

Organizational and managerial aspects of Science and Innovation activities in Uzbekistan

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The start of the third millennium, in terms of the Science, has been marked with promising historic accomplishments for the civilization – genome studies, i.e. mapping of the human genome. However, paradoxically, at the same time, the mankind has faced a great number of global-scale problems, requiring ingenious scientific approaches and practical solutions to secure sustainable development: previously unexpected population growth, climate change, water and air pollution, extinction of some bio-species and break-down of ecosystem, desertification, degradation and salinization of the soil along with fertility loss and decrease in crops productivity- these are often linked with food supply deficit, famine, diseases, social turmoil, conflicts etc.

Social, economical, and cultural life of any society, securing its sustainable development has always been linked with scientific-technological progress and their efficiency, undoubtedly, clearly reflects welfare and intellectual state of the society.

Existing theories of the Science development, based on the features of the science itself (D. Price theory) as well as on the demands of the social production of the country (Lui de Brail theory etc..) at present require comparison and verification, due to the existing socio-economical, demographic and ecological situation in the world..

The leading countries of the world have already started investing significant funds into scientific research and innovation, realizing that solid returns and market gains can only be accomplished through implementation of the most sophisticated achievements of the science and technologies. However, the Science today, must not provide only generating significant economic benefits but also deliver sustainable development of the society.

In this context, questions of studies in organization of research and innovation activities in countries with transition economies is becoming extremely relevant. Apparently, achieving significant progress in development of science and technologies, innovation entrepreneurship in CIS countries is rather difficult at the moment. This problem traces far back in its origin and is connected with orientation of the Scientific research agencies in the former USSR to carry out military-industrial orders with limited opportunities for independent introduction of new products into the market. It was one of the major disadvantages of the centralized control system in the sense of scientific development. Socialistic model of production did not maintain a well-formed back-up infrastructure of horizontal links between industrial enterprises, scientific and financial organizations.

Nowdays, State bodies of social control in the countries with transition economies are facing difficult problems concerning coordination, management of the research activities, identification of priorities of the science development in market competition. There have been issues of establishing criteria, forms and methods of financing the science, taking into account that expenditure onto the science, similarly as any other activities during transition, can't grow endlessly. Very important that state –supported scientific programs and projects must be closely linked with, on the one hand, their public application and efficiency, and on the other hand , with ethical norms of research conduct, sever competition in the world market and resolution of regional problems.

Nowdays, government and public in most countries of the world are seriously concerned with deterioration of ecology, living conditions, brake of the balance between consumption and renewable mineral resources. Their economies are consuming so much recourses, that the Nature simply can't renew, particularly in those parts of the globe, that are experiencing demographic problems. Every 10-15 years there is doubling of the load on the nature. Some 98-99% of extracted row materials are exhausted in the environment. The effect of non-rational use of natural recourses, environment pollution with xenobiotics, i.e.. elements that are foreign to the nature, may gradually and imperceptibly increase so much that will cause the loss of ecological sustainability and create emergency situation that, in its turn, will raise issues of eco-genetic safety of Homo sapiens i.e. survival of the mankind and other biological species on the Earth.

Scientific policy of the state , apparently, must aim at elimination of causes of break-down in ecological balance, rational use, comprehensive reprocessing of the resources and raw material supplies, their interchangeability; at the re-orientation of production from one type of raw materials to another. To ensure sustainable development, there is a need to restructure the use of the resources, to minimize the share of non-renewable resources in the total amount of the recourses and energy consumed through implementation of the renewable and other sources of energy: the sun, wind, water etc.

Apparently, it is the right time to raise the issue of resource saving; efficient processing and rational use of natural recourses, wastes and secondary resources the priority for the modern science of all countries. This problem can be resolved through targeted coordination and management of scientific work.

At its current stage, the science involves complexity and peculiarity of the short-term and long-term problems to be resolved to ensure sustainable development of the world community. And this fact makes the governments of the countries, in particular, countries with the transition economies, take a special approach to devise own scientific-technological policy as well as to

formulate the strategy of the development and methods of efficient management of the science to ensure sustainable development.

Forecasts for the development of the enterprises in the market economy that are based on the analyses and the strategy to determine their chances in future, eliminating threats, risks for the public, anticipation of the key issues that in the long-term period, will ensure the progress of socio-economical development in the conditions of the severe competition.

Now, the enterprises are looking at the scientific and innovation activities as at the close system that only implies gaining the most possible benefits from the projects, and this fact doesn't fit and moreover, completely contradicts the principals of the sustainable development.

As it is well known, innovation enterprises, to be a success in the market, must not only produce good products but also develop and advance communication policy, major components of which is timely and regular information of the results scientific activities, on the organization, research staff, promising innovation projects, goods, commodity etc. Adequate output from innovation projects in the West is considered again in the capital at 10 times within 5-7 years. However as much as only 5% of the Research and Advanced Development (R&D) cost lead to the new, marketable goods.

Naturally, a company that is looking forward to the foreign or State investments is trying to indicate the best numbers of its business, or any other, activity, because it is interested in its own good image regardless of the interests of the public.

Here, what is peculiar and most difficult is the point of the management of the scientific activities that comes from the social sphere and is facing some difficulties while structural market reforms. Success in this area depends on the scientific-technology policy and national program of the development of science and technology together with globalization of the development process.

In Uzbekistan, like in many other countries, the science is sponsored mainly by the State. In 2002 the edict of the President «On improvements of the organization of the scientific-research activities» made our Republic the first among the CIS countries of the Central Asia that came to the competition in scientific work, that fully fits market economy principals. To make the management efficient, the Coordination Council under the Government that is the senior coordination body on scientific-technology activities in Republic of Uzbekistan was established.

Coordination of the development of the Science and Technology in Uzbekistan is performed according to the simple and pretty clear chart (Fig. on the page 7 and 8):

a. Parliamentary level. Committee on the Science, Education, Culture and Sport (Elaboration and adoption laws, legislative acts etc. together with the organizations, enterprises, research staffs, as well as carry out of monitoring of their observance and timely application).

6. Government level. Coordination Council on Development of Science and technology under the Cabinet of the Ministers of Republic of Uzbekistan chaired by the Prime-Minister.

Executive Body of the Coordination Council are:

1. The Center on the Science and Technology;
2. The Council on the appraisal and expertise of the scientific and innovation projects.

The main executive sectors of the Scientific-research projects and state programs are:

-Academy of science with research institutes, Centers, laboratories, scientific production enterprises, unique scientific-research units, etc.;

-Ministry of Higher Education. The Ministry with institutes of higher education having scientific-research colleges, departments and etc.;

-Branch sector of Science. Ministries having research institutes, Centers, laboratories and etc.;

-Higher Examination Board;

-State Patent authority.

The nominants to the CC are approved by the Edict of the President of the Republic of Uzbekistan and chaired by the Prime-Minister of the Republic. In the framework of the CC there are sections corresponding to the priority fields of science, employing the leading scientists and specialists of the country in compliance with the activity of each section. Some of the activities of the CC aim to ensure sustainable development of science and technology in Uzbekistan.

Supporting science every state expects the return of the investments, aims at strengthening its positions, thus establishing its own independent technological market for sustainable development of the society. In these conditions state authorities investing in science need a systems analysis of the results of scientific researches, projects, and state programs on the Governmental level.

Taking into consideration the importance of this problem the Government of the Republic of Uzbekistan entrusted the CC with the solution of problems in the sphere of scientific and technical policy, particularly:

- to determine the short-term, medium-term and long-term priorities of the fundamental and application scientific researches and technological development in coordination with the strategy of the economical and social development as well as the structural reforms in the country's economy;
- to approve of extensive scientific programs and technological projects corresponding to the state priorities of the social and economic development of the country;
- to determine the direction of use of funds of the Foundation of financing of the scientific, technological and innovation activities.

As is well known when new goods or technologies are introduced to the market enterprises, especially in countries with transitional economies, run the high risk. Naturally, they need government support. Many companies and enterprises often have to solve the question, whether it is reasonable to enter the local market with a completely new product? The risk level varies greatly and is directly related to the degree of the novelty of the product or technology. It's not a secret that the newer the product the higher the uncertainty is that it will be accepted by the market.

The main omissions while introducing new products to the market are considered to be:

- inadequate analysis of the external factors of the environment the business operates in, trends of the market development, competitors' behavior;
- inadequate analysis of the internal innovation, production, financial and other potentialities;
- ineffective marketing and insufficient (or unprofessional) support of the new product introduced to the market.

For successful solution of these problems CC considers and approves programs of fundamental research, state scientific and technological programs of applied research, technological and innovation development. The peculiarity of these state programs is that they reflect priorities of the economical development of the country, include the main indexes and indicators of its sustainable development, in particular, development of education, community health protection, water, geo-, and bio-resources conservation, recycling of dangerous industrial and domestic wastes, control of soil desertification, erosion and salinization, demographic problems, and others. Such state scientific programs are associated with the industrial and economic activity of enterprises, firms and companies that are formed on the basis of proposals of regions, enterprises and organizations.

The problem of fundamental improvement of control of science, technology and innovation business development as a factor ensuring sustainable development, is of a particular interest for countries with a transitional economy. Economical reforms, pace of development to a great extent depend on government support of small and medium-scale business that are basis for forming large-scale

companies, firms, for the development of innovation activity.

According to the formula accepted by the Organization for Economic Cooperation and Development (OECD), innovation is a transformation of ideas into the market goods or services, into a new or better manufacturing process or into a new method of rendering of social services.

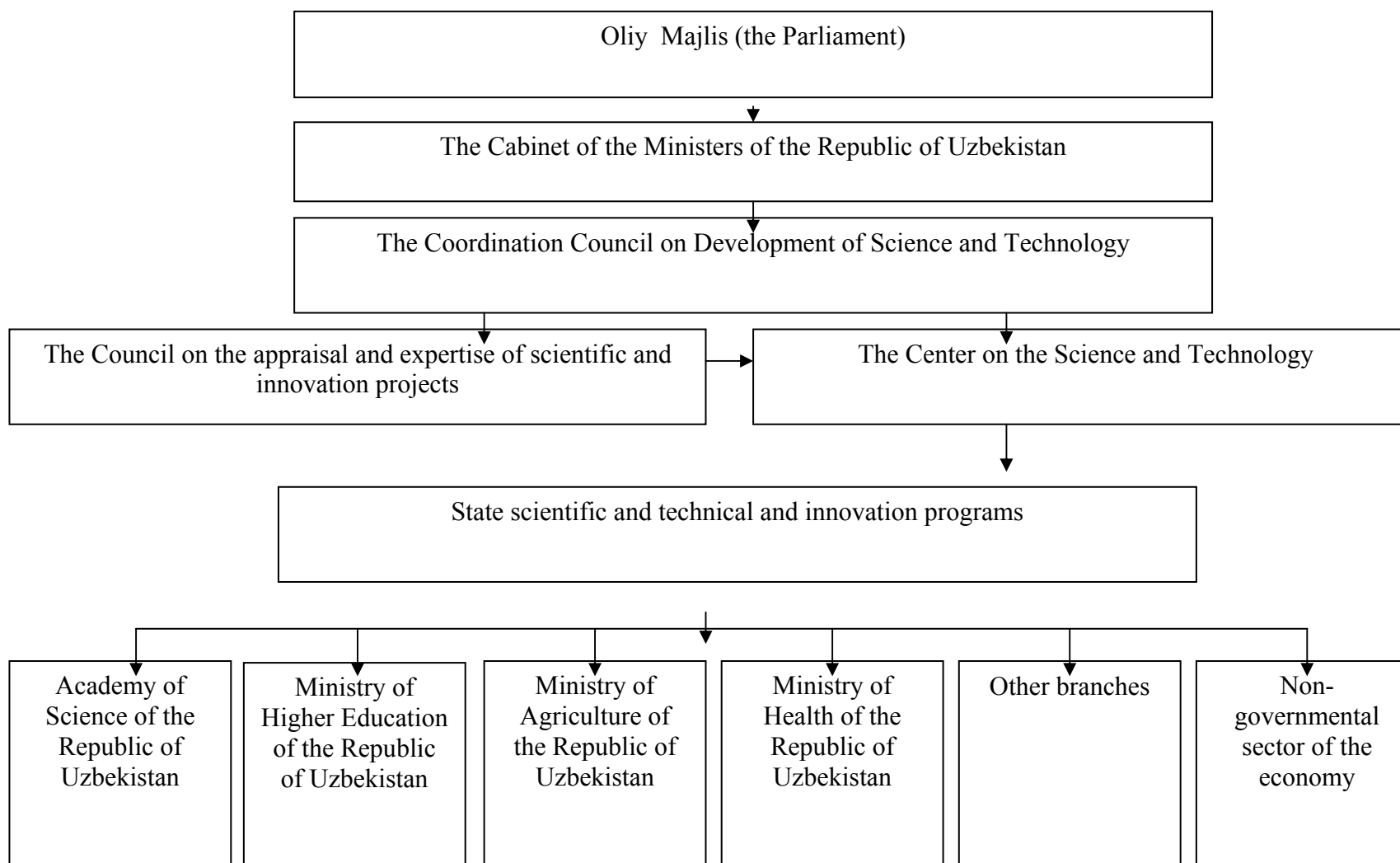
Small scale innovative entrepreneurship in industrialized countries is an innovation enterprise, arranged by the researchers, engineers and inventors, that aims at elaboration, exploration and commercialization of competitive scientific-technological ideas that are to be at the forefront of the scientific progress. At the same time they are the object of investments, with risk and uncertainty being the highest. But, nevertheless, consuming some 2 - 5% of total funds spent on the R&D, small-scale business in the US and Western Europe produces as much as 50%, being a licensor of 50% in the world market. At the beginning of the transition to the market small-scale business in Uzbekistan, because of limited financial resources, started forming as a private entrepreneur, enterprise, firm of smaller staff. Formation of the small-scale business in these conditions is chaotic; it can't be managed while searching for the new directions of business taking into account traditional features, demand and supply of the regions. The key part while formation and development small-scale innovation business, together with infrastructure of support of innovation enterprises, is institutional structure of sustainable development of the country.

According to the experience of the leading countries of the world, formation of the innovation enterprises is closely linked with development of venture (risk) financing. In broader sense it implies all investments into financially risky projects, first of all in the area of high technologies. In narrower sense, it means that long or medium term investments as credits or stocks carried out by venture foundations to set up small scale fast growing technological companies. More often all lower risk (or venture) enterprises are connected with scientific sphere, that is why they are defined as "small scale innovation enterprises".

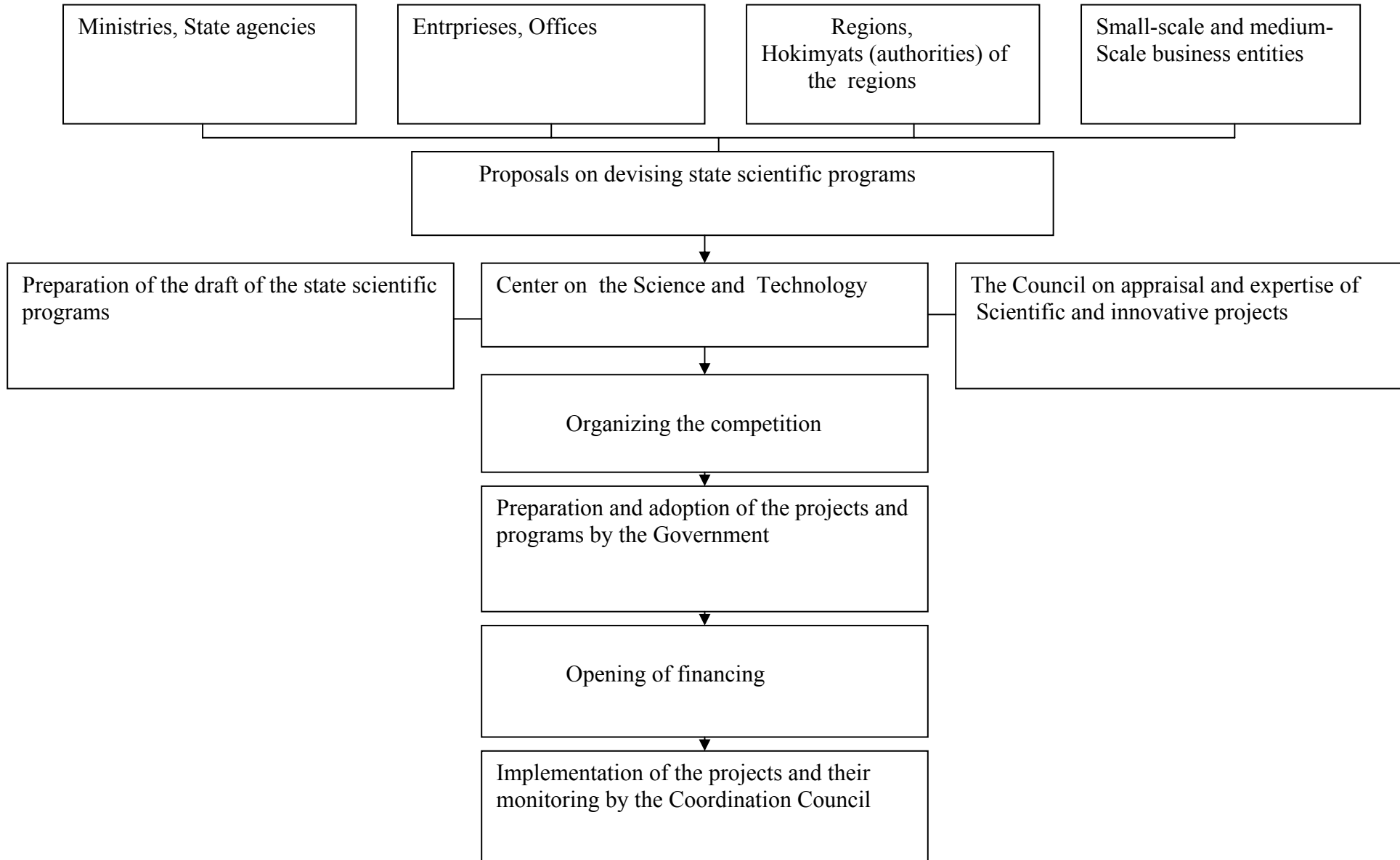
The US experience on management and support of innovation business shows that transient organizational structure towards innovation business is small scale innovation firms backed up by the venture financing (direct funds of individuals and entities). Venture financed firms are still being set up in the US to fund innovation business. European countries started creating this type of firms back in 80th. Total number of innovation firms in the US throughout 1986-1996 increased from 53700 to 88400, e.g. grew up by 1,6 times, and in early 2000 accounted for 100 000.

In Russia formation of innovation business was associated with creation of scientific technological cooperatives and State scientific centers; the latter gathered a significant number of researchers, engaged in intensive researching work.

The structure of coordination of the development of the science in Uzbekistan



The system of organization of the scientific research in the Republic of Uzbekistan



Our republic looks at the development of the entrepreneurship, including small scale and medium scale business, as one of the most important directions of economic reforms, as a factor of economic growth. Many organizations of our republic took the way of foreign companies, e.g. started creating specialized innovation division which are dealing with manufacturing of production pieces of new equipment in a short run. This approach is good enough, because it makes scientific research work closer to the problems and potential of the principal manufacturer and consumer's needs. Second, innovation enterprises can attract the best researchers and third, be more confident in keeping commercial secrets of the enterprise. For such enterprises the government of Uzbekistan creates an environment adequate to this task, provides financial assistance to priority venture development. As experience shows, establishing of interaction between government and small innovation companies contributes to mitigation of contradiction between the huge unclaimed scientific potential and the necessity to reform cardinally the technical basis of all sectors of national economy.

Forming of innovation business in the Republic is accompanied by the creation of foundations of innovation business development in two directions: first, through the creation of state and self-supporting centers (regional), and second, through establishing a risk capital for financing of innovation projects, that are usually implemented by small-scale companies. The form and content of the second direction is close to USA companies of venture capital; however, the distinguishing feature of venture capital in Uzbekistan is that both public funds and off-budget funds of non-government sector are at risk.

The new mechanism provides for, as an element of market relations, the return of non-governmental funds from profit and a number of tax remissions, that are used for reinvestment in new promising innovation projects.

The peculiarity of innovation program in Uzbekistan is a clear and specific determination of functions and responsibility of all participants of innovation activity, type of the used scientific technological innovation. I should stress the short-term nature (not longer than 2 years) of the projects implemented by innovation enterprises.

The programs as a rule aim to preserve nature, people's health, use renewable sources of raw material to the maximum, processing of local raw material resources and wastes, get a fast payback of the invested funds.

One of the effective mechanisms of manufacturing application of high technologies, producing advanced technology, competitive products, strengthening links between science and production is establishing scientific production laboratories, scientific, technological and innovation centers in addition to branches of production and production associations.

These centers have been established on the basis of the existing but not used in corporate production facilities of the Republic, that provided an opportunity to join within the framework of innovation programs the technical potential of the enterprises with the intellectual potential of scientific research organizations and institutions of higher education. These enterprises develop an innovation technology, create an experimental-industrial model, commercialize the process.

The mechanism of government support of research and innovation activity of small scale enterprises, practiced in the Republic, has already given certain results. Small scale enterprises begin to produce new, high-quality products, and compete with large-scale enterprises and importers. Thus the transition of the Republic of Uzbekistan to the new system of science control adapted to the conditions of market relations has provided a democratic basis for the development of scientific activity. The established public institutions allow on the governmental level to concentrate and direct the scientific and technological potential of the Republic to the solution of social and economical problems and to introduce into practice achievements of domestic science and technology, and promising high technologies that are to provide sustainable development of the Republic in difficult conditions of market economy.