

# RESEARCH PILLAR OF TRINOMIAL TOWER – CATALYST OF SUSTAINABLE DEVELOPMENT

Ivan CISMARU<sup>1</sup>

Luminița-Maria BRENCI<sup>2</sup>

**Abstract:** *This paper aims to present the role and importance of research in the functional structure of the trinomial tower of development, the role of research in supporting and accelerating the development of human society in the areas of nations and world areas.*

*The functional interdependence of the structural elements of the trinomial tower requires ensuring the initiation of short-term and long term actions of interactions based mainly on the level of knowledge, endowment with investigation equipment, actual and future demands of the society and economy, the forecasted development of human needs and society perspective, the level of application and integration of knowledge development results, social interests in supporting and directing the development of knowledge, etc. The structure of research pillar and the way of interaction within the system plays an important role in boosting all actions and activities aimed at supporting the development.*

*Adding the concession concept into the tower trinomial system will enhance the dynamic of development and will provide certainty in finding suitable applications required for development.*

**Keywords:** trinomial element, trinomial tower, research, concessionaire.

**JEL Classification:** M<sub>0</sub>, D<sub>83</sub>, Q<sub>56</sub>

## ***1. Introduction***

It has been shown (Brooking 1998), that the human society development was achieved by persons who have creative and innovative

---

<sup>1</sup> Prof., Eng., Ph.D.: Faculty of Wood Engineering, Transilvania University, Braşov, Romania, member of the Academy of Romanian Scientists, e-mail: icismaru@unitbv.ro.

<sup>2</sup> Assoc.Prof., Eng., Ph.D.: Faculty of Wood Engineering, Transilvania University, Braşov, Romania, e-mail: brenlu@unitbv.ro.

ideas, which applied to economy and/or to society, led to substantial changes in knowledge, production of goods, social organization, in one word led to changing living standards of the people.

Depending on the social importance of these innovative ideas, their application to zonal, national or global level was achieved, while some of them becoming "universal laws of development".

Innovative ideas (Pisoschi 2005) were generally completed by careful study conducted by people on nature and natural phenomena. They were shaped and refined through the great ability of people to abstract, compare and synthesize information and by imagining various solutions (Ardelean et al. 2006) to various human needs or simply to imagine both problems and solutions.

These people endowed with a remarkable capacity of achieving neural connections and a power capable of continuous efforts, with a permanent restlessness to create new, to invent, to improve different products, sizes, equipment, technologies by applying new solutions, these ones constitute the "tops of innovative creation".

Permanent activities of "searching" solutions, of establishing new functional rules, of imagining and checking technical, social and economic rules, was finally defined by humanity as research activities.

Research is one of the most important elements of the trinomial of development, being in fact the "engine" and initiator of the development of the human society.

Generally, the human being is not satisfied with the results of the own actions, about how people lives, how the society is organized, how people work, how they relax etc. People would always look for a change in their live, in order to avoid monotony that creates unhappiness. Therefore, people are in a continuous search of the change of their life and existence. It is known that the problem of "degradation of human personality" appeared with mass production, when people were forced to work on production lines, performing the same operations, the same rhythmic movements etc., reaching serious illness, sometimes irreversible. Due to the fact that people do not like repetitiveness, they started to investigate what to do in order to get out of this state of "existential monotony." It can be said that, from this point of view, the most "happy" people are those who conduct research, because they are not subjected to repetitive actions, investigating increasingly deep until reaching the aim of their research work.

In order to carry out research, a person must have complex abilities and a high knowledge level for making simple connections on the studied topic. Because the storage capacities of information and the diversification of specializations is rather limited for a person, it can be said that conducting of extensive and valuable research means:

- use of information data bases from the personal computer or library, internet, regional or national libraries;
- use of specialists with skills in multidisciplinary fields of specialization necessary for a specific topic, forming "research teams" qualified for one or more disciplines.

It was found that the best results (Calvestand Martin 2001) of the research work were obtained when the two variants mentioned above were applied simultaneously, thereby achieving multidisciplinary research with the benefit of providing complex information from various fields of knowledge.

The multidisciplinary research conducted to spectacular results applicable on several fields, with complex effects and efficiency.

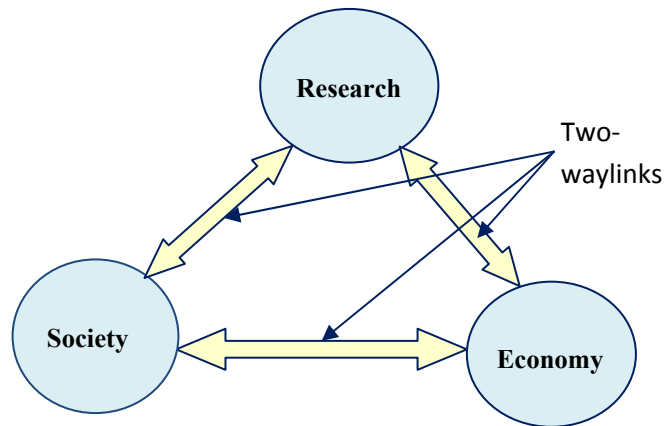
Basic research becomes the main element of the trinomial (Cismaru 2013) of development with hopes for the humankind. Research investigation has no limits of time and space.

## ***2. Trinomial of development and the role of research as structure element***

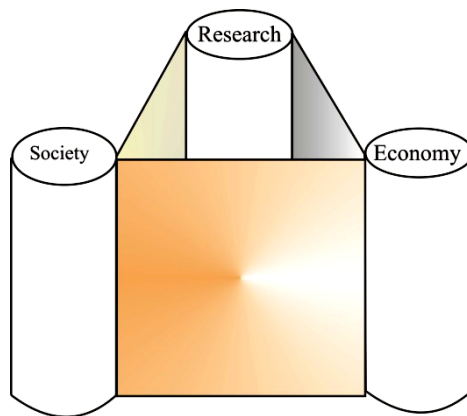
As previous mentioned (Brooking 1998), (Pisoschi 2005), (Ardelean et al. 2006) and (Calvest and Martin 2001), the trinomial of development (Fig.1a), refers to a certain field of activity and the trinomial tower of development refers to a specific activity at a national level (Fig. 1.b). In fact, the trinomial tower of development results by „overlapping” the trinomials of all activities specific to a country.

In the trinomial of development, functional and two-way links between the three elements can be achieved, namely:

- between economy and research, the following links are possible:
  - ✓ economy asks for results, ideas, solutions from research, aiming to an increase of productivity, to the ease of work, a better quality of the products, low pollution and low energy consumption etc. and offers funds for investigations (research) according to the requirements;



a.



b.

*Figure no. 1. Basic structures of development*

*a – trinomial of development; b – tower of trinomial of development*

- ✓ research offers to economy the results (in laboratory and industrial conditions) obtained by conducting investigations required by economy in its applications (processing, technology, organizing, specializing etc.) and needs short and long term financing for research and “ideas”, for equipment and

installation used in research, according to modern techniques of investigation and for required accuracy (Calvest and Martin 2001). In case of large companies, basic research is needed to achieve the goal of „solid demand” in case of economic changes;

- between society and research, the following links operate:
  - ✓ research needs specialists from the company to be trained in the education system, so that they form a dynamic and flexible structure, which takes into account both the demands of specialization of the economy and of the research. Research can also create its own systems to achieve specific specializations (with a small number of specialists). At the same time research needs funds for the development of basic research (from the national budget) or applied research (from institutions). These funds can be transferred by national laws through project-based competitions, or by institutional subcontracts;
  - ✓ research provides its results with regard to the institutional organization or reorganization at the governmental level (national, regional, local) to the company (or to the government institutions). These results should provide resolutions for the requests coming from the beneficiary side, by contracts between institutions, or by competition of projects organized at government or ministerial level, etc.
- between economy and society (Cismaru and Brenci 2014a) the following links are valid:
  - ✓ society demands from economy products and/ or services as good quality and price as in accordance with the new requirements and level of the human development and in accordance with the standard of living. The society offers to economy demands on goods and services for present and future and also specialists needed by economy in order to produce. It should be considered that the society provides services of maintaining the health and the working capacity of those who work in the economy, and also the possibility of training them. In some situations, the society (through government, ministries, state institutions) can offer financial support to economy when certain directions or fields require rapid development (Cismaru and Brenci 2014c);

- ✓ economy offers products and services complying with the requested quality and quantity to society and asks for specialized and able to work manpower.

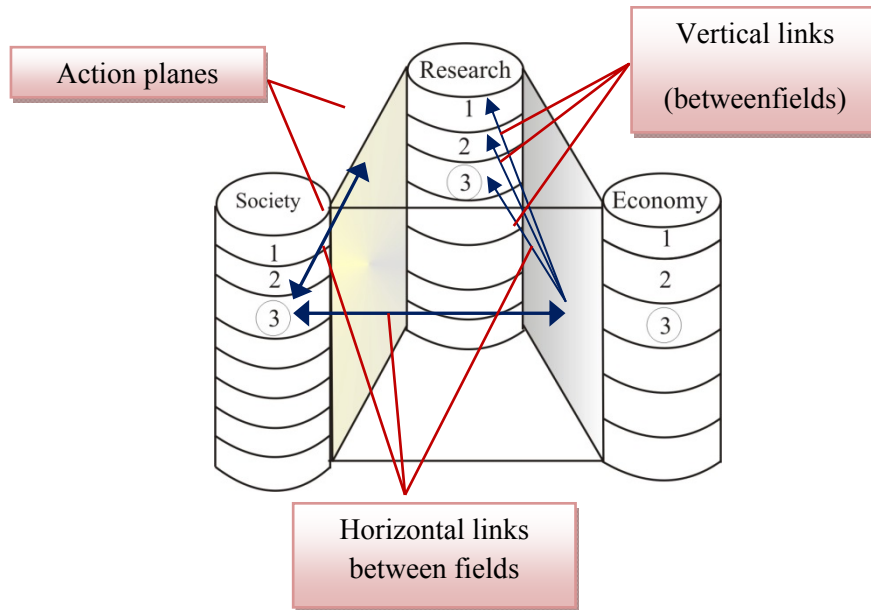


Figure no. 2. Structure and level of functional links in the trinomial tower of development

Of course, all functional relationships presented above may be performed at a given economic field in a trinomial of development. In case of trinomial tower, the functional relationships can be achieved both horizontally (in each trinomial specific to each economic field) and vertically (Fig. 2) when products from other economic fields are necessary in order to study a topic from another field.

For example, in the wood processing industry, namely in the furniture manufacturing field (as economic field) (Cismaru and Brenci 2014c) functional links with elements of research both in the wood processing field (Fig. 2) and in the chemistry field (for paints and varnishes), as well as in the plastics and metallurgy fields (for accessories) shall be implemented. At the same time, horizontal and vertical links are needed in order to ensure the specialists for woodworking, chemistry, economic, legal fields, etc. Finally,

we can say that the functional relationships in the trinomial tower of development work on certain "planes of activities".

### 3. Structure of the research element

Development of research activities, both as part of the trinomial and of the trinomial tower of development, is carried out in organized structures at different levels, as follows:

- at the level of the trinomial of development - in the areas of economic field, the research is carried out in specialized institutions (research institutes on specific fields). These institutes are delimited on the domain specific subdomains (eg. wood industry divided into the following subdomains:
  - tools, devices and checking devices;
  - technologies of thermal processing of wood;
  - machining technologies;
  - surface finishing technologies;
  - gluing and assembling technologies, etc.)

The domains and their subdomains (fig. 3) are organized at the institutional and regional level as single or distributed premises in the country.

In the trinomial tower of research (Fig. 4), at the national level, the horizontal structure is formed by specific economic domains and subdomains and vertical, by overlapping all distinct economic sectors, each one being associated with a specific trinomial of development.

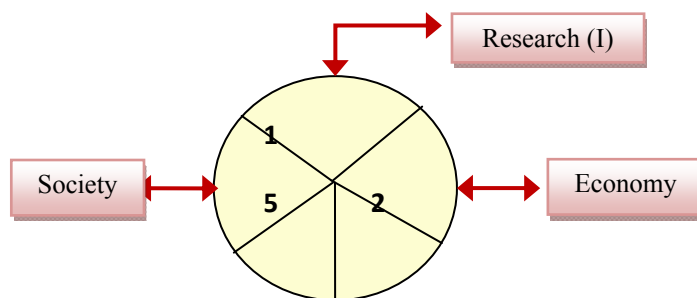


Figure no. 3. Structure of research in a domain  
(and subdomains) at the level of trinomial of development  
1, 2, 3, 4, 5 – subdomains of research in domain I

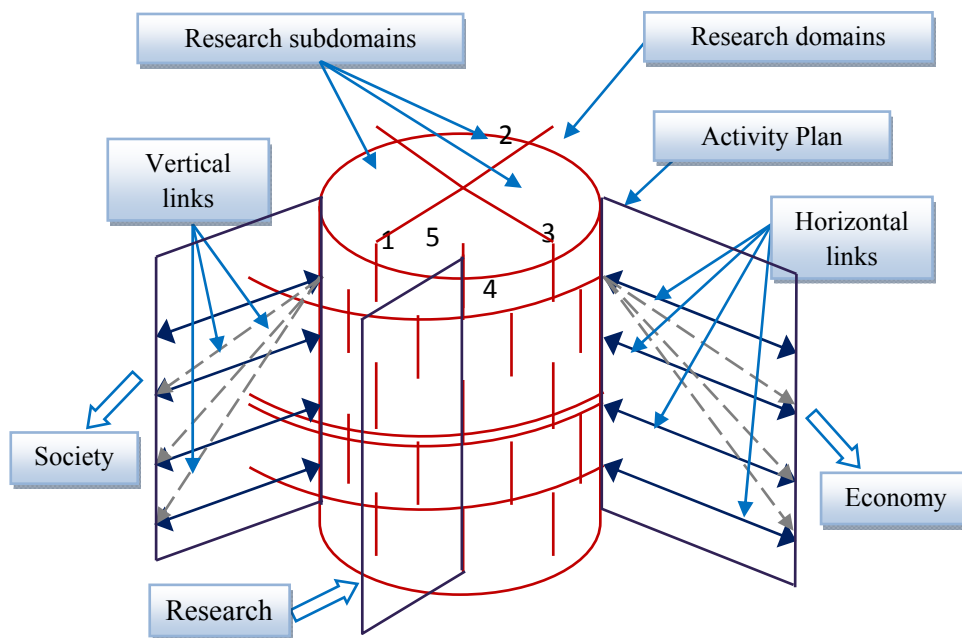


Figure no. 4. Structure of the trinomial tower of research and functional links between elements

In the trinomial tower (Cismaru and Brenci 2014 b), functional relations can be achieved both horizontally (with in specific trinomial of domain) and vertically (between different areas working together in order to obtain a product, service, activity).

Complexity of functional relationships at the level of trinomial tower (at national level) imposes structures to support trinomial tower of development. Thus, for the research tower, a “MINISTRY OF RESEARCH” is necessary as an independent structure, able to administrate:

- requests by economics to research;
- requests by society to research;
- requests by state and government institution to research;
- requests by foreign countries to research;
- elaboration of research national plans by compiling the research plans for each domain;
- establishing the strategy of basic research;
- offers of research results;



- strategy of organizing and directing the society at present and in the future;
- organizing of research projects competitions financed by government;
- setting on/setting off the research institutes;
- funds for the endowment of the institutions with research equipment, etc.

At the level of each country, the “MINISTRY OF RESEARCH” is the engine of society development by funding the research and the transfer of the research results into economy (products and services) and society, ensuring thus the basic principle of evolution, namely the increasing of the standard of living.

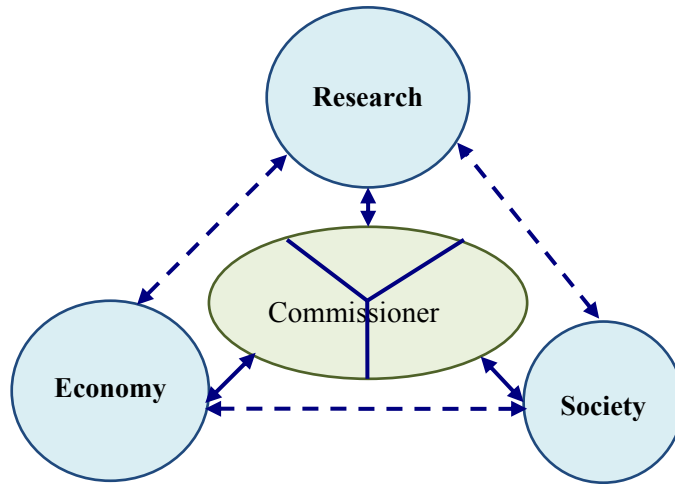
#### ***4. Commissioner structure and dynamic research***

As presented before (Cismaru and Brenci 2014b), (Cismaru and Brenci 2014c), simplifying the functional relationships in the frame of the trinomial and of the trinomial tower of development is possible by introducing an additional element, namely a commissioner (Fig. 5a) or a commissioner tower (Fig. 5b).

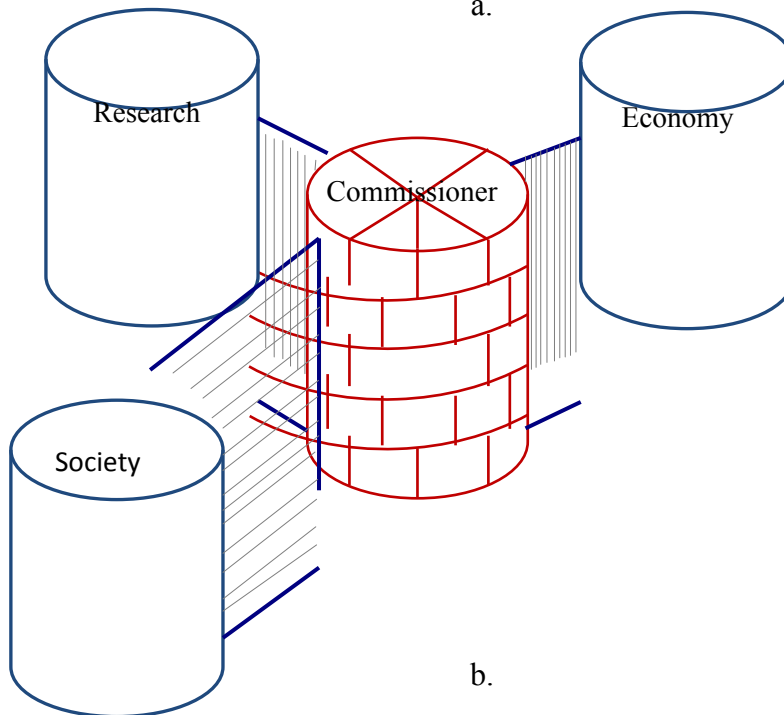
The commissioner element, as a part of the tower of development structure, is based on simplifying the relations between the basic elements of the trinomial, by empowering the commissioner systems for the supply-demand relationships. In this case, the commissioner can be designed as a data base in the economic sectors (in case of trinomial of development), or a national data base (in case of trinomial tower).

Through the work of the commissioners, the basic elements of trinomial (including research) are relieved by the activities of "mapping" the inquiries of the society market and of the economy on topics and research directions for which fast or long-term solutions are needed. In this case, the commissioner can be designed to form a database (inquiries and offers) for certain economic fields or as a national data bank in the structure of trinomial tower of development.

So, it can be said that functioning as a database (offers and inquiries) in a specific economic field, the commissioner can offer fast solutions for certain demands, thus simplifying the activity of searching for collaborators, the networking and solving the research problems.



a.



b.

Figure no. 5. Commissioner power in the trinomial system and in the case of trinomial tower of development  
 a – commissioner in the trinomial of development; b – commissioner in the trinomial tower of development

At the national level, the problem that can be solved by "commissioner tower", with attributes taken from the "Ministry of Development" is managed by a national data bank with regard to offer and inquiry between the system towers. This ministry should solve the following issues:

- to record the functional system of research (institutes, research centers, research groups, etc.) in the specific field of activity carried out on a certain domain (as possible offers);
- to register the public and private institutions of the society with specific areas of activities (as possible offers and inquiries);
- to structure the activity on specific domains, thus creating horizontal connections;
- to structure the global activity of the domains, thus creating vertical connections;
- to collect all inquiries and offers for certain domains;
- to harmonize inquiries and offers by vertical and horizontal connections between the towers of the base system;
- to provide fast networking between inquiry and offer, both in the frame of a certain domain and in the frame of the trinomial tower (at national level).

Thus, the data bank of the commissioner (of the MINISTRY of DEVELOPMENT) can be continuously updated and directed to the elements comprised in the development plans of economy and society, offering thus the basic short and long term direction of research. Based on the national data bank of inquiries-offers, fast solving solutions can be found for a demand – by valorization the national knowledge for solving a certain problem.

## ***5. Conclusions***

The research is important for the development of human society that ensure solving of economic and social problems, imposed by technical, technological and organizational changes aiming to people's requests in their desire to better and more in the sphere of knowledge and material problems.

Nowadays, when the rate of transformation of society requires a similar dynamic in the economy, it is necessary to find ways to harmonize this dynamic. The short way to harmonize the dynamic of the society with that of economy can be achieved only through research, where leading experts seek, investigate and invent new methods, solutions, variants,

structures which help in synchronizing the two elements of the trinomial development - the society and economy.

Increasing involvement of research aiming to the development of society and economy can be a trigger for their evolution. Without ideas, inventions, innovations and solutions, "things" remain as they are, without being able to provide functional correlation economy-society. Only research can boost ties between offer and demand (the reciprocal), the two basic elements of development.

If the research activity is complemented by a well-organized and structured commissioners, the dynamic development is more efficient and safer, this certainly being achieved by involving all possible forces (in due time) to solve and harmonize the offer and inquiry on the development market.

In these conditions, design of functional structures at the regional, national, continental and global levels are imposed, so to store and update the database of inquiries and offers. Thus, for any inquiry it is impossible to not find a proper offer of solving.

### ***References***

- Ardelelan, A., Dobrescu, E.M., Pisoschi, A. (2006) *Evaluarea activității de cercetare științifică*. București, Editura CA Bek.
- Brooking, A. (1998) *Intellectual capital*. București. International Business Press
- Calvest, J., Martin, B.R. (2001) *Changing Conceptions of Basic Research*. Workshop on Policy Relevance and Measurement of Basic Research. Oslo 22-29 October
- Cismaru, I. (2013) Research adaptation in eco-economy by efficient managerial methods. *Review of General Management* 18(2). pp. 38-48
- Cismaru, I., Brenci, L.M. (2014a) Complex trinomial system – basis for the management of the socio-economic development. *Review of General Management* 19(1). pp. 73-83
- Cismaru, I., Brenci, L.M. (2014b) *Comisionariatul de la trinomul plan la turnul trinomial al dezvoltării*. Sesiunea științifică 2014 a Academiei Oamenilor de Știință, București, mai 2014
- Cismaru, I., Brenci, L.M. (2014c) Application of the commissionership system to wood industry – safe and sustainable development way. *Revista Pro Ligno* 10(2). Pp: 34-39
- Pisoschi, A. (2005) *On Free Access to Scientific Information*. Policies of Science and Society Magazine. Vol. III(1).