

70 YEARS OF SCIENTIFIC RESEARCH IN THE FIELD OF FORESTRY AND WOOD - WORKING INDUSTRY

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ABSTRACT

Starting from the premise, to beautiful presented by the first manager of Institute for Research and Forest Experimentation, the illustrious men of science Marin Dracea, in the first issue of IRFE Annals entitled "The settlement of solid ground of our forest economy and rational soloing of forestry problems, cannot be achieved without effort and sustained by own researches which should take into account the specific of our country, both regarding the conditions within develops the forest economy and the it's targets, at the same time with the establishment of the Institute in the year 1933, was organized a laboratory for logging (forest exploitation), wood technology and industrialization.

The restricted staff of the laboratory composed by two forest engineers, fresh graduated and a chemist, begun the work with great enthusiasm, organized and equipment in the first stage a laboratory for wood technology aimed specially for wood study as raw and work material for industry and constructions.

The present results of the scientific research in the field are constituted by the contributions of many researchers and designers generations. Despite that a presentation of the activity developed in '70, isn't only difficult but also hard to be emotionally controlled, the authors try to remember names, facts and works that were references points in the establishment of forest sustainable management system and which determinate the modern configuration of the wood-working industry in Romania.

Keywords: research, development, sound use of wood.

The forestry research in our country is as old as the Forestry Body establishment. The development of this sector evolved but, for a long time - more than a half of century, the Romanian foresters focused on the necessity of development of own researchers, presented in supporting this proposal, preoccupations and results of the

impressive researchers from other countries.

An important role in the transformation of forestry act into an act with national specific had the Society "Forestry Progress" and Forest Review -so much suggestive secondary- underwrite "Property of the Society "Forestry Progress").

In a synthesis regarding "The forestry year 1929", Mr. Marin Dracea and Mr. Vintila Stinghe declared "The Forest Review aims systematically to extend it's activity on s much as possible various fields connected t o forestry on the one hand, and on the other hand to provoke a profound study of the specialty matters".

At the same time the founding in the year 1930 of the Autonomous House of State Property Forests - CAPS, with a activity program which included also the wood-working industry development, it has been indispensable to find a solving scientific modality of the forestry economy problems or of those concerning to the development and reasonably utilization of forest products. On January 1933, was founded "The Agency of Study and Forest Research", managed by CAPS, that in May the some year became "The Institute of Research and Forestry Experimentation".

In this way, "it has accorded the adequate importance to the Institute and works which constitute its activity objects, as well as further the development possibility in a adequate form of needs and possibilities will occur"(Report of Agriculture and Domains Minister, dr. Voicu Nitescu - registered under number 106597 from the 16th May 1933).

The Romanian forest research had the great opportunity that at it's beginning, to be organized and lead by special personalities, practicing and also science peoples and university members at the same time, which used all the possibilities for scientific development and especially for implementation those results in the economical activity.

The first manager of ICEF, the illustrious science men, prof. Marin Dracea, presented once again the ideal of Romanian researches in Forward from vol. I of ICEF annals, issued in the year 1934 "The settlement on solid ground of our forestry economy and the reasonable solving of forestry problems, cannot be achieved without strength and unceased own researches which take into account the specific of our country both regarding the conditions within develops the forestry economy and it's targets".

In this sense, acted from the very beginning the two researches from the "Laboratory: Forest Exploitation - Technology and wood - working" graduated even in the year of Institute, Technical High School - Bucharest - Forest Department - settlement, the engineers Nicolae Ghelmeziu and Eugen Vintila, developing, especially research acti-vities in the field of physical - mechanical and technological characteristics knowledge, of the main domestic wood species, but also researches regarding the drying, steaming and wood preservation .

The retrospective analysis from the years '60-70, focused on the small number of researchers in this field and the insufficient labs at the Institute founding, that doesn't equipment allowed to carry out profound studies based on a coherent action plan.

Studying the respective period documents, especially the specialty publications, they did arrived to another conclusion.

The period 1934-1947, constituted the base of researches and development. The problems of forests production - we refer only to logging and industrial wood processing - were in the central point of the whole Institute, not only of the above-mentioned laboratory.

Recognized researchers supported the tenacity and involving of the two young researchers: prof.dr. D.A. Sburlan - The Chief of Forest Engineers Office, mechanical installations and techniques for transport and industrialization; dr.eng. V. Sabau - from the Department Rationale Administration, economy, work organizing, and also by perfect experienced practices as dr. I. Pavelescu, who was for many years the Chief of the Experimental Forest Range "Carol I" from Mihaesti Muscel.

It has exited at the same time a wish to make known the researches results through all means (by all ways). We cannot present detailed the orientation and the results of researches.

Table 1,2 - Situation of forest products export of Europe and Romania in the years 1934-1937*)

Assortment	Europe				Romania			
	1937	1936	1935	1934	1937	1936	1935	1934
	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³
Fire wood	567.863	410.122	740.163	1.003.286	252.233	201.293	191.658	210.675
Saw logs	3.012.668	3.039.529	3.294.844	3.205.609	60.380	77.433	75.411	31.072
Pit props	5.368.906	4.239.389	4.228.798	4.156.466	42.808	21.318		
Pulp wood	5.816.215	5.975.328	6.601.337	7.377.246	25.858	35.000		
Poles	535.651	680.252	956.364	907.178	-	-		
Railroad sleepers	909.774	663.341	644.272	673.242	35.156	42.368	4.106	
Hewn timber	810.229	628.377	613.305	721.117	164.462	143.893		
Hoops	61.897	78.769	67.296	63.880	5.645	5.086	3.769	7.739
Sawn timber	18.837.076	18.257.554	18.376.464	19.651.960	1.369.549	1.347.103		
Planed boards	1.101.171	1.310.583	1.141.186	1.206.567	-	-	1.351.600	1.370.805
Box boards	991.192	770.231	691.526	579.483	58.978	18.104		
TOTAL	38.012.637	36.057.475	37.355.555	39.546.034	2.005.069	1.891.600	1.626.544	1.620.291
%export 1934=100					124	116	100	100

*) International wood market in 1937, ing. Grigore Vasilescu, Forest Review nr. 2 / 1938

But, we can affirm that the principal preoccupation was to better reevaluate the Romanian wood. Self - evident of these years the wood - working processing, meant, is the situation of forest products export of Europe and Romania in the years 1934-1937.

It can be settled that while the European export of wood in the year 1937 is by 96 % in comparison with 1934, Romania exported 124 % in comparison with the same year.

“On the eve of war, from round 4 million m³ harvested resinous logs, was exported 1.1 million m³ sawn timber, and from almost 10 million m³ deciduous logs, were exported no more than 120000 m³ sawn timber. The beech was few harvested, the areas of this species needed investment in transport means. It was converted, at the place in manual hewn rail rod sleepers and fire wood” (Eng. N. St. Dumitrescu “40 years research and 25 years forestry development in Romania”, Review The Wood-working

industry, nr. 9/1937).

This situation induced Mr. Dr.eng. N. Ghelmeziu, to write in the paper "For clarifying some matters from wood technology field" in the Forest Review nr. 4/1940 "That in our country, the progress registered in the wood acknowledge is few known . There absolutely necessary an action to spread these acknowledges, a movement in the favour of so much as extended wood improvement. For these success, we think it needs that them to be redoubled by an as much as exact acknowledge of the Romanian wood".

In this reason, of Romanian wood acknowledge, a national industry of premise creation acted in the first years existence of ICEF. We take the liberty to let again in the actual specialist attention some issues we have selected from the volume "The publications of the Institute for Forest Researches of Romania 1934-1947, as well from the collection Forest Review", from the same period, and we mention once again the utilization of all existent means in that period in order that the researches results reach as quick as possible the persons interested in their application or to render sensitive the authorities in the forestry politics elaboration. We quote:

From: Series I - The Annals of the Institute for Researches and Forestry Experimentation

Mr. Eugen Vintila: Researches regarding the relative moisture content of wood when used in current application - vol. VIII; Researches on oak green wood - vol. IX1; Researches on density, shrinkage and water content of beech wood - vol. XI.

Mr. Nicolae Ghelmeziu: The influence of humidity on mechanical work and rupture strength through dynamic bending of spruce wood - vol. XI.

From: Series II - Handbooks, reports, communication and laws:

Mr. Vasile Sabau: Fundamental elements of Romanian forest economy and its importance for international wood trade (The aware Stefan Demetrescu Vergu of Romanian Academy in 1935).

Mr. Ion Pavelescu: The problem of rough deciduous wood grading: Iuliu Moldovan and Mihaestii. Contribution to forest experimentation history in Romania.

Mr. D. A Sburlan: Contributions to inaccessible forest study in Romania.

Mr. D.A. Sburlan and N. Ghelmeziu: The mechanical wood industry.

From: Seria III - The popularisation library:

Mr. D.A. Sburlan: Practice acknowledges about sawn timber industry and trade.

Mr. E. Vintila: Practical considerations on drying and wood preservation.

Mr. N. Ghelmeziu: Special utilization of wood.

As far back as in the very beginning it's existence, the **Institute for Forest Research**, promoted the collaboration with International Associations. As consequence of participation to the work of Wood testing Commission within the International Association of the Institutes for Forest Research, were promoted researches in the field of plywood (the strength of gluing at plywood; issue put into discussion for the first time at the work se-ssion in London, 1939). In the same time was intended the participation as member in the professional, specialty associations from our country. Example: from the settlement, in the year 1949, ICEF was member of Romanian Group for mate-
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rials testing within the Romanian Association of bridges, Frameworks and Materials Testing.

The last years of this first stage in the life of Romanian forest research, were marked by tragic events: the war, the drought, social and political changes which begun to be left. The valuable specialist were removed with brutality from the scientific activity, but it can't ignore the reality of institute realizations, and the necessary of it's presence in the general activity of forest economy - the Law nr. 173 published on the 5th June 1947 in the Official Gazette nr. 125 for institute's reorganization which become the Romanian Institute for Forest researches, kept, as a whole, the same structure of the institute. In this organization structure, the Institute worked only until the year 1951, when was divided in ICES - The Institute for Forest Researches and ICEIL - The Institute for Wood Industrialization Research, and in the period between 1951-1959 followed manifold reorganizations, divisions and regroupings (in the year 1959 existed three institutes for researches and two institutes for study and developments (design)), so that in the year 1960, the forest research, as it's whole, to be rejoined within the Institute for Forest Research - INCEF, similar the investments development (design) finding again within the Institute for Forest Study and Design - ISPF.

An important moment for forest sector development marks the year 1959, through the grounding of the Institute for Forest Design. We quote several objectives found again in the design activity from it's very beginning, objectives presented by eng. I. Lungu in the paper "The Institute for Forest Design. Scope, organization and functioning" published in the Forest Review and the Wood Industry Review, nr. 4 from 1950:

"The preliminary operations still undeveloped for difficult accessible primly forests because of lack of the investment means; regrouping of existent industry and transport means related to forest areas or group of forests that (which) constitute the great natural forest units; the matching of these installations capacities with the natural possibility of forests; the adapting of saw mills also for rational (reasonable) beech logs; conversion of beech logs; the increase of beech wood quantity that is industrialized ; the development of improved processed wood products industry (veneers, plywood, blackboards); the development of the industrial sector of finished wooden products and the change of it's actual character that is more handicraft in an industrial one, the development of new industries for improved half - products as are: fibre - and chipboards; the rationalization of technological processes in the existent factories (mills). The mechanization in as much as possible high degree of the works; the mechanization of skidding works till the transport means and installations with high capacity, the mechanization of forest transport with specific means, the increase of forest efficiency through forest roads construction which allows the cultural operations and forest products harvesting before stands reach the exploitability age."

It can be said that these objectives completed and changed depending of that stage, were the basis of research and design activities, the collaboration between these two activities finding the optional solution starting with the year 1970 through the establishment by merging, of the Institute for of Research and Design for Wood - working Industry - ICPIL, which, beginning with the year 1992 become the National Institute of

Wood - INL Bucharest.

It is difficult, now, to present the huge volume of work developed along tens years of research and design in forest exploitation and wood - working industry. Is almost inhuman that from the work of thousands peoples bend over the microscope or drawing board, to distinguish only some achievement or personalities. We propose to do not such a injustice. We can, but, appreciate, without committing an injustice, that the modernizing of all work processes in the forest exploitations and in the wood - working industry, that are marked significantly also by the results of these activities. We consider, that the main contributions of research and design in this field can be synthesised (by following):

- the wood study from the point of view of it's natural durability, competitiveness with improving (melioration) and preservation treatments and also of the newest processing and finishing technologies of the products. In present, the data bank of National Institute of Wood provides information's about 250 domestic species and tropical ones, many from the determined data for indigene species constituting Romanian contributions to the international effort for wood knowledge development;

- the identification of biologic injurious to wood, the knowledge of biodegradation processes and also the setting of preventive preservatives and increasing the wood and wood - based products life. The products achieved by researches, are original and were recognized as such by patents, and preponderant in the last period, constitute the result of the collaboration with international (world - wide) (e.g. Company Bayer - the products ROMBAI);

- the conceiving and achievement of installations for logging, primary processing and wood transport, assuring in this way the implementation of some sustainable technologies, with a high degree of mechanization of works;

- the equipment in the forests with transport installations, the design of over 40000 km of forest roads;

- the design of over 400 mills (factories) for wood - working in our country and 30 factories or industrial complexes abroad, in the frame of direct contracts or intermediate by international organisms;

- the settlement of production technologies of chip-and fibreboards, using in the first row the beech wood which is the predominant species in the Romanian forests;

- the research and design of new finished wood - based products, with functional and efficiency characteristics steady improved, on which bases the industrial production assured, in great measure, the new products stack.

It is obvious that research - design activity supported the investment efforts leading to the production structure change in the branch. The export of the main wood - based products in the period 1960-1989 (see Table 3) shows these changes and is in all impressive in comparison with export situation at the beginning of research activity in our country, as it was presented in the Table 2.

The principles that were at the base of the industrialization, the concept of production diversification, of wood conversion in to high processed products, are valid still today. After breakneck decrease of industrial production at the beginning of transition

Table 3 - The export of main wood-based products in the period 1960-1989, in Romania*)

Specification	M.U.	1960	1970	1980	1989	
Pulp wood and boards	1000 m ³	354,8	667,7	164,4	-	
Resinous sawn timber	1000 m ³	867,8	1273,9	571,6	586,0	
Deciduous sawn timber	1000 m ³	344,5	642,9	312,2	224,4	
Plywood	1000 m ³	23,5	102,8	127,2	72,5	
Veneer	1000 m ²	3311,5	7594,2	4392,0	2994,0	
Chip boards	1000 m ²	321,7	2712,9	13536,9	7221,0	
Fiber board	1000 m ²	-	11683,0	19859,0	22719,1	
Furniture	{ -million hard currency lei -million lei	61,9	465,8	1827,9	8077,7	
Paper		1000 tons	8,4	103,8	163,4	110,1

*) Statistical yearbook of Romania, 1990.

period, the years 1990 - 1993, actually the situation in this branch (sector) in much better. We consider as significant, several data registered at the end of the first half-year 2003 or foreseen for the whole year:

The wood - working industry known (registered) in the period I.I.-30.VI.2003, an increase by 17,8 % in comparison with the same period of the previous year. The putting into operation of some important production capacities in the previous (anterior) years changed the structure of the wood and wood-based products production and trade, evidencing it the reduction (decrease) of rough wood (logs) exports (the levels of the year 2000 represent for this products, peaks difficult to reach, despite that, starting from the year 2002, there are no more restrictions for export), as well as the Romania's assertion on the international market with high processed products and wood secondary products;

In the wood - working industry as a whole, it keeps the high share of furniture industry (45,5 % from the total production in the first six month of the year 2003), the trends following to ensure an increase of this production up to 50 %. In the first half-year 2003, from total exports of wood and wood-based products, the furniture export in amount of 348.3 million EURO, in increasing trend by 5.3. % in comparison with the same period of previous year (2002), represented 44.8 % and it's foreseen the maintaining of this share also at the end of the year 2003;

The investments done in the last years, leded to a significant increase of chipboard production, 370000 m³ in 2003 in comparison with 145000 m³ in 2002, as well as of the export availabilities 200000 m³ in 2003 in comparison with 59 000 m³ in 2000 (by 3.4 times).

The production of fibreboard, without changes in production capacity, indicates a slight decrease caused by the general revision of the plant MDF-Sebes Frati. It is foreseen a production of 299000 m³ fibreboard in 2003, of which MDF (a new product of Romanian industry realized in the plant MDF - Sebes Frati), reaches 270000 m³. The MDF export will represent 85-87 % from the production.

Turning back to the period until 1990, the negative influences due to politic interference in the scientific activity, were many times diminished by the tenacity with that the researches and designers acted to keep the contacts with scientific international society, in order to involve in their activities, to match the programs, results publishing under diverse forms: articles in specialty reviews, synthesis, "Studies and researches", informative Reports, catalogues for new products presentation. In this period issued the specialty hand books for all the activity fields of forest sector, some of them constituting results of the collaboration between the experts in research and university education. The reviews "Wood - working industry", "The Furniture", "Forest Review", provided in great part with documentary articles presenting the issues and scientific results of the very moment, constituted the base of a steady exchange of information's with world-wide speciality publications (reviews). At the beginning of '90, this exchange embraced a number of 63 titles. The international recognition of Romanian research and design enables the organization by the EEC - Timber Committee in the year 1976, in Romania, of the symposium entitled "The extension of wood waste utilization" and the active participation at the activities of FAO - UNECTE workshops, as are The Commission of Poplar "The Commission for Wood Preservation and Improvement".

Despite we assumed to give not examples, it's necessary to emphasizes the special activity and of long duration developed by the eng. N.St. Dumitrescu within the EEC, where he was deputy chairman of Timber Committee in the years 1965-1970, Chairman in the years 1971 - 1973, as well as at United nations Organization for Food and Agriculture - FAO, as Director of Documentation Division and Library in the period between 1973 - 1978.

The great savant Nicolae Iorga, said, referring to the scientific activity: "In the science, the very first discovery begins a long way of efforts that ends together with the life".

The year 1990, meant a new beginning for the whole Romania. The research, design, liberated from many of the past constraints, had to face some new challenges. The raw materials products, machinery, installations imports liberalization, the privatisation removed for a while the production companies from the Romanian solutions. The Institute settled the priorities depending on the new requirements, the conditions imposed by the economy alignment to European Regulations. These changes leded also to the employee number and structure change. Actually, the Institute has 271 employees of which personnel of high education graduated for R & D - 123, from which 48 % being certified (attested) personnel who owns the technical, material, scientific and human resources base with can approach R & D themes from the industrial exploitation and wood - working sub sectors, including the furniture production. The 8 laboratories for testing are certified by RENAR, the product testing is carried out in accordance with international standards. The total adopted standard are 239 of which 78 SR ISO and 161 SR EN. For the control of free formaldehyde emission and content in the wood based products, INL is the representing the Institute OTTO GRAF FMFA - Stuttgart Germany.

The R & D activity developed in these years, was priority directed to the increase of

scientific and technological competitiveness and meeting progress requirements of the progress requirements of the national economy, through achievement of some objectives included in the National Program for Scientific research Technological Development and ORIZONT 2000 and the participation at the realization of programs included in the National Plan for R & D and Innovation.

In the frame of Programs RELANSIN, CALIST, INFRAS, MENER, AMTRANS, MATNANTECH, CORINT and EUREKA, were carried out researches included in 20 projects, from which, in 2003, being in development 14 projects. The approached thematic contributes to the infrastructure development of the quality through implementation of quality management systems and the certification of test laboratories (it mentions in this field the collaborations in the frame of the Program ROM UNDP, applying of a ERP software in the furniture factories, the increase of economical competitiveness, the stimulation of quick implementation of the inventions in economy, modern and specific technologies for the development of new products and services, the substantiation and support of sustainable management politics and strategies of the field. The integration of Romanian scientific and technological activity within the European Community, constituted the object of the participation at the programs TEMPUS, EUREKA, CEE-NNE 5. The National Institute of Wood has two delegates in the Management Committee of COST E Program: Forests and Forestry Products and participates at 14 themes from it's activity field. It is member of the Timber Committee within the EC for Europe, in Geneva, national correspondent for wood market and has delegates in three teams of specialists, organized by the Timber Committee in the collaboration with the corresponding organism FAO - European Commission of Forest.

In this period were developed specific activities to partnership structure, for example, the "multiclient" research specific to SME's working in the field of logging and processing of wood, studies, estimates, marketing, technical documentation for investments necessary to, restructuring, developments, modernization of factories and forest roads. The technical assistance and survey are carried out in diverse modalities, and constitute the main transfer mean in the industry of the R & D activities results. The enterprises are supported by improvement actions of own performances through marketing, technological and feasibility studies, optimisation studies of production processes, recommendations for products improvement.

We are not totally satisfied of our relationships with the industrial partners; we have reduced possibilities for renewing and modernization of R & D material base. The most disappointing for us is the lack of interest showed by young people for this activity, but we can that understand when we think at the low possibilities for its recompense. We don't want to come with our proposals for understanding and monitoring of R & D activities. We overtake the conclusions of the Academician Prof. Gr. Eliescu, drawn in the article "The forest research in its connections with the forest practice", published in the Forest Review, Nr. 4-6, 1945:

"1. The forest research is an activity by which: it provided informative know ledges in the field of actual sciences any times the practice requires: it brings somebody to know ledge new truths from phenomena world or forest technical;

2. The research should have a well-established program, on long term, in the field of problems (issues) indicated, preferably, by practices, problems that can provide steady preoccupation and work to researches;

3. Grould have, beyond question, the necessary endowment (in cash, in kind, in personnel), in order to develop and follow the researches that built the work program”.

These above mentioned are amazing valid also today. In the moment they will be understood, our activity, of all of us, will be better. We are full of convictions that forest researches will be connected and will follow the forest along its entire life. We will conclude with a recommendation:

“Keep walking, at the end of your life you will find surely another walker who will keep walking further”. Nicolae Iorga - Meditations.

REFERENCES

Collection of:

REVIEWS: “FOREST REVIEW”, “WOOD WORKING INDUSTRY”, “THE FURNITURE”;

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