucalyptuses (e.g. hybrids of *E. urophylla* & *E. grandis*) are most common in Entre Rios. *Salicaceae spp.* (poplars and willows) are concentrated mainly in northern Buenos Aires and southern Entre Rios. *Araucaria* used to be the superior natural wood for construction in the past, but today it has become a small part of the market, as a high-value niche timber.

Wood from planted forests covering most of the demand for raw material for forest-based industries, while removing pressure on native forests. For these reasons the State supports forestry through Law No. 25,080 Investments in Forestry in Planted Forests.

The genetically improved planting material developed in the country allows exceptional growth, unsurpassed elsewhere in the world. The high average productivity of cultivated forests in Argentina allows short rotations (12-28 years for pine, 9-14 years for eucalyptus, poplars 10-15 years).

2.2 Forest Industry

Most sawmills, remanufacturing plants and wood-based panels mills are close to the of supply clusters of raw materials (Figure 1). Activities involving greater added value (furniture and paper) are located in major urban centers (Buenos Aires, Santa Fe and Cordoba). Most of them are micro enterprises and SMEs, with the exception of a few large sawmills oriented to primary and secondary processing, and wood-based panels manufacturers.

The secondary transformation of solid wood comprises remanufacturing into wood profiles, blanks, blocks, finger-jointed planks and panels, mouldings, strips, machimbres, and housing-related building products (windows, doors, floors), and wooden furniture manufacturing and parts.

In pulp and paper, Arauco Argentina is by far the largest company. It belongs to the group Celulosa Arauco y Constitución and is one of the largest forestry companies in Latin America.

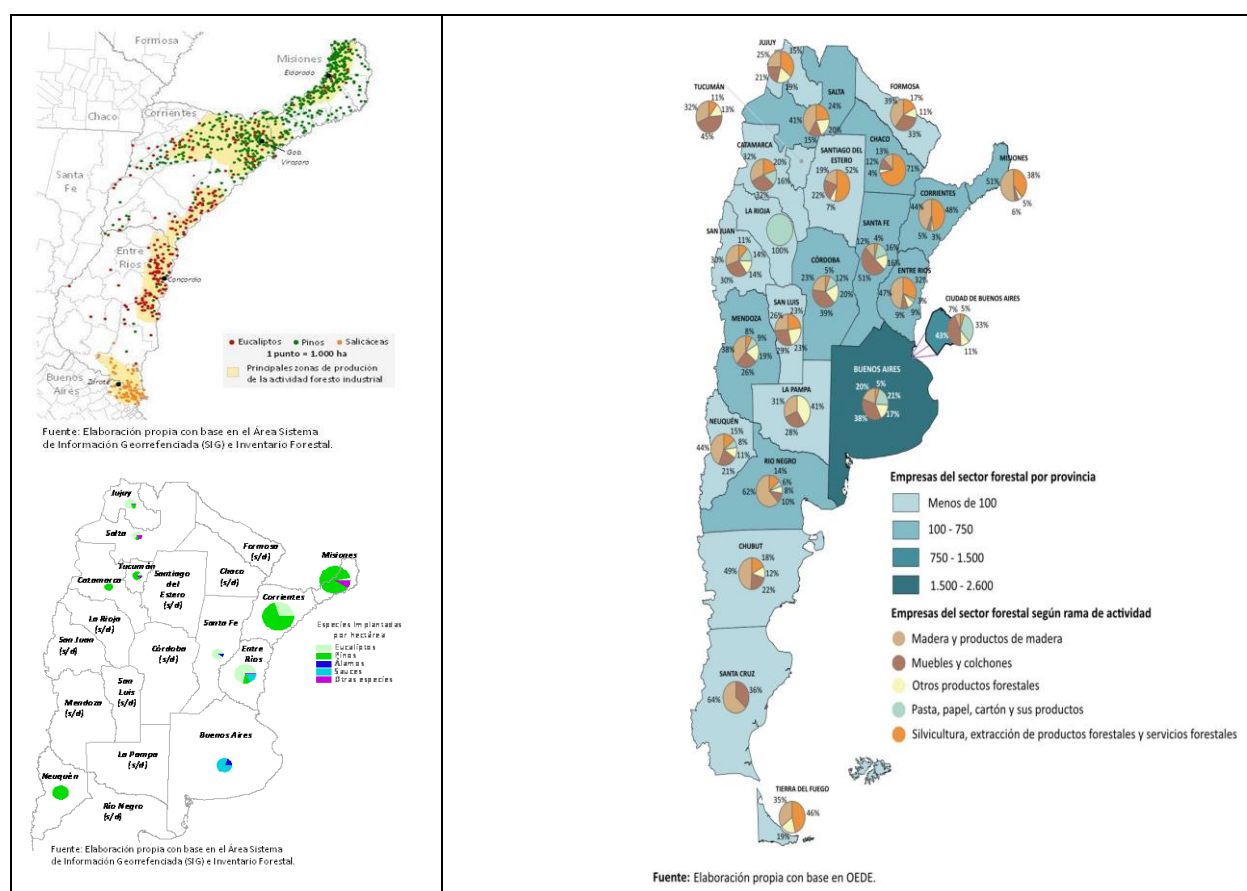
2.3 Forest Certification

In native forests (made of *Prosopis spp.*, *Melia spp.*, *Toona spp.*, *Grevillea spp.*, *Paulownia spp.*, etc.) the emphasis will be maintained in conservation of biodiversity and the environmental services, while the planted forests have clearly been positioned as a source for economic development.

Argentina Forest Certification (CerFoAr) is a standard of the Argentine Institute of Standardization and Certification (IRAM), which establishes the principles, criteria and indicators for sustainable forest management with respect to native forests and cultivated forests. This system arises as a need for a tool that encourages sustainable management of native forests and national planted.

CerFoAr certified products use the PEFC seal to communicate their commitment to sustainability internationally, facilitating the access of Argentine forest products to the international market. Argentina is the fourth Latin American country that has a national forest certification system approved by the PEFC, along with Brazil, Chile and Uruguay.

Figure 1. Planted forests and processing industries by province in Argentina



Source: Informes de Cadenas de Valor, Secretaría de Política Económica y Planificación del Desarrollo, 2016

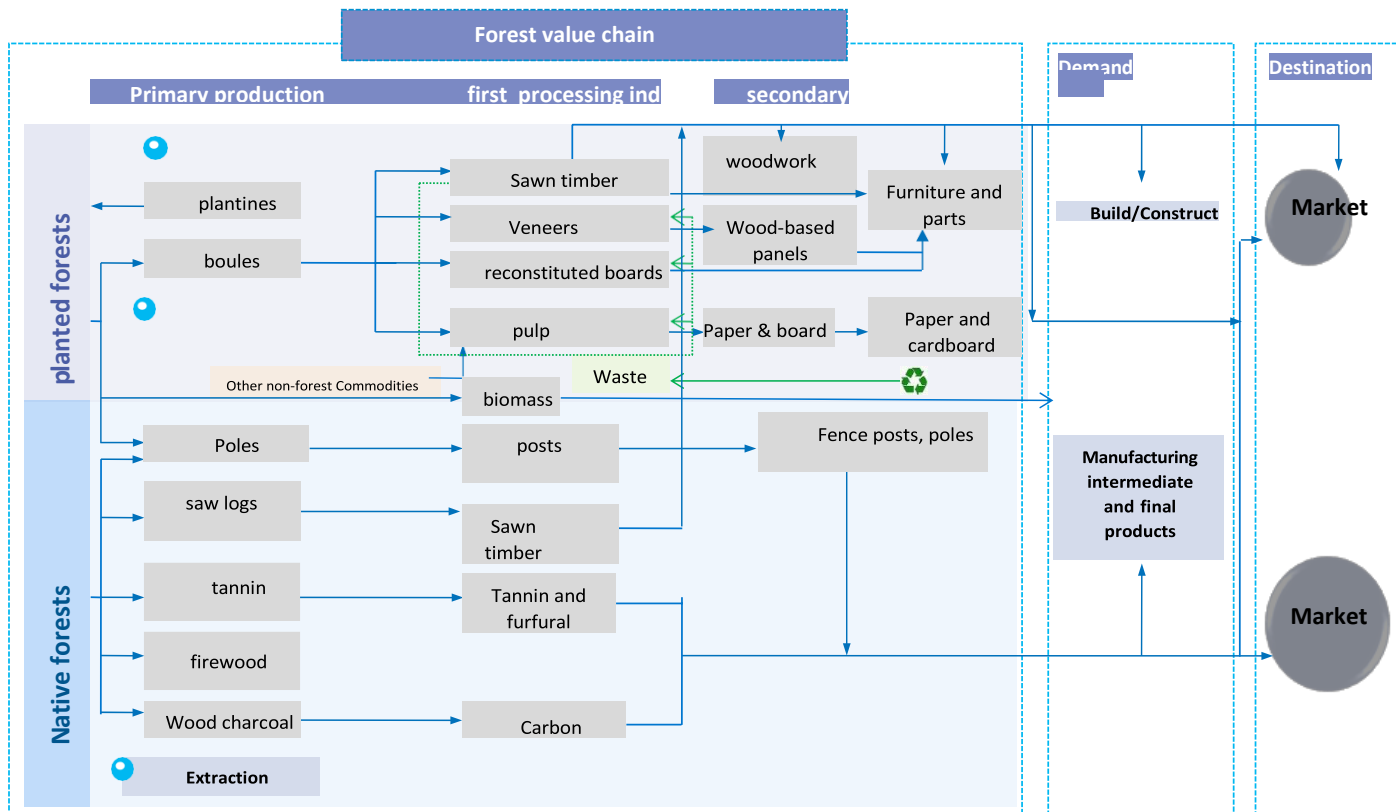
3 DESCRIPTION OF ARGENTINA'S HOUSING INDUSTRY

3.1 Forest Value Chain

Figure 2 explains the nation-wide industry structure and the major forest product value chains in Argentina. Majority of construction-related wood products come from the planted forests (the top part of the graph), and are predominantly of pine and to a lesser degree of eucalyptus and some native hardwoods. The secondary transformation of wood is directly feeding into the housing sector, either through contractors' procurement of wood products for construction, or sales of interior finishing, furniture, and builders' joinery and carpentry. The third, growing segment is the pre-fabricated housing manufacturing, which is poised to expand if the ambitious housing programme (PROCEAR) will reach its target.

The range of secondary processed wood products is aimed at both for structural purposes (laminated and finger-jointed square logs, beams and columns, trusses, suspenders, edge-glued flat panels, prefabricated wooden house kits, etc.), and for appearance products (doors, wall and ceiling panelling known as machimbres, wood slats, lists and strips known as listones, stairs, finger-jointed mouldings, skirtings and components). Araucaria used to be a prime species for 12 meter long straight beams in wood construction, but today laminated beams of finger-jointed pine have substituted it.

Figure 2. Forest value chain in Argentina



Sources: Ministry of Environment and Sustainable Development, Ministry of Agroindustries

3.2 Economic importance and employment in the forest sector

According to the Observatory of Employment and Business Dynamics of the Ministry of Labor, Employment and Social Security of the Nation (MTEySS), 95.885 registered employees worked in the branches of the forestry and industries in the third quarter of 2015, representing 1.5% of national employment. The informal employment (direct and indirect) is estimated at least 26% of the total labor force, or about 500,000 people around the country.

The companies in the sector are mainly SMEs (a number of 7.500 with different levels of processing). It is the engine of growth for many regional economies, for example in Misiones represent more than 50% of its Gross Domestic Product. Around one billion dollars of export revenue is coming from the forest-based products. Argentina was on the 25th place in lumber production in 2014, by providing 0.8% of the world total, and on the 51st place among world exporters.

3.3 Economic importance and employment in the construction sector

Construction produces 3.2% of the national GDP. The residential construction sector had boomed in recent years, but it has more recently suffered from certain foreign exchange currency restrictions in force in Argentina. Also the high inflation (about 20-25%) is a challenge for the housing market, and it is becoming the main concern for developers of real estate projects. As a result of an increase in the price of land and in the cost of construction, investment in the residential sector has considerably decreased over the last months. Projects are further financed through the pre-sale of units: this system is used for residential, office and hotel projects in particular.

Industry growth over the forecast period (2016–2020) is expected to remain subdued, recording a CAGR of 0.55% in real terms. The government's efforts to provide affordable housing to the country's low income population will support growth in the industry.

Under the new national housing program PROCREAR, the government seeks to provide financial assistance to the low and middle class population for purchasing new or renovating existing houses up to the value of AR\$1.5 million. The initiative is expected to boost construction activity in the residential market for the next ten years.

3.4 Construction industry

Activity of the construction industry has overall been depressed in 2015-2016 (Figure 4). IERIC (Instituto de Estadística y Registro de la Industria de la Construcción) collects areas of new construction permits for the 40 major cities and municipalities and the autonomous city of Buenos Aires and produces a compound quarterly index of permit area development. City of Buenos Aires has fared better than the rest of the country, but in all areas there was a clear slump in the first and second quarter of 2016. There was a recovery again in 2017, and prospects for 2018 were for a renewed growth.

There were 23,160 construction companies (inc. their sub-contractors) in Argentina at the end of 2016. More than one third of them were in the province of (7,345), and in the autonomous district of (4,302), Buenos Aires, which is the main economic powerhouse of the nation (Figure 3).

Santa Fe (2,055) and Córdoba (1,658) had the other two major concentrations of construction companies. These four major jurisdictions held 15,360 companies, or 66% of the total. The rest were spread into the 20 other provinces of Argentina.

Wooden construction is a minor part of their activity, and there are some concentrations of prefabricated wood house manufacturers and companies building with traditional or North American wood frame techniques in some of the forest-rich provinces (e.g. Corrientes, Misiones, Entre Rios, etc.). Some dedicated pilot wood villages are in planning and construction phases (e.g. Concordia, Entre Rios).

Figure 3. Construction companies by province in Argentina (Dec. 2016)

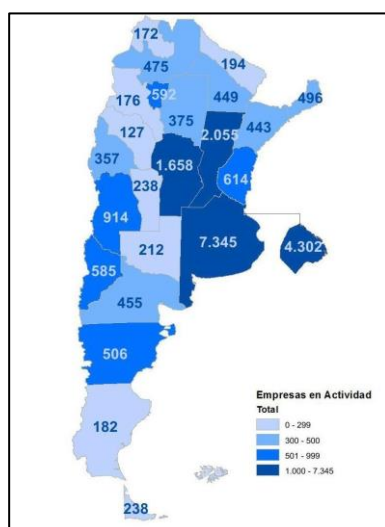
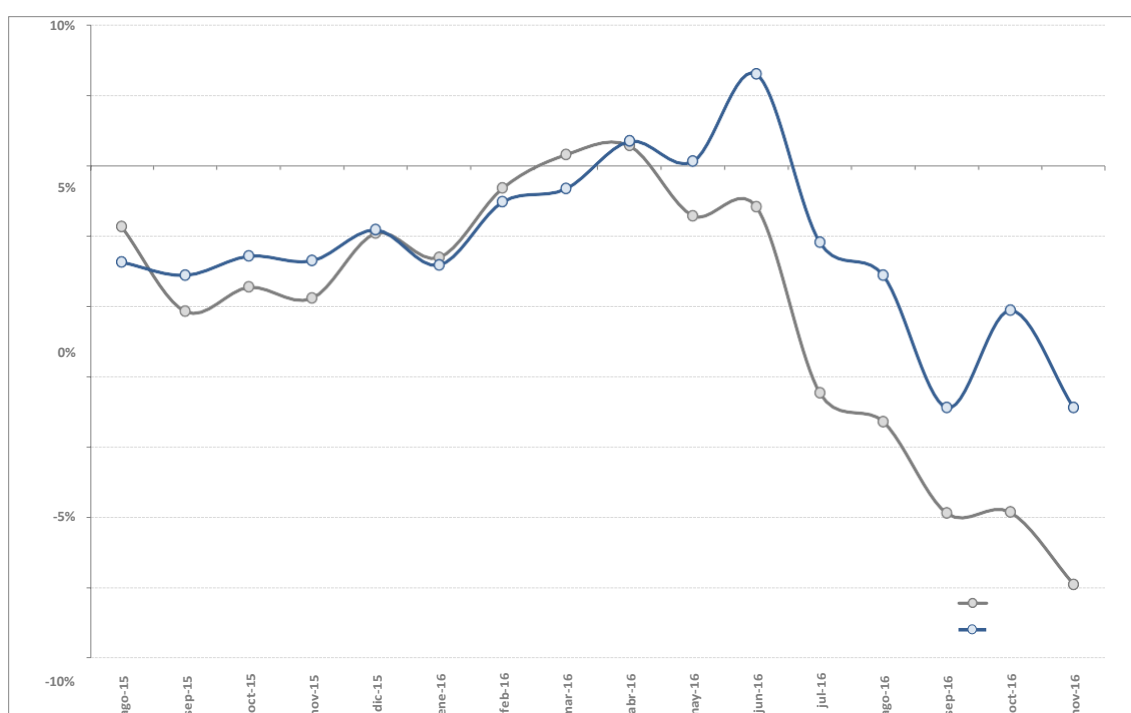


Figure 3. Construction area permits in 41 major cities/municipalities in Argentina (2015- 2016)



Source: IERIC from data of INDEC and DGEyC (GCBA)

Note: top line includes the city of Buenos Aires, lower line includes the other 40 main cities/municipalities

3.5 Construction sector performance

The years 2014-2016 have been difficult in Argentina's construction industry. Instituto Nacional de Estadística y Censos (INDEC) reported that the area and number of new building projects peaked in 2011 (72,762), with a surface area of 20,6 million m² (Table 1). Permit numbers declined by 12% to 2014, and areas went down by 23%.

In the city of Buenos Aires, the cyclical downfall of completed construction area was significant after the peak of 2011 (1,8 million m²), when area came down by 43% to 2014 (1,03 million m²), and crashed to less than one third in 2016 (0,57 million m²) (Table 2).

Table 1. Number and area of new building permits in Argentina by type (2011-2016)

Type of Construction	Unit	2010	2011	2012	2013	2014
Permits						
New Buildings	Number	40,401	48,528	41,079	39,025	40,039
New Extensions	Number	23,772	24,234	24,326	23,109	23,710
	Total	64,173	72,762	65,405	62,134	63,749
Area						
New Buildings	1 000 m ²	12,203	16,516	12,504	11,253	11,816
New Extensions	1 000 m ²	4,126	4,128	4,209	3,788	3,978
	Total	16,329	20,644	16,713	15,042	15,794

Source: INDEC. Estadísticas de la Construcción

Table 2. Area of construction completed in Buenos Aires (2011-2016)

	2011	2012	2013	2014	2015	2016
	1 000 m2					
Buenos Aires	1,803	1,419	1,146	1,032	0,771	0,570

Source: Estadística y Censos, Buenos Aires Ciudad

4 DESCRIPTION OF ARGENTINA GOVERNMENT HOUSING PROJECTS BASED ON WOOD CONSTRUCTION

4.1 Introduction

Argentina has established a highly productive plantation forestry with high-growth tropical pines and eucalyptuses. The resource base would be sufficient for large-scale international investments in pulp and paper industry, but the persistently high political and economic risks have been impediments for any such venture to materialize. The government, convinced by the AFoA representing the plantation forestry, has decided to initiate an investment programme to support mechanical processing of the sustainable and growing wood supply into housing and construction. This is to ease the pending shortage of affordable housing, in particular.

The following chapters explain the various support mechanisms that are aimed at mobilizing the forestry and wood processing sector to serve the pressing housing needs in Argentina.

4.2 ANSES

Multiannual Federal Programme by ANSES is promoting and enabling affordable housing construction. It aims to solve problems of associated with urban growth, employment, social inclusion and equity. It intends to reduce the existing housing deficit in the country by facilitating access to decent housing and different basic infrastructure solutions across Argentina. The multi-year program is aimed at middle-income segments of the population who lack access to mortgage credits in the formal market. With the contribution of funds from ANSES his gap will be bridged.

The objective is to incorporate new, additional resources for housing financing, thus maximizing the contributions to mitigation of housing deficit, and maintaining the economic dynamics of the construction sector. A financial trust is constituted, for making contributions the Housing Institute and / or the Municipalities. The beneficiaries reimburse the value of their homes in monthly installments pay back their loan.

Agencies who are involved include Ministry of Federal Planning, Public Investment and Services of the Nation; Institute of Housing of the Province of Buenos Aires; and Municipalities of the Province of Buenos Aires. The Housing Institute develops and makes available to the municipal technical teams various prototypes of housing, assisting them technically in their development and in formulating urban development projects.

4.3 PROCREAR

On August 4, 2016 the PROCREAR was announced as nation-wide agreement on the promotion and financing of constructing more housing with wood. Its official name is PRO.CRE.AR or *Programa de Crédito Argentino del Bicentenario para la Vivienda Única Familiar*. The signatory parties were the Ministry of Agribusiness, the Ministry of the Interior, Public Works and Housing, and the Ministry of Interior (the Secretariat of Housing and Habitat), along with around 50 other members representing the national government (Ministries and

National Housing Council (CNV), banks, workers' unions, trade unions, chambers of commerce and industry, and provincial bodies.

A large number of Adherent Parties have also signed for PROCREAR, to give it the depth and effectiveness to stimulate the wood housing segment in the country. These include e.g. ANSES (Social Security Agency of Argentina), the National Mortgage Bank, Argentine Wood Industry Federation (FAIMA), AFOA, and 14 other provincial or national associations representing the private sector.

Parties are committed to generate a stable framework of collaboration with the aim of promoting the development of construction techniques and systems for housing with wood and incorporate added value to the products and by-products that are used. PROCREAR is encouraging the using wood for not only structural purposes but also in the builder's joinery and carpentry, and furnishings. The previous requirement of having a Certificate of Technical Aptitude (CTA) to build wooden houses, or process mortgages, will be eliminated, thus moving way one technical barrier. Wood is going to be treated *on par* with other materials, which implies a big step to simplify the procedures of using forest resources from planted forests for housing and construction.

The main Clauses of PROCREAR are committing Members to *inter alia*:

1. Create a Wood Construction Roundtable, with the purpose of consolidating a space where the general guidelines aimed at establishing and consolidating the construction with wood are discussed;
2. Promote construction with wood, dictate normative frameworks, and support the creation of training programs in provinces, municipalities and in the Autonomous City of Buenos Aires.
3. Constitute a Special Commission on Monitoring the actions that are adopted within the framework of PROCREAR.

4.4 Activities by different parties in wood construction programmes

The following Text Box 1 describes the commitments that PROCREAR assigns to its members and adhered parties in developing the Government-led public-private wood construction programmes in different parts of Argentina. It is a ground-breaking agreement with a profound commitment and participation.

4.5 FONAVI National Housing Fund

In order to support PROCREAR's financing, the Government is authorizing to use money from the National Housing Fund (FONAVI) to build new homes and schools with wood. The use of wood as a material was one of the issues addressed during the recent meeting of the Forest Bureau, made up of representatives from the private sector and from different areas of national governments and forest provinces. APICOFOM - a chamber of entrepreneurs from the southern Misiones and northern Corrientes - indicated that good progress is being made so that at least 10% of homes financed by the government use wood as their main material.

Nationwide, the housing institutes from 14 provinces have signed agreements on, and authorized money from FONAVI to be spent, in building with wood. Using wood as a construction material in the bidding documents of school projects will also be included.

Provincial banks such as the Banco Nación in Misiones accept now mortgages for the purchase of wooden houses, with terms similar to masonry houses, and with financing up to 30 years. There are seven adherent banks to support financing under FONAVI and PROCREAR.

Text Box 1. PROCREAR Programme: a nation-wide commitment to support wood housing

MINISTRY OF INTERIOR, PUBLIC WORKS AND HOUSING THROUGH THE SECRETARIAT OF HOUSING AND HABITAT, COMMITS TO:

1. Declare a traditional construction system of the Wood-frame platform;
2. Incorporate other constructive systems with wood;
3. Promote wood houses both in the private and in the public market;
4. Carry out training in the subject to the Provincial Institutes of Housing;
5. Build at least 10% of the houses financed by the Undersecretary of Urban Development and Housing with wood.

MINISTRY OF AGRIBUSINESS COMMITS TO:

1. Evaluate the contribution of the industrial forestry chain, from the primary phase to the construction of housing, in the mitigation of greenhouse gas emissions;
2. Prepare a bill with fiscal incentives for afforestation and the transformation industry;
3. Continue collaborating in the elaboration of a Technical Manual of Habitability and Durability complementary to the Argentine Regulation of Wooden Structures CIRSOC 601, in order to establish the adequate normative framework to position the construction of houses with wood at the same time as the other constructive methods in efficiency and quality;
4. Support the actions of promotion and dissemination that by their own initiative or of interested sectoral entities, allow to install the construction of wooden houses between the different actors and the community in general.

MINISTRY OF PRODUCTION:

1. Makes the industrial forestry sector as a priority sector in the Provincial Productive Agreements on strategic sectors;
2. Foster the creation of new companies;
3. Remove structural obstacles to production.

NATIONAL INSTITUTE OF INDUSTRIAL TECHNOLOGY (INTI):

1. Develops the Normalization, Standardization, Certification and Training on the systems and construction elements with wood, to ensure the quality of the product throughout the entire value chain;
2. Elaborate a Guide for the Project of Wood Structures with Low Structural Commitment, in base to the Argentine Regulation on Wooden Structures CIRSOC 601.2;
3. Collaborate in the elaboration of a Technical Manual of Habitability and Durability, complementary to the Regulation on Wooden Structures CIRSOC 601.3;
4. Conduct audits, quality control on site and verification of bidding specifications;
5. Develop a Service Center for the Wood Industry in Virasoro, Province of Corrientes.

THE ADHERENT PARTIES COMMIT TO:

1. Undertake to expand the use of the wood in the construction;
2. Promote wood-constructed neighborhoods in different regions of the country;
3. Develop an intense marketing campaign nationwide to expand construction systems with wood;
4. Encourage the implementation, updating and compliance with standards and other regulations in force;
5. Participate in the Sector Forums actively;
6. Promote the continuous training of collaborators, middle managers and businessmen;
7. Promote the development of the value chain of the housing industry;
8. Periodically disseminate a detailed list of wooden home suppliers in each region of the country;
9. Deliver a list of wood construction projects already developed throughout the country, indicating their main characteristics and progress;
10. Present periodically new construction projects with wood for development in each province;
11. Present an investment plan with commitments and amounts to invest, subject to the creation of the legal, tax, credit and financial frameworks.

5 ANALYSIS OF ARGENTINA'S WOOD CONSTRUCTION POLICES AND LEGISLATION

5.1 Rationale

The time is appropriate for producing a comprehensive analysis of Argentina's policies affecting wood construction. First of all, the country has over the past year stepped up a growth phase in its forest resources and an upside potential of their economic utilization. Secondly, the long-lasting promotion of the synergies between forest-based industries and the local economic development through housing and construction sector has been better acknowledged on the highest political levels. Thirdly, the SDGs offer a clearer political motivation and a development framework for sustainable development, and linkages of the forest sector in achieving them.

Some of the initial assessment on the policy frameworks that should be further explained in a detailed study to the FAO ACSFI are discussed in the following chapters.

5.2 Forest Policy in Argentina

Forestry sector administration at the national level is divided between three main bodies:

1. The Ministry of Environment and Sustainable Development, which is the highest authority for the implementation of environmental issues with national responsibility for the protection, conservation, recovery and sustainable use of **native** forests.
2. The Under-Secretariat of Forest Industrial Development under the Ministry of Agriculture, Livestock and Fisheries of the Ministry of Agro Industry, which covers **planted** forests.
3. The National Parks Administration (APN), a decentralized body under the Ministry of Environment and Sustainable Development, which is responsible for the planning and management of **protected** areas.

At the provincial level, the management of both native and planted forests is governed by the Board of Forestry. Each province holds the domain of its natural resources and therefore is responsible for their administration, management and conservation.

With the constitutional reform of 1994, Argentina expedited the need to protect the environment. From the guidelines set out in Articles No. 41 and 43 of the Constitution, and through its ratification of international treaties on environmental protection, the country continues to pay a close attention on environmental issues.

The main national laws regulating various aspects related to forestry are:

1. Law No. 13,273 of Protection of Forests 1948, based on Decree Law 710/1995. This law declares of public interests in protection, regeneration, improvement and expansion of forests. It regulates the conservation of forests, prohibiting deforestation, un-rational use of forest products, and a provision to halt operations in natural forests without the consent of the competent forestry authority.
2. Law No. 24,857 of Fiscal Stability of Native Forests 1997. It covers implementation of forestry activities, restoration, management, protection, enrichment, sustainable management of native forests and the marketing of timber and non-timber products, and granting the following tax benefits for fiscal stability, limited to native forests:
 - A total tax burden existing at the time of submission of the feasibility study cannot be increased, or new taxes introduced, on the forestry operator. This protection covers both national, provincial and municipal levels.
 - Income tax is determined on a multi-year basis which ends with the production cycle of activity, thus avoiding the prescription of losses arising in early fiscal year.
3. Law No. 25,080 Investment in Forestry Act 1999, as extended and amended by Law No. 26,432/ 2008, seeks to increase the economic activity in the forest industrial sector. It creates a system of incentives for enterprises in the sector, projecting an economic activity that uses the available resources and integrates the benefits to the industry engaged in their processing.
 - This law supports the industrial processing of wood as one of the beneficiary activities, in form of a forestry enterprise, through integrated forest industry projects.
 - The main elements are: a) tax stability for 30 years; b) possibility of capitalizing the annual increase of plantation area without tax increase; c) exempt forestry companies from paying tax on assets or any other estate tax on forest inventories; d) optional system of accelerated depreciation

of capital investments in approved projects; e) anticipated return of the Value Added Tax (VAT) on purchases or imported goods and services for forestry investment projects.

- It grants non-refundable financial support (AENR) to small and medium enterprises: 80% of the cost of planting 300 hectares, 20% from 301-500 hectares of planting.
4. Law No. 26,737 Protection Act of National Domain is governing the ownership or possession of rural lands in 2011. The law regulates the ownership and possession of rural land to any destination, whether for use or agricultural, forestry, tourism or other uses, by foreign individuals and legal entities. It carries a limit of 15% of the territory sold to foreigners, and stipulates the provinces to report on the area of land owned by foreign individuals or legal entities.

This Law has frozen the acquisition and sales of land by foreign companies for example in Misiones province. Forest industries are actively campaigning to overhaul these restrictions. A status quo in the land market is not helpful for attracting foreign investors in planted forests, what has become a major political debate in the sector. AFOA has estimated that the growth of Argentina's forest resources would allow the expansion of industry by two modern pulp mills or similar large-scale ventures, for which foreign partners and capital would be needed. Currently, all major investment plans have been put on hold, as foreign financing is more affordable than Argentinean financing. Technology suppliers offer often project financing to Argentinean forest industries to facilitate machinery investments. But for large-scale greenfield investments international and national bank financing and guarantees are a must.

5.3 Wood Construction Promotion in Argentina

The main disadvantages of wood for construction in Argentina are perceived through some technical and cultural barriers:

1. Wooden constructions have a durability of 30/35 years while brick and concrete last for 80/100 years; (this is, however, a lot less than an average international life-cycle for wooden houses);
2. Built wooden houses are not keeping their value as brick and concrete (this is related to the above metrics which may be improved);
3. Due to cultural factors wooden houses are considered lower quality than traditional brick and concrete (this has a strong cultural bearing in the perception of healthy and safe living environments).

(Source: Forest Production Magazine No. 14 October 2015. Ministry of Agriculture, Livestock and Fisheries)

In face of these challenges, the Argentina Chamber of Wood (CADAMDA) promotes and leads together with major companies, a comprehensive and massive action in order to generate a culture change in the way of traditional construction. It has launched a slogan "Sustainable construction, wood is the solution". CADAMDA has created a website www.maderayconstruccion.com.ar to inform the public on matters related to the environmental, social and economic benefits, and to the functional advantages of using wood in construction. The short assembly and construction finishing offer a key positive argument in favor of wood. Time from the delivery of pre-fabricated house to assembly on an approved housing plot can be shortened to just 1-2 weeks, and total span from house purchase to moving in is rarely more than five months.

In order to capitalize from the good examples, and reverse negative perceptions, the implementation of PROCREAR is being stimulated through a wide effort in awareness-raising, dissemination, and education and training activities.

5.4 Building Regulations Development

Wood construction has been promoted in Argentina since the 1990s, but the work has lacked the rigor and effectiveness that is common to nations with a well-established wood housing industry. Argentina has traditionally looked upon North America for models in developing building regulations and pilot housing designs on wood. Pilot houses have been built in traditional wood-frame system with the help of e.g. the Construction Institute EMOICQ of Quebec.

The Instituto Nacional de Tecnología Industrial (INTI) and Centro de Investigación de los Reglamentos Nacionales de Seguridad para las Obras Civiles (CIRSOC) developed the national rules for calculating wood construction called **CIRSOC 601: Argentine Regulation on Wooden Structures**. It contains general provisions and technical (physical and mathematical) requirements for the design and construction of wooden structures in buildings. It is much indebted to the American Wood Council and the American Forest and Paper Association for a basis for the development of this regulation. Especially relevant was the National Design Specification (NDS) for Wood Construction (2005). Technical assistance was also received from GEMA - Grupo de Estudio de Maderas - of the Universidad Tecnológica Nacional of Uruguay (UTN).

5.5 IRAM - Argentine Normalization and Certification Institute

The Argentine Normalization and Certification Institute (Spanish: Instituto Argentino de Normalización y Certificación IRAM) is the national member body of the International Organization for Standardization (ISO). It is the main repository of building material standards and regulations for structural use. IRAM covers wood, steel and other building materials.

IRAM has the following key standards that have a high relevance to the renewal and design of new standards and regulations affecting wood in construction:

1. IRAM 9513 (2007) **Round poles and cross-arms eucalyptus**, preserved, for overhead power lines and telecommunications systems. Requirements.
2. IRAM 9664 (2013) **Structural timber**. Determination of the characteristic values of the mechanical properties and density.
3. IRAM 9670 (2002) **Structural timber**. Classification and requirements of resistance for pine sawnwood (*P. elliotii* and *P. taeda*) of northeastern Argentina by visual assessment.
4. IRAM 9663 (2013) **Wooden structures**. Sawn timber and glued laminated timber for structural use. Determination of some physical and mechanical properties.
5. IRAM 9660-1 (2015) **Structural glulam**. Part 1: Classes strength and manufacturing requirements and control. IRAM 9660-2 (2015) structural glulam. Part 2: Test methods.
6. IRAM 9662-1 (2015) **Glulam structural**. visual classification of resistance tables. Part 1: Tables Parana pine (*Araucaria angustifolia*).
7. IRAM 9662-2 (2015) **Glulam structural**. visual classification of resistance tables. Part 2: Tables grandis (*Eucalyptus grandis*).
8. IRAM 9662-3 (2015) **Glulam structural**. visual classification of resistance tables. Part 3: Tables ellioti taeda pine (*Pinus taeda* and *elliotii*).
9. IRAM 9662-4 (2015) **Glulam structural**. visual classification of resistance tables. Part 4: Tables poplar (*Populus deltoides* 'Australian 129/60' and 'Stoneville 67').

5.6 Pilot Construction Projects

Some high-profile examples of the new wood architecture, technical regulations applied in innovative design, and also skills to assemble the structures are visible in different parts of the country. One example is PINDO SA, based industry Misiones, which was responsible for providing the construction of wall-lining material for

the *Kirchner Cultural Center* (Figure 5). Timber is from the company's planted forests of *Araucaria angustifolia* (Parana Pine), which is rarely allowed to woodworking. Boards are finger-jointed in unit measures 1 x 5 inches into lengths up to 9 meters.

INTA had already in 2007 collaborated with the Institute of Construction of Quebec (EMOICQ) on designing and building pilot houses of eucalyptus (Figure 6). EMOICQ trained INTA and contractors on the platform and network system, demonstrating the many virtues of the system, in terms of speed, level of ease, simplicity of engineering works, etc.

6 RECOMMENDATIONS FOR FURTHER WORK

This report is the result of a short pilot study. On its basis, there is an interesting prospect to continue the work with a more detailed study pertaining to:

1. The current experience of the PROCREAR Programme's impact and effectiveness to promote and enable wood construction;
2. Collecting more detailed construction data by province and reveal wood construction numbers (this data is still largely unavailable in Argentina);
3. Assessing the adequacy of other supporting policy and economic instruments applied in stimulating wood construction;
4. Reviewing the normative measures, technical standards and regulations that may still pose hidden obstacles;
5. Assessing the architectural and perceptual challenges, and influencing the public opinion for a renaissance in wood construction;
6. Suggesting ways to monitor and report socio-economic and climate change benefits of wood value chains in the building and construction sector in Argentina;
7. Comparing the Argentine measures with similar approaches in other case study countries (e.g. Sweden, Japan), and propose evidence-based best practices.

Proposed Study Details:

1. Method: a combined desk research and interviews through an e-mail questionnaire;
2. Selection of about ten important construction areas (inc. BA, Misiones, Corrientes, etc.) and corresponding organizations for
3. Facilitating agencies: AFOA, INTI and INTA (National Institute of Agricultural Technology)
4. Assignment length: 6 weeks for International Consultant; with a possibility for one mission to Argentina for max. 10 days (see Annex 1 for knowledgeable experts)
5. Reporting: a workplan (1 week); draft report (4 weeks); final report 6 weeks;
6. Final report to contain a Word document (max. 40 pages) and a Powerpoint presentation (15 slides)

Figure 5. Flagship of modern wood construction in Argentina: The Kirchner Cultural Center

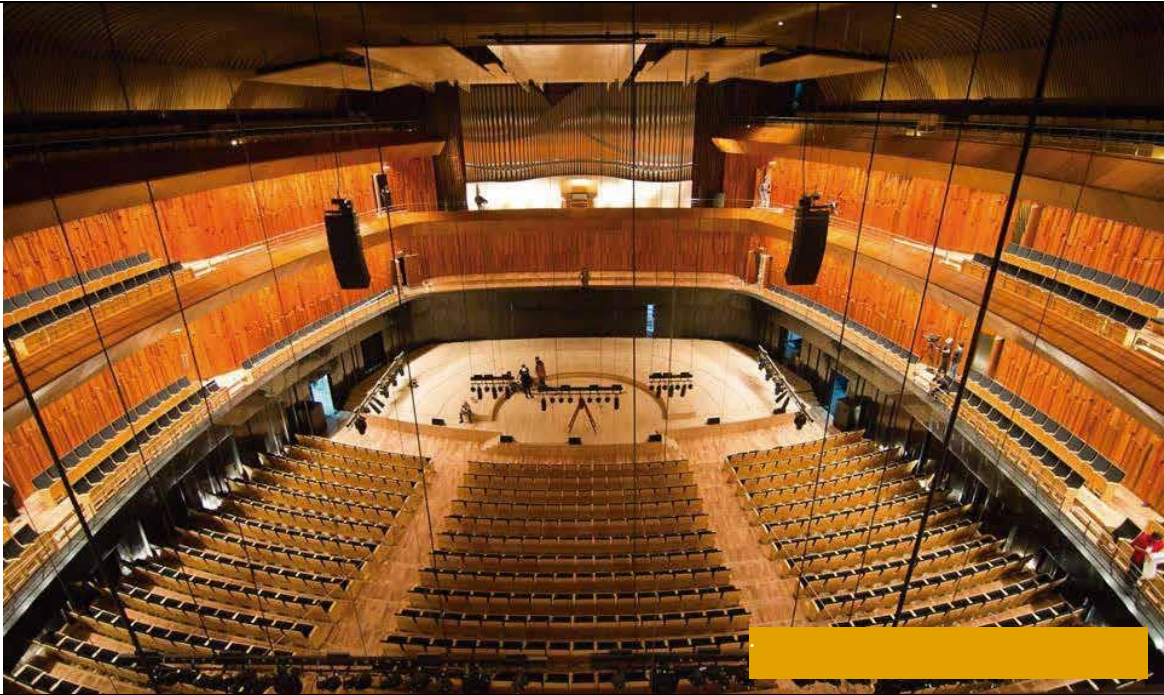


Figure 6. Canadian wood frame eucalyptus pilot house in Concordia



Annex 1. Key persons to contact for further study

National Government:

Sub-secretariat of Housing: Mr. Pablo Guiraldes

Sub-secretariat of Forest and Industry Development: Ms. Marta Stolkiner and Ms. Alicia Martin

In private sector the active experts include:

Misiones:

Mr. Pedro Lopez Vinader – President of APICOFOM, Cámara de la madera de Misiones y constructor de casas de madera

Mr. Cristian Gruber – President of AMAYADAP, (Second) Cámara de la madera de Misiones y constructor de casas de madera

Corrientes:

Mr. Francisco Torres Cayma, Director of APEFIC

Mr. Marcelo Torrisi: Director at Tapebicuá company

Entre Rios:

Mr. Martin Sanchez Acosta, INTA

Enterprise Abuelo Sixto: Construction company on wood (Concordia, Entre Rios at work with the first 250 wooden house village

Buenos Aires:

Mr. Osvaldo Vassallo: President of CADAMDA

Mr. Isaac Kybyz: company Maderera Llavallol on prefab house manufacturing <http://maderayconstruccion.com.ar/>

Mr. Jorge Barroso - Architect, Professor and a leading house construction professional

Mr. Gonzalo Campo - INTI Madera y Muebles. Architect dedicated to wood construction at Instituto de Tecnología de la Madera.