

Zhideleva, Valentina; Sedusova, Natalia

**Conference Paper**

## Knowledge economy infrastructure formation in the northern regions of the Russian Federation

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## Knowledge economy infrastructure formation in the northern regions of the Russian Federation

When we consider knowledge economy as the top level of innovative economical development and the basis for the scientific knowledge, there is a need to make the favorable environment that might provide its efficient function. Knowledge economy that follows postindustrial society includes the increased quality of the human capital, increased life level, knowledge and high technologies production as well as production of innovations and qualitative services.

Human capital has become the key productive factor in creation of up-to-date new high technologies, production development, and their efficiency increase that leaves behind development of science, culture, healthcare, safety and social spheres. According to the United Nation Organization's report about the human capital development, the human capital ratio in the USA, Finland, Germany, Japan and Switzerland makes about 80 % of the national wealth. Fundamental research and development, increased investments into the human capital and hi-tech inventions precisely guarantee those countries the world's leadership.

Summarizing the results of the recent 20-years period of the Russian economy development, we have to take a note that, production efficiency and economy throughout Russia and its northern regions in particular hasn't increased, quite the opposite, has decreased in most cases compared to the soviet period results. Quality of the human capital requires increase of its technological characteristics. Creation of hi-tech productions with the high adding value requires first and foremost contemporary knowledge economy infrastructure that includes high quality of education, efficient fundamental science, venture business, high quality of human capital, knowledge and new technologies production, knowledge society, infrastructure for the ideas, inventions and researches transfer into production.

Contemporary economical basis of the Komi Republic is closely connected with extraction and primary processing of natural recourses, such as oil, gas, coal, bauxite, precious and semiprecious stones, timber logging, wood processing and pulp and paper production. Most of enterprises, as well as regional institutions of vocational professional training at all levels are located in the biggest republican cities – Syktyvkar, Ukhta, Vorkuta, Inta. About forty big-scale industrial enterprises: JSC “Mondi Syktyvkar”, OJSC “Syktyvkar Tissue Group”, OJSC “Komiteks”, Syktyvkar wood processing factory, OJSC “Komiaviatrans”, OJSC “Syktyvkar vodka and liquor producer”, Syktyvkar integrated industrial plant, etc. have their production facilities in the capital city of Syktyvkar and have the All-Russian importance. Syktyvkar – the capital of the Komi Republic is its public, educational, scientific and business centre where the

most of the population is concentrated. Six Institutes of the Komi Scientific Centre of the Ural branch of the Russian Academy of Sciences that make Research a Development activities in social and economical development, energy, geology, chemistry, biology, philology and history of the northern territories, i.e. the Komi Republic.

This is precisely why in 2011 Syktyvkar Forest Institute initiated establishment of Forest Educational Cluster in the Komi republic that in fact unites all educational institutions that provide professional training for timber industry and forest sector of economy. The Head of the Komi Republic, Vyacheslav Gaizer was of a high opinion about the new cluster: “Syktyvkar Forest Institute makes the integrated interaction with educational institutions that train specialists for timber industry, that will keep the system structure of higher education during modernization and consequently makes the new basis for its development”.

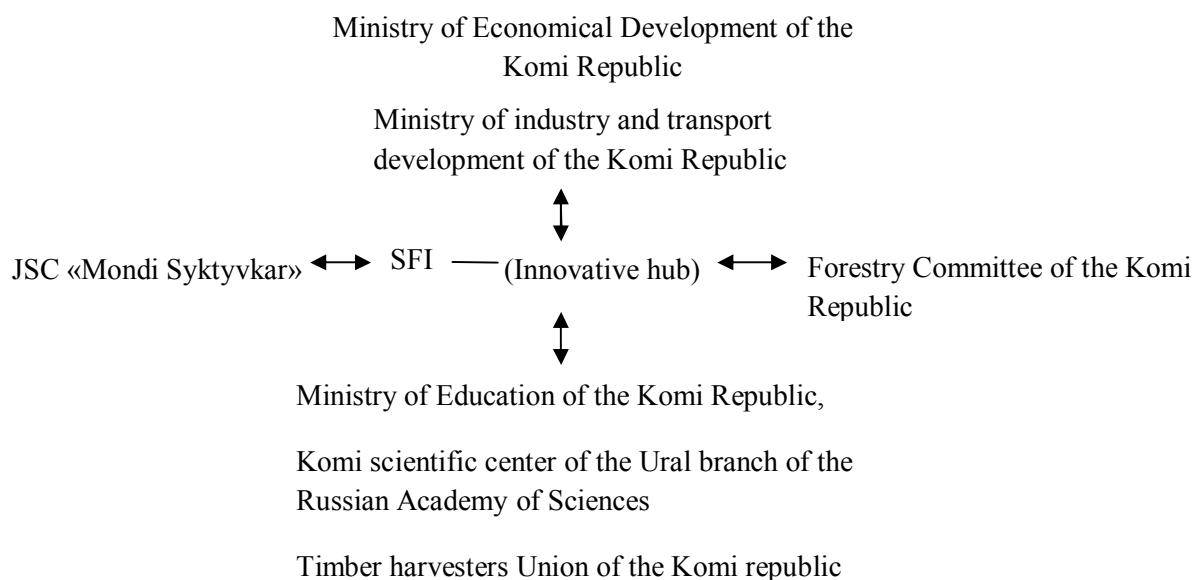
Forest educational cluster is a new structure for professional educational union in the Komi republic that was established on the international samples, results of some scientific researches of SFI professors that have started to study that issue since the 1990ies. Even at that time the cluster approach was considered as the most efficient and perspective for forestry professional training in Komi. Establishment of Forest educational cluster in the Komi Republic, was made on the voluntary basis of its members, it allows consolidating financial sources, teaching staff, educational materials in order to achieve big ambitious goals. Nowadays a lot of efforts are made to make the integrated, combined study plans at the Bachelor degree level, organization of further training for college teachers, there are lots of joint programmes and students’ activities. The educational cluster tries to improve the competitiveness of all the members, its efficient use of internal resources, concentration of all the partners’ efforts at the educational market.

In fact that was the first step according to the strategic development, so in 2015 Syktyvkar Forest Institute initiated establishment of the Innovative Hub in the timber sector of republican economy, as there is the strong belief that only by efforts of young people we can make the new economics in the Komi republic. International experience introduced by Massachusetts Institute of Technology (MIT) shows that for a complete technological implementation of the whole cycle of innovations there is a need in an “innovative hub”. According to its definition given by MIT a hub means “close networking of developers, technological companies, customers and suppliers”, a kind of center of business activities and confluence of economic interests that promote and inspire innovations. An innovative hub is supportive to new initiatives and the general “atmosphere” of innovations, it creates favorable environment for SMEs innovative

development. Syktyvkar Forest Institute can act as such as centre and the qualified teaching staff and students can be involved in the processes.

Technology of implementation of the whole technological cycle of innovations on the basis of Innovative hub can be described by the following scheme: *from the goal to the idea → from the idea to the concept (R&D) → from the concept to the prototype. (Innovative product. Business project) → from the prototype to production. Marketing. Pilot preproduction → transfer into the forest sector.* In order to implement the complete cycle of innovations there is a need of the *scientific-technological complex of the forest sector.* Implementation of innovations should be made with the use of Forest Cluster of the Komi Republic.

Implementation of the innovative hub on SFI basis (cluster approach):



Creation of the technological platform for timber sector of economy of the innovative system in development of perspective commercial technologies and new products (services) is made under condition of interaction and cooperation between business structures, research institutions, state organizations, society and can be used for sustainable forest management, forest use economics, recreation, tourism. The stakeholders in the republic are: "Mondi Syktyvkar" as a business company, research is provided by Syktyvkar Forest Institute, the state is represented by Ministry of industry and transport development and Forestry Committee, as well as public organizations.

The technological chain of innovative products creation is based on the model of “triple helix”, there is a synergetic interaction of three participants of the innovative process: state, business and science.

Establishment of the innovative hub can in the future provide additional advantages for the scientific-technological complex of the regional forest sector:

- Concentration of the staff and material resources in priority trends of development for forest sector;
- Protection and support of the scientific and pedagogical schools, assistance in formation and quality improvement of labor involved in the forest sector;
- Development of science in the Institute, creation of networking of study programmes;
- Development of material and technical facilities for the scientific researches;
- Creation of conditions to involve R&D results into economic activities;
- Formation and development of a wide-scale partnership of Syktyvkar Forest Institute with timber harvesting and processing companies and organizations that aim at improvement of innovative processes efficiency in forest sector of regional economy;
- Increase of financial support from non-budgetary sources;
- Assistance in management quality improvement at the Institute in order to implement innovative projects and provide efficient cooperation with business.

Evidently, research and development activities at Syktyvkar Forest Institute should be aimed at technological support of socio-economical development of forest sector in the region and it requires new forms of organization. Positioning of the institute as the innovative hub that makes technological platform for forest sector of the Komi Republic might become the highlight and a new brand of Syktyvkar Forest Institute.

In particular the innovative hub of the regional technological platform of forest sector might become an organizational structure that can provide a real opportunity to integrate the system values of the educational institution (i.e. SFI), state regional authorities and business structures and strengthens the role of Syktyvkar Forest Institute in socio-economic development of forest sector during the transition period and in innovative economy.