FROM THE AUTHOR OF "NO RIGHTISTS NOR LEFTISTS"

Dr. Nursultan NAZARBAYEV:

RESOURCE-SAVING STRATEGY AND THE TRANSITION TO A MARKET ECONOMY

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PREFACE

This monograph was written by Nursultan Nazarbayev, the President of the Kazakhstan Republic, during the period of radical economic reforms in the Confederation of Independent States. Specialists and lay readers alike have expressed considerable interest in the conclusions of this work.

Resource-saving strategy is described as a general pattern of qualitative economic growth. The author's investigative work in this field and his conclusions about this important problem reach far beyond the scope of Kazakhstan itself. The formation of a market economy requires an in-depth strategic approach to solving scientific, technological, economic, and social problems. A complex concept of orderly market formation, which is relevant for both the present and the future, is based on a program which relies on intensive resource-saving reproduction as a key factor in production conversion.

Fundamental problems for a market economy – production development and expansion, and the normalization of the commodity market - have often been overlooked. President Nazarbayev analyzes the processes of resource-saving and optimum resources consumption, including the economic, organizational, social, and ecological aspects of the field. The author has worked in engineering, conducted economic investigations, participated in economic ventures, and has acquired experience in state management and politics.

Enacting a resource-saving policy is extremely important not only for Kazakhstan with its vast potential, but for other Confederation of Independent

States (CIS) nations as well. For many years, the economy of these states developed on a wide-scale, high-cost basis. This method of economic management is no longer effective, and has become a serious obstacle to increasing production. We must consider the worldwide significance of the indicated problems. In fact, in the near future many states will face a shortage of natural resources, raw materials, fuel, and other resources. Meanwhile, as the international conference in Brazil (June 1992) demonstrated, a number of countries are indifferent to the economical use of manufacturing waste. Moreover, they have made no effort to introduce economical and waste-free technologies, often allowing raw material resources to be squandered. The author of this monograph warns us of the growing danger of ecological catastrophe. He calls for a rational, ecological, and socially useful utilization of all resources.

President Nazarbayev links specific lines of investigation and recommendations to property privatization. The process of privatization in Kazakhstan is, in our opinion, of practical interest to other states as well. At the same time, resource-saving is considered to be an objective principle, related to the qualitative transformation of the production structure and its material and technical foundation. This monograph pays particular attention to the formation of a new economic market, which will promote the social reorientation of the economy, based on an efficient use of manpower, material resources, production potential, and investments.

Without denying the value of earlier scientific studies, the author states that a more profound analysis of the problem and the development of scientific recommendations are required in order to implement the following fundamental resource-saving measures: instituting new trends in scientific and technical policy based on recycling; forming an economic market mechanism which will increase production and make the economy more responsive to social needs; creating economic interest and responsibility in all market areas, starting with commodity producers, which will be designed to save resources and achieve the best economic results at the lowest cost.

In our opinion, this monograph is a serious attempt to analyze the indicated trends of resource-saving strategy and optimum consumption of resources, and to relate them to economic reforms. The author's recommendations are of particular value for the creation of market relations .

Prof. A. Bachurin, D.Sc. (Econ.)
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INTRODUCTION

The most important task facing Kazakhstan today is stabilizing the economy and ensuring continued economic development.The efficiency of all social and political reforms depends on this. Kazakhstan's economy was created as a component part of the unified national economic complex of the former Soviet Union. Naturally, the disintegration of stable economic ties has had many adverse effects. Therefore, time and in-depth scientific studies are required to create a series of new and more rational relationships between enterprises and production branches, both within the republic and on a larger scale. There exists the possibility of establishing an efficient economic regional complex. In this respect, the issue of resource-saving deserves particular attention, its being the most important factor in increasing the efficiency of social production and raising the standard of living. There is reason to believe that this type of economic management, while achieving progress in market relations, is exactly what will enable us to realize positive results with less input and in the least possible time.

The principal avenues for resource-saving at the lower levels of the economy are generally well-known. Among them are the problems of reducing material input per unit of production at the expense of more constructive economic decisions, and the wide application of resource-saving engineering and waste-free technology; reducing the loss of power and material resources during the production process; recovery and utilization of all waste materials, secondary heat resources and garbage; and complex processing of primary raw materials

and natural resources. The most efficient economic key factors and incentives for resource-saving must be found and applied at each production bay and work collective.

It is much more complicated, however, to formulate specific recommendations and strategic methods of resource-saving for the economy of the republic. How can its structural dynamics attain the greatest efficiency? What are the best ratios of accumulation and consumption to resource-saving reproduction? How do radical changes in the economic mechanism, the issues of public vs. private property, and the development of market relations affect the resource-saving process? These problems and many others require a comprehensive study of the Kazakhstan economy as it relates to general trends in worldwide development. A scientific concept and a long-term program for optimum resource consumption are essential during the transition to a socially-oriented market economy. Here, mutually advantageous relationships between the states must be maintained and developed.

The resource-saving reproduction function grows during economic reforms, and the ratio between consumption and accumulation of national income changes. In the republic's reserves, the portion of production accumulation formed through resource-saving acquires ever-increasing significance. Therefore, to provide far-reaching reproduction over time, it is very important to implement the mechanisms of resource-saving accumulation. Optimization of accumulation is a strategic parameter of reproduction which guarantees a new quality of economic growth based on resource-saving.

A qualitative reform of the material and technical foundation of our economy can be realized both by technical re-equipment and reconstruction and by new construction. Here, policy makers must take steps to ensure that no form of reconstruction becomes a dogma. That is why a long-term program of resource-saving production development is so important. It must reflect the dynamics of the strategic resource-saving parameters, inter-branch structural improvements, and achievements in science and technology.

Resource-saving must, in fact, become one of the principal sources of efficient economic growth. It is known, for example, that saving raw materials and energy costs half as much as producing the same quantity of materials or energy. However, the transition to resource-saving production development is extremely slow. In previous years, an average rate of resource-saving technologies in the former Soviet Union was three times less than in the United States. Unfortunately, this gap is still growing.

Raw material resources are lost at the production stage. In addition, metals, building materials and other products are lost or wasted at machine shops, during construction, and elsewhere. Secondary resources are also used poorly. That is why specific consumption of materials per unit of national income is twice as high in our republic as in the countries which consistently practice resource-saving.

Widespread intensive recycling requires the most rapid modernization of production on the basis of the latest resource-saving technologies. In this respect, it is particularly important to analyze the social production dynamics in terms of specific consumption of materials. We believe that Kazakhstan must find the best alternative for economic growth under market conditions and that other resource-saving mechanisms should be taken into account.

The most important elements here are the optimization, specialization, and location of social production. Investment policy should be fundamentally revised and accumulation norms should be determined with regard to the intensive development of the economy and how to solve social problems. Specific resource-saving programs are required at all levels of the economy. It is hard to agree with the economists and politicians who rely exclusively on spontaneous market relations and deny the necessity of using powerful tools such as planning and forecasting. Conducting a bureaucratic and centralized evaluation of all the parameters of socioeconomic development is naturally out of the question. Here we must determine the strategy and principal economic ratios which enable the economy to function efficiently and guarantee the welfare of the population. A consistent resource-saving program also requires state regulation which employs planning and forecasting methods.

The economic reform, which is being implemented with the development of market relations, will play a major role in efficient resource-saving, along with a structural revamping of the economy, on-going acceleration of scientific and technological progress (STP), and reviving production. Entrepreneurial initiative, fair competition in the public and private sectors, and proper economic management work to stimulate the economy, lower production costs, and increase worldwide profitability . These factors, however, cannot be realized on their own. They require routine organizational activity, and highly qualified managers and workers. Therefore, Kazakhstan needs to institute a program for intensive businesslike personnel training, and must inform businesses about the best domestic and foreign resource-saving expertise.

Efficient financial and credit policy also has great potential. Enterprises

should take full advantage of both in-house capital funds and loans. Indices for efficient crediting of resource-saving development include payback time, the effect of the accelerated introduction of resource-saving equipment (technology), raising the returns on assets and reducing the specific consumption of materials, and the dynamics of the level of profitability as a result of resource-saving measures. In this case, it is necessary to carry out a reasonable interest-bearing policy, so that the interest on credit will continue to stimulate production and resource-saving development.

Economy of material resources becomes a general problem not only in light of natural resources consumption. Environmental pollution is growing, and Kazakhstan must take steps to rectify the ecological situation, especially in the regions, where extractive-industry, metallurgical, and chemical plants are located. More than 1.5 10 tons of solid mineral resources are mined annually in the republic. Slightly more than 4-8% of the resources go into the finished products, and the rest goes to waste. This wastefulness causes tremendous economic damage. The social aspects of nature protection are no less important. The community often pays a high price for not having implemented ecological measures.

Calculations demonstrate that a combined use of raw materials at Kazakhstan's mining enterprises alone will make it possible to increase finished product output by 25-30%. There are vast reserves of resource-saving in other branches of the national economy. Maximum utilization of these reserves will considerably increase Kazakhstan's economic potential.

Each ruble of capital investments used for processing secondary material resources can produce more than 13 rubles' worth of products. All economic resource-saving measures must make every effort to conserve Kazakhstan's unique natural resources for future generations.

This monograph uses previous experience to analyze resource-saving problems. The first years of economic reforms and the republic's prospects for socioeconomic development are taken into account. As reflected in its treaties, Kazakhstan is a sovereign state which wants to maintain and develop mutually advantageous economic relations with neighboring states, primarily Russia.

SECTION I
RESOURCE-SAVING AND THE CREATION OF MARKET RELATIONS

CHAPTER I
OPTIMUM SAVINGS OF RAW MATERIAL RESOURCES

Economic reform and the transition to a market economy provide people with the economic freedom that gives them control over the means of production and the results of their own labor. Under these conditions, as experience all over the world has demonstrated, instituting full-scale market relations promotes scientific and technological progress and the transition to resource-saving economic development.

An economic mechanism represents a certain sphere of production relations, which regulates expanded reproduction, provides for economic interests and accomplishes public vs. private means of production. The scientific category "economy" occupies a particular place in such an economic mechanism. [1] It is characterized by the economical use of productive, material, and financial resources, and a reduction of unproductive expenses in all spheres of the national economy.

Savings of resources is the decisive factor and the most important function of the economic mechanism in a mixed economy. However, in Kazakhstan and other countries of the former Soviet Union, resource-saving has not yet become a global, strategic line of economic growth, especially as regards material production. We utilize resources inefficiently. Thus, even though in 1990 Kazakhstan produced several times more of the most important types of products than did the United States, our national income was only 64% of that of the United States, while metal consumption was two times higher. According to available data, reduction of specific consumption of materials in our aggregate

product has is extremely significant economically and will enable us to save hundreds of billions of rubles. Specific consumption of materials and energy leads to large-scale mining and processing of mineral resources. This gives rise to huge volumes of dead rock, ash, and slags, as well as air and water pollution.

With few exceptions, mineral deposits are not completely exploited. In the former Soviet Union (26% of the world output) only 10% of annual output is used in useful products. A number of mineral resources are extracted with very low indices. Metal consumption for machinery is very high in Kazakhstan. Calculations of NIITmash indicate that on average, our machines are approximately by 20% heavier than the best comparable foreign machines. In early 1990, in ferrous metallurgy, a key branch of industry, 30.2% of steel was lost during rolled stock production. Elsewhere these figures are 18.4% in the United States, 9.4% in former West Germany, 5% in Japan, and 1% in South Korea.

The problem of formulating a concrete estimate of mineral resources is widely covered in the economic literature. Saving these resources as a category of reproduction through STP and market economic management is discussed less often. We need to investigate the different aspects of material resource-saving. We consider this to be a complex category, which represents a scientific reflection and abstraction of the development of social relations as part of production. Theoretical consideration of the category of "economy" makes it possible to better understand its essence, role, and functions. After understanding the theory of problems and clarifying the methodology for the economic analysis of this category, we may proceed to investigating the practical aspects. This is fundamentally important for creating optimum savings and providing for the people's welfare.

In the economical system, progressive production relations serve as an incentive to develop social productive forces and to save raw material resources. In their turn, highly developed productive forces form a material basis for economy. The latter reduces labor input and production costs per product unit, improves all economic indices, increases accumulations, and paves the way for a transition to resource-saving development.

Scientists consider the use of the country's raw material resources as one of the main components of productive forces. The higher the qualitative and quantitative levels of the productive forces, the less labor and material resources are spent for obtaining an appropriate saving. The productive forces under investigation include raw materials and power resources. In order to mine,

produce, or transform these subjects, labor is used. Put differently, "any raw material is a subject of labor, but not any subject of labor is a raw material. A subject of labor is a raw material only if it has already undergone a particular change by means of labor." [2] For example, rational use of natural raw materials predetermines savings in ore-mining production. At the same time, its dynamics are dependent on the level of development of productive forces and social relations.

Raw material resources are a vital element in wide-scale and long-term recycling, and an objective precondition for the development of material production branches. At present, the proportion of mineral resources (by weight) in the general volume of raw materials that are used equals 75-80%. Mineral raw materials account for more than 95% of the output of electric energy and heat, 90% of the production of heavy industry, and 20% of consumable goods. As many raw materials were mined in the world in the last 25 years as were mined in the entire history of mankind. According to specialists' estimates, worldwide industrial production (in volume) will grow by 2.5-3 times before the end of the century, relative to now. All this has considerable impact on economic efficiency and the ecological situation.

The role that nature and raw materials have played in the development of society cannot be underestimated. "To substitute human labor for natural forces is, generally speaking, an impossibility. Both in industry and agriculture, a man can only use the action of natural forces if he understands how they work, and he uses them in conjunction with machines, tools, etc." [3]

The growing interrelationship between the effective use of raw material resources and the resource-saving model of society development is a law-governed process. It is determined by the need to radically improve production relations and is characterized by a tendency towards the optimum growth of the demand for raw material resources. This demand controls raw material production, which then increases the potential of saving. A growth of production and consumption of raw materials is now universal and is a trend in world economic development. Thus, according to experts working for the United Nations, between 1970 and 2000 world consumption of mineral resources is dramatically increasing. Experts predict that the demand for copper will increase by 4.8 times; for bauxites and zinc, by 4.2 times; for nickel, by 4.3 times; for lead, by 5.3 times; for iron ore, by 4.7 times; for petroleum, by 5.2 times; for natural gas, by 4.5 times; and for coal, by 5 times. In this case, the growth rates of raw materials consumption will exceed the growth of the gross domestic

product [4]. This ratio demonstrates that the material resource-saving is a worldwide problem. Efficient resource-saving is an urgent problem on the local level as well. This is particularly typical for Kazakhstan. Here, according to statistical data, the national income increased by 1.79 times in 1970-1990 (in comparable prices), while petroleum production increased by 2.1 times; gas, by 4.3 times; and coal, by 2.3 times. Continuously increasing the dynamics of specific consumption of materials in the national income adversely affects social production.

Defining the savings of raw material resources as a scientific category reflects a qualitative development of production relations and productive forces. It can be characterized by "potential" (PS), the degree to which these resources are used efficiently, on the basis of scientific and technical progress. Potential is a quantity of savings which in the future can be obtained from the maximal use of all production factors. In a broad sense, it describes means, reserves, stores, and sources, which are available and can be activated in order to attain a certain objective. This means that potential reflects actual possibilities and capacities, which can be used in the production of goods and services. We think it important to complement this notion by a measure of reserves realization. Achieving the greatest result is one of the important directions of social and economic reorganization in Kazakhstan. This raises the problem of developing a methodology for estimating savings potential at different levels of the national economy, oriented to achieving the best possible results.

In practice, put in the most general terms, the optimum resource-saving will be determined by its maximum (SM), measured by economic methods, and in ratio to the required minimum capital investments (CI), i.e.

$$PS = SM/CI \qquad (1)$$

The savings potential of raw material resources is a complicated category, and is the result of many factors. These factors affect both the value of the obtained savings and the expenses. The latter must be minimal and includes savings of labor (productivity enhancement); current cost savings (reduction of material consumption); and savings of capital costs invested in basic production assets (enhancement of yield per unit of assets). This dependency implies that model (1) will describe an optimum savings of material resources, based on certain premises. The model shows that not all types of savings are optimum for the national economy, but that a savings of labor can compensate for additional

expenses for materialized labor in the shortest possible time. Conversely, the potential is lower if the dynamics of material resource-saving lag behind the growth of capital costs for mining and utilization.

The potential of optimum material resource-saving is determined firstly by the volume of the resources, including both resources that are recycled and those that are not. For example, in Kazakhstan, the balance stock of iron ores amounts to 4852.5 million tons and overbalance stock amounts to 10775.7 million tons. The stock of manganese ores equals 45.8 million tons and the stock of chromite ores 399.1 million tons. Secondly, the potential is determined by the society's actual capacity to use the available raw material resources and create a maximum of material values. It is also affected by the radical economic reforms that are taking place today.

The content of the potential, as an optimum savings, must reflect not only the material resources used by the society. It is essential to consider the various possibilities for the potential itself to grow, and there are considerable reserves in this area. For example, in oil and gas production in West Siberia, up to 16 billion cubic meters of casing-head natural gas and condensate burn out annually. In foreign countries, the casing-head gas is collected from almost every well.

Kazakhstan produces 1.5 times more oil and gas than the United States, and 5 times fewer synthetic resins and plastics. A relative share of rolled steel production in the former Soviet Union is 79% as compared to 81% in the United States, 92% in France, and 95% in Japan. When cement is produced with the dry method, usable materials account for 15% in Kazakhstan, 56% in the United States, 90% in former West Germany, and 78% in Japan. The figures for the melting of high-quality basic oxygen steel and electric steel are 44% in Kazakhstan, 93% in the United States, and 100% in Japan, France, and former West Germany.

In Kazakhstan more than 1.5 billion tons of solid mineral resources are extracted annually, a third of which (534 million tons) is used in metallurgy. However, slightly more than 4-8% of the extracted raw material turns are used in the finished products, while the rest is wasted in the form of overburden rock, tailings, and slags. Garbage dumps are accumulating, occupying large areas and creating pressing ecological problems. Waste plays an insignificant part in the national economic turnover: 5.6% in nonferrous metallurgy, 3.3% in ferrous metallurgy, and 5.2% in the coal industry.

Annually, nonferrous and ferrous metallurgy consumes between 4 and 14 per cent of power, material, and mineral resources. Almost half of all the

extracted mineral resources are mined in the republic. However, the finished product output does not exceed 5-20% of the initial raw material and the rest (80-95%) goes to tailings and garbage dumps.

The analysis of resource-saving in nonferrous metallurgy has revealed huge reserves. For example, for secondary material and technical resources Kazakhstan has already achieved an annual savings of 12% of electric energy, 9.1% of petroleum products, and 4% of metallurgical and petroleum coke. Ninety per cent of aluminium scrap and waste are being processed, as well as 50% of copper and its alloys, and all other waste and scrap from nonferrous and rare metals. More than 16 billion tons of solid waste are accumulated in Kazakhstan. With an annual output of 1 billion tons, slightly over 6-7% is used in the national economy. Using these wastes will enable Kazakhstan to sharply increase the resource-saving efficiency, by saving capital and working costs on prospecting, mining, and processing of mineral raw materials. As a result, the resource-saving potential would increase considerably in Kazakhstan, as would the efficiency of the entire national economy.

Thus, Kazakhstan's natural resources are a major starting point for the formation and renewal of the resource-saving potential. Here we include stocks of natural resources, which need to be studied further, and anticipated stocks of natural resources. Accumulated natural resources are the basis for material resources formation. They differ from one another in that natural resources are created by natural forces, and formed by human labor. Therefore, resource-saving potential expresses a dialectical unity of the objective and subjective components. The objective component is a combination of material and natural resources.

One part of raw material resources, which is involved in the production of material goods, comprises a realized portion of savings potential. It represents the growth of society's productive forces and describes an active component of the potential. In addition, the potential includes a non-realized element which is a combination of material and natural resources, which, for one reason or another, have not been used for a certain period of time. This category includes mineral resources which were prospected but not used. Therefore, it is important to place a quantitative estimate on real and unused components of savings potential. For this, it is necessary to define a total volume of raw material resources and a combined ability of the society to use them and to create a maximum of material goods. This will determine the optimum value of resource-saving potential. It means that a scientific category of optimum resource saving

allows primary and secondary sources of commodities to be introduced into a socioeconomic system. Each of these components may be described as an individual line of investigation.

The outlined method specifies a more thorough analysis of reserves by components, for example, by secondary raw materials. Let us consider, in connection with this, secondary resources and solid waste from industrial production. This aspect is less often investigated in evaluating resource-saving potential. The term "secondary material resources" usually refers to a complex of various materials, which no longer serve their original function because of wear. These materials, however, have a certain value and can be used repeatedly as raw and secondary materials.

It is difficult to overestimate the importance of secondary resources to the national economy. By the early 1990s, each third ton of steel and fourth ton of paper and cardboard were produced from waste, and each fifth ton of sulfuric acid was produced from the exhaust gases at plants producing nonferrous and ferrous metals, petrochemicals, and so on. Studies show that more than 10 times less labor, power, and other resources are required to extract 1 ton of nonferrous metals from secondary raw materials than to produce primary metals. Thus, the cost of power to extract 1 ton of aluminium from secondary raw materials is 30 times lower; for copper, 6 times; for zinc, 3.8 times; and for lead, 3.2 times. The prime cost of producing 1 ton of black copper and aluminium from secondary raw material is 4 times lower than that from an ore raw material; specific investments are reduced by an equal factor. In melting steel from secondary materials, labor productivity is 2.5 times higher and capital productivity is 5 times higher than in producing steel from iron ore. [5]

Secondary raw materials utilization contributes to a considerable growth in savings potential. For example, a ton of scrap used instead of cast iron saves 28 man-hours in labor costs, according to VNIIPIlom calculations. With an annual consumption rate of 100 million ton of scrap iron, about 1.2 million workers may be released for other employment. General costs for preparing and processing scrap metal for producing cast iron are 4-5 times lower as compared with ore, while in melting steel the costs are almost 10 times lower.

Utilization of secondary ferrous metals is extremely significant economically. On the average, using 1 ton of a prepared scrap metal enables us to save 1835 kilograms of ore, agglomerate and pellets, 45 kilograms of fluxes, 529 kilograms of coke, 88 cubic meters of natural gas, 9.1 kilowatt hours of electric energy, 20.4 cubic meters of water, and 2113 cubic meters of oxygen

and compressed air. At present, utilization of secondary material resources makes it possible to save 13.7 billion rubles' worth of primary raw materials, including 7.4 billion rubles' worth of scrap and ferrous metals waste.

Let us consider the structure of solid production waste in Kazakhstan (Table 1).

Table 1

Design parameters of availability and output of solid production waste in Kazakhstan (1990), million tons

Parameter	Including			
	Total	nonfer. metallurgy	ferrous metallurgy	coal industry
Volume of rock body output	746	275	259	212
Including:				
mineral resources	248	65	53	130
rock of outburden and tunnelling	498	210	206	82
Concentration tailings	79.4	55.2	19	5.2
Slags (metallurgical, ash slag)	-	1.5	5.7	-
Final product (ore)	-	-	5	130
Specific consumption of raw material per unit product	-	4.2	4.9	1.8

Table 1 shows that Kazakhstan wastes almost 1 billion tons of rock body annually. This waste is composed primarily (57.6%) of waste from nonferrous and ferrous metallurgy, 33.9% and 23.7%, respectively. In the coal industry, waste amounted to 1.8 billion tons or 12%, in power engineering (ash slag) it amounted to 1.2%, and in the phosphorus industry, waste is 2.3% of the total amount. If these existing volumes of waste formation remain unchanged, by the year 2000 the total amount of solid waste will double, because utilization is rather poor (4--8% of the annual output). This happens even though both theory and practice have demonstrated that 20-30% of raw material resources can be saved by using solid production waste. Waste utilization is a very profitable and

promising business. This must be reflected in the strategy and mechanisms of the resource-saving economic development.

Saving raw materials as a scientific category is also connected to the fact that mining and using these materials adversely affects the ecological situation. This problem is rarely acknowledged from the resource-saving standpoint. We have already witnessed a dangerous tendency to cause irreversible damage to the environment. The acceleration of scientific and technological progress, together with the fact that our actions have an increasing impact on our surroundings, adversely affect the environment. F. Engels noted: "Let us, however, be not too hopeful about our victories over nature. For each such victory, nature takes revenge. Though each of these victories has, in the first place, those consequences that we had expected, but in the second and third place, they have other, quite unforeseen consequences, which very often wipe out the significance of the first consequences." [6] For instance, about 100 billion tons of different rocks are extracted annually from the earth's interior, and 70-80% of them are converted into waste, polluting the environment. The volume of all forms of waste increases by 5% annually. According to the materials compiled by the International Corporation on Scientific Investigations and Technology, the predicted growth of the world environmental pollution can be characterized in the following way (Table 2).

Table 2

Volume and structure of annual residual products of world's production and consumption, billion tons [7]

Residual products	1970	2000
Main gaseous pollutants of the atmosphere	19.71	50.76
Solid substances, ejected into the atmosphere	0.24	0.72
Solid inorganic waste	5.0	15.0
Petroleum products	0.07	0.24
Organic agricultural and domestic waste	14.1	37.4

It is important to note here that resource-saving potential is also related to a rational use of natural resources and to environmental protection. In the interests of present and future generations, a series of integrated measures are necessary

to protect and properly use the landscape, water resources and flora and fauna, to conserve pure air and water, to provide for natural resources reproduction, and to improve the environment.

The state documents that discuss a radical changes in the area of nature protection recognize the urgency to find a solution to the problem of rational use of nature, as a precondition for successful economic and social development. Here, particular attention is paid to the ecological situation in the regions which have a high concentration of extractive and processing industries.

Let us appraise the ecological situation in Kazakhstan. With large-scale production in the republic, the volume of purified water discharged into natural reservoirs comes to 47%. Harmful substances trapped by purifying plants are used in the amount of 28.3%. However, in the early 1990s, state capital investments for nature protection and the rational use of natural resources approximated 300 million rubles, which is obviously insufficient.

It should be noted that ferrous and nonferrous metallurgical enterprises in Kazakhstan are working on refining technological processes and resource-saving in metal production, thereby improving the ecological situation. However, the problems are growing while new low-waste, waste-free, and ecological technologies are introduced slowly. Many countries, including Japan, former West Germany, and South Korea, have completely eliminated inefficient and ecologically harmful open-hearth steel-making processes and now emphasize oxygen and electric-arc steel-making. And yet the republics of the former Soviet Union make produce than 50% of steel in open hearth furnaces, when such enterprises should be closed and re-equipped. [8]

The reserves of ecological resource-saving in ferrous metallurgy should be investigated from conversions. First of all, measures for saving metals and resources during metal production should be determined. The existing production processes of melting create a significant quantity of irretrievable solid, gaseous, and liquid waste, as well as heat losses, with each type of conversion having different a level of output. For example, according to the data compiled by Gipromez and VNIPI, 4.7 tons of solid materials are spent for 1 ton of steelmaking, 0.406 ton (or 8.6%) of which become non-used waste, mainly in the form of dust from steel-making units and gases. According to Gipromez, in the future it will be possible to reduce waste and increase a waste-free factor from 0.91 to 0.98. It was also found that water losses at metallurgical plants on the whole amount to 4.5% of the total rate, more than half of which is from the power industry. Water losses for 1 ton of steelmaking account for 2.3% (up to

8.73 cubic meters) per day. Heat consumption for 1 ton of steelmaking amounts to 10 Gcal, 3.25 Gcal, or 32%, of which are lost. Heat losses are distributed as follows: 23% for agglomerate conversion, 19% for blast-furnace conversion, and 26% for rolling conversion and flue gas.

Economic and ecological calculations of the indicated losses of metal and gas and dust blowouts into the atmosphere at the Karaganda metallurgical works alone are estimated at millions of rubles. Thus, 3.2-4.5 kilograms of solids, 2.7 kilograms of sulphur dioxide, and 0.5-0.1 kilograms of manganese are contained in the dust, calculated for 1 ton of conversion pig iron. With blast-furnace gas, combinations of arsenic, phosphorus, antimony and lead, vapors of mercury and rare metals, hydrogen cyanide, and resinous substances are ejected into the atmosphere. During agglomeration due to sulphur burn-out from pyrite, up to 700 tons of sulphur dioxide per day is ejected into the atmosphere from one machine.

The problem is that a combined use of mineral resources, which is a principal factor in environment improvement, must be achieved. Technical and technological possibilities for a combined use of raw materials are considerable and continue to increase. They reduce industrial blowouts and waste utilization almost completely, and cut down on environmental pollution, i.e. create a waste-free production. Knowledge of a complete and combined use of mineral resources makes it possible to use those deposits, which were considered economically unviable for extracting one or two main components. Here, as a result of primary waste processing and extracting additional mineral resources, the secondary raw material stock of one or another metal (component) increases. Thus, a complete and efficient use of secondary raw material resources in the form of waste and conversion into a new use value is an important line of environment improvement.

These are all necessary pre-conditions for developing a combined use of raw material resources in mining-metallurgical production in Kazakhstan, and for obtaining minimum waste as well. Thus, despite the division of principal metals into five categories (copper, aluminium, lead-zinc, and rare metals and gold mining) they are closely related technologically. Ores and concentrates from one plant serve as raw materials for the others, i.e. interbranch production cooperation is widely developed. This provides an efficient extraction of nonferrous metals associated with ores and concentrates. For instance, lead-zinc concentrate obtained at copper concentrating mills is processed at lead-zinc plants, and, vice versa, copper concentrates from the lead-zinc sub-branch are

processed at copper smeltery.

At the present stage, the principle of final efficiency should be applied to the national economy in capital investments, aimed at resource-saving potential. The costs of introducing new technologies and utilizing harmful substances should also be taken into account. The consumers' approach to nature must not be considered. Closed technologies and enterprises which create no harmful blowouts and runoffs are the most efficient way to maintain the ecological balance. However, this type of nature protection and the resource-saving potential optimization has yet to be estimated. The economic literature and prior experience have not always given proper attention to the economic damage from pollution. Projects to design and modernize enterprises do not always consider whether harmful agents are ejected, if the utilization of harmful agents creates by-products, and what the costs of these are. Therefore, the following condition must be introduced: the state should collect a certain sum from the enterprises, without regard to the form of ownership of the means of production. This charge, which must be included in production costs or deducted from profits, will be for ejecting waste into the environment. Self-supporting promotion of the resource-saving potential formation will therefore be enhanced.

A rational use of natural resources and the reduction of the adverse consequences of air and water pollution are together the most important component part of the optimum savings of raw material resources. Hence, there is a need to construct modern gas-dust collectors, to eliminate sources of pollution, to introduce low-waste and waste-free technologies, to utilize harmful agents from exhaust gases, and to use ecologically clean fuel. Protecting nature as an integral part of people's lives and paying attention to the purity of air, water, soil, and flora and fauna signify that we care about people and their health and about creating better living conditions, and reflect both economical and social aspects of resource-saving policy.

CHAPTER II
RESOURCE-SAVING AND ENHANCING PRODUCTION EFFICIENCY

Resource-saving, expressed by the quantity and quality of its potential under the conditions of market relations formation, directly affects the efficiency of social production. This savings is identical to the development of productive forces. Because the resource-saving process is very complicated, its influence on the production efficiency must be measured by means of a whole series of indices. A global estimate requires the application of the gross social product and especially the national income, as expressed in the specific consumption of materials, energy and metal, capital intensiveness, capital productivity, and social labor productivity.

When constructing the model of how resource-saving influences production efficiency under market conditions, we give preference to the national income for the following reasons. Resource-saving as a factor of efficient economic management is, in the final analysis, designed to satisfy our material and cultural requirements. The only source for fulfilling these requirements is national income. Consumption and accumulated capital, which determine the material basis for developing the national economy and raising the standard of living, depend on the size of the national income. A net product expresses the absolute value of the result, for which the production is carried out and the raw material resources are saved.

Resource-saving as an economic consequence of social production is best characterized by the national income increment. The latter is largely devoid of the elements of repeated account and is the best reflection of the efficiency of

production operation from resource-saving. The national income provides a generalized form of the results of production activity, including resource-saving. Consequently, determining a resource-saving influence on the production efficiency of a country or region must be based on national income and its indices.

Naturally, we must bear in mind that a part of the national income increment is not only the result of savings, but comes from organizational improvement, production promotion, and other factors. For instance, approximate calculations show that up to 20% of the annual economic effects in Kazakhstan are the result of organizational measures. Therefore, we should focus on that part of the national income increment that does not distort the other factors. For this end, we can apply a comparison method, which assumes the influence of other factors to be constant. The result of any possible combination can be found, if each of the factors in succession is considered as variable and others as constant. This method is gaining ever-increasing acceptance in scientific investigations. [9] It makes it possible to reach a generalization about the influence of material resource-saving on the dynamics of social production development (Table 3).

Table 3

Resource-saving influence on production efficiency of Kazakhstan

Index	1975	1980	1985	1990
Produced national income, billion rubles	15.1	20.6	25.4	28.4
Material costs (including depreciation) billion rubles	16.6	22.7	32.5	42.3
Material input per unit of national income, kopek/rubles	90.9	90.7	78.2	67.1
Social labor productivity, %	100	112.7	112.7	119.2

This table requires explanation. Social labor productivity characterizes the dynamics of production efficiency. The merits of such an approach are not in question. The following arguments provide strong evidence for this: "Labor productivity in general is a maximum of product with a minimum of labor," i.e.

with the greatest labor-saving, and, "The actual economy - saving - consists of saving working hours (minimum - and reduction to minimum - of production costs)..." [10] However, the economic content of labor productivity is estimated differently by scientists. Some think that it expresses the economy of the total aggregate labor and is a generalized index of efficiency. Others believe that it is an index of only the labor force. [11] We consider labor productivity to be a category expressing the law of the labor force. The essence of labor productivity growth is revealed in the economy of necessary working hours. In dynamics, the productivity figure also reflects, to a certain extent, a use of previous labor. However, this characteristic does not replace a global index of production efficiency, but is its particular expression in estimating the results of resource-saving.

Applying the productivity figure to a characteristic of resource-saving (see Table 3) illustrates that the Kazakhstan national economy is characterized by a slow reduction of material input per unit of social production with a minor rate of increment for the produced national income. During the period of 1975 to 1990, specific material input per unit of national income was reduced by 1.3 times, while labor productivity increased by only 1.2 times. With this ratio, the effect must be more significant.

National income can also be used in constructing a model of capital productivity. It can be presented as the result of the resource-saving influence on the production efficiency in the form of the following formalized expression:

$$Er = \frac{\sum_{t=1}^{T} NI}{\sum_{t=1}^{T} C} \rightarrow \max, \qquad (2)$$

where Er is the efficiency of capital investments in the resource-saving; NI is the national income increment, due to resource-saving; C is the capital investment in raw materials resource-saving; and T is time.

Another index describing the resource-saving influence on production efficiency is a rational use of the basic production assets (BPA). Here we have large reserves. At present, a share of an active part of basic assets (machines and

equipment) amounts to only 27.9% in ferrous and nonferrous metallurgy. On the whole, basic assets have taken a lot of wear and tear, and continue to do so. Thus, at metallurgical self-supporting enterprises, wear of basic production assets was: 25.4% in 1970, 39.7% in 1980, and more than 50% in 1990. Technical modernization is proceeding slowly. In 1990 at the regional metallurgical complex, outdated basic production assets have been discarded in the amount of 1.9% of their total cost. The condition of the material and technical base of ferrous and nonferrous metallurgy prevents us from enacting an adequate policy of economy. During the period of 1980 to 1990, annual losses due to spoilage in these branches comprised a significant share of gross production cost.

It is important to use a model of capital productivity for estimating the resource-saving influence on production efficiency as a result of the following considerations. A tendency of priority growth of a net product, as compared to accumulation upon using new resource-saving equipment, must prevail, since the efficiency of scientific achievements must increase. This tendency is especially important as regards the scientific and technical revolution. Positive changes in the ratio of national income to basic assets indicates the growth in production efficiency and an increase in the influence of resource-saving on reproduction processes.

If the use of operational equipment (increased capital productivity) remains at the level of the preceding period, then the national income growth rate (all other factors being equal) will not change. Conversely, with resource-saving, the tendency to a net product growth will become dominant. Under this precondition, the relationship between accumulation of the resource-saving equipment F and the growth rate of a net product can be presented as:

$$NI > F$$

The given indices of resource-saving efficiency should be supplemented by the indices that enable us to estimate efficiency at all stages of realization. We need an index to describe the relationship between the profit, obtained at a given moment as a result of savings, and the cost of the corresponding works being performed. This index, Ri, can be seen as a ratio of the profit increment mass (Pi) of the ith moment, due to work on material resource-saving, to the volume of capital investments for the aims realized to this time (Ci):

$$Ri = \frac{Pi}{Ki} \qquad (3)$$

A system of resource-saving indices describing the economy at different levels gives a more complete picture of the characteristics of this process. For instance, in the former Soviet Union, outlays for raw materials, materials, and fuel were more than 58% of the gross social product structure. For Kazakhstan this meant an annual economy of about 0.4 billion rubles. Here and below the author's statistical data and materials are in current and comparable prices for January 1, 1991.

Resource-saving has had a positive effect on the growth of the national income in the republic. Its annual increment (in comparable prices) accounted for 3% in 1986-1990. The influence of resource-saving on production efficiency in Kazakhstan yields the following data. On average, every year the enterprises (with the exception of agriculture) save about 100,000 tons of rolled ferrous metals, 400,000 tons of cement, 225,000 cubic meters of timber, 812 million kilowatt hours of electric energy, etc. In this case, the volume of electricity saved doubles annually.

The influence of resource-saving on production efficiency must be carefully controlled. We need to have a procedure to find reserves of material resources-saving, which must reflect the use values of the resources that correspond to the most complete realization of the mechanism of efficient economic management. Therefore, it is necessary move to a complex system analysis of the economy, which will enable us to make decisions that can be justified. In practice, such an analysis will involve, first of all, investigation of a model with corresponding economic information, including the formation of resource-saving factors and indices. A model of an enlarged mining-metallurgical production is given below.

A model analyzing the main groups of resource-saving economic indices in mining-metallurgical production in Kazakhstan:

Block I. Economical use of mineral raw materials:

(1) Comprehensive development of the earth's interior (increasing ore extraction from the interior; use of current waste from the mining industry);

(2) Rational use of past years' waste;

(3) Complex use of the extracted raw materials (increasing complete extraction of valuable components and complex utilization of raw materials);

(4) Optimization of the production structure and product consumption.

Block II. Environment protection:

(1) Reduction of dust-gas ejections;

(2) Sewage treatment and circulating water supply;

(3) Measures to repair the environment.

Block III. Justification of complex resource-saving measures (in Kazakhstan's conditions):

(1) Wide-scale introduction of resource-saving technology with a reduction of raw material losses, complex processing of raw materials and waste at each conversion, and utilization of production ejections and drainage that have been purified;

(2) Protection of the interior of the earth and the environment, involving the intensive processing of solid production waste and the extraction of valuable and useful components;

(3) Introduction of material incentives for resource-saving by paying premiums for saving a particular type of raw materials (from 50 to 90% of the saved sum); mastering normative methods of account of production costs, as well as wide introduction of complete cost accounting.

The model covers a wide range of problems of developing industrial branches that are engaged in prospecting, mining, enrichment, and metallurgical processing of mineral resources. Mineral resources extracted from the interior of the earth are the resources that cannot be recreated by nature itself. Under these conditions, the resource-saving strategy is the only proper way to develop the indicated branches. This strategy must begin with protecting the interior of the earth and a rational use of mineral and raw material resources, and end with the production of final products.

To classify the resource-saving reserves, we employed the most important directions for the rational use of natural resources. In order to apply the classification in practice, the resource-saving reserves should be expanded into more detailed practical recommendations for savings. This is extremely important, in light of the fact that annual waste output in the nature-exploiting branches amounts to 1 billion tons. In the processing industries, the figures are: light industry - 79,000 tons; food industry - 1,830,000 tons; wood-working industry - more than 1,000,000 cubic meters; and agriculture - 23,000,000 tons.

The above calculations can be supplemented with data from heavy industry waste, estimated at a total of about 11 billion tons. Thus, the ferrous and nonferrous metallurgy, chemical and coal industries have dumped more than 9 billion tons of overburden rocks, 1.5 billion tons of concentration tailings, and more than 100 million tons of slags. Waste piles from power plants have 200

million tons of ash and slags. Currently there are 690 tons of waste for every citizen of the region.

Industrial waste should be considered an important resource potential for savings strategy. According to approximate calculations, with a complex use of raw materials, the industry of the country could produce 25-30% more products at existing mining plants. Depositing industrial waste in built-up areas does not require funds for geological exploration and transportation. With an allowance for the expense of establishing dumps, storage, soil recultivation, and other measures for environmental protection, the additional products would cost the national economy 2-4 times less than specially extracted raw materials.

The national demand for ferrous, nonferrous, rare, and noble metals may be largely met by scrap and metallurgical waste. Secondary nonferrous metals constitute 20% of the national economic balance. Using these metals makes it possible to reduce the demand for raw materials and energy, and saves labor. On an annual basis, producing aluminium alloys from scrap will save more than 1 million tons of bauxites, 300 thousand tons of equivalent fuel, and 12.5 billion kilowatt hours of electric energy, and will release 9.8 thousand people for other jobs. In nonferrous metallurgy, 33 times less fuel and 6 times less specific capital investments are required to produce 1 ton of aluminium from secondary raw materials. In this case, productivity is more than twice higher and the cost of conversion is 7 times lower.

Mining and processing are dominant enterprises in Kazakhstan. We therefore ascribe a great deal of importance to an intensive and complex processing of extracted raw materials, reduction of losses, and wide-scale use of by-products and waste. At present, a number of enterprises of the region treat the problems of complex use of mineral resources inadequately. As a result of this, a large quantity of precious, scarce nonferrous metals and a number of other elements are lost.

The rate of growth of processing secondary raw materials is lower than the rate of their formation. From the annual output, only 4.9% of overburden rocks, 4% of ash slag waste, 46% of asbestos waste, 9% of slags from ferroalloy production, and 13% of slags from alumina production are involved in the national economy. For every ton of secondary raw materials being used, Kazakhstan produces 13 rubles' worth of industrial products and consumer goods valued at 0.9 rubles. At Ukrainian enterprises, the figures are 30 and 3 rubles, respectively. A comparison of specific volumes shows that Kazakhstan lags considerably behind other nations in processing secondary material

resources. To a considerable extent, this is due to a lack of capacities. Only one plant for dry ash screening with a capacity of 100 thousand tons operates in the region, while an annual output of ash-slag waste is 18 million tons.

More than 5 million tons of ferrous metallurgical slags are being formed in Kazakhstan annually, including 3.2 million tons of blast furnace slags, 1.2 million tons of steelmaking slags, and more than 0.7 million tons of ferroalloy slags. However, only about 57% of slags are utilized, according to our rough estimates. Blast-furnace slags are the most efficient (by 90%). From this, 2 million tons of granulated slag and 800 thousand cubic meters of crushed rock are produced, including 300 thousand cubic meters of fractionated crushed rock. Steelmaking slag, after large lumps of scrap have been extracted, is dumped. As a result, more than 17 million tons of blast-furnace slags have accumulated in dumps. Therefore, Kazakhstan's ferrous metallurgy industry has great potential to save ferrous metals and raw materials during metal production, as well as during processing of their raw material waste. Thus, an output coefficient for steel from rolled metal production is still high. In the countries of the former Soviet Union it averages 1.41, as compared to 1.16 in the United States, 1.17 in former West Germany, and 1 in Japan. The figures for electrical steelmaking are very low even though electronic, electron-beam, and plasma arc melting were developed in the domestic metallurgy industry. There is has been a considerable lag in introducing the continuous casting of steel. Only 14% of steel is produced by this method, as compared to 92.7% in Japan, 84.6% in former West Germany, 71.1 % in South Korea, and 53.4% in the United States.

What is the significance of the secondary use of materials (mainly scrap and secondary power and heat resources) to the efficiency of the national economy? Kazakhstan possesses 10% of the secondary scrap resources of the former Soviet Union, 3.5-4 million tons of which are involved in the annual economic turnover. In the future, stocking and processing of scrap can grow to 6 million tons per year. However, the structure and formation of scrap differ greatly from utilization. For instance, 45% of scrap is obtained from the depreciation of the basic production assets, repairing them, wear and tear, and written-off equipment; 40% is from metal waste obtained during the production of metal; and 15% is metal from metal working in machine-building.

Here it should be noted that only 62% of ferrous metal scrap and 54% of nonferrous metal scrap are utilized in machine-building. The output coefficient for ferrous rolled metals in this branch varies within 0.78-0.79. Increasing this coefficient even by 0.01% will save 19-20 thousand tons of metal. Hence, in

Kazakhstan up to 300-400 thousand tons of scrap are not involved in the annual economic turnover.

A scrap utilization level in the national economy is estimated by its share during production of cast iron and steel. The share accounts for 49% of cast iron and 44% (on average) of steel, including 47% of blast-furnace steel, 27% of open-hearth steel, and 49% of electric steel. A high economic efficiency of scrap utilization is explained by the fact that the cost price of 1 ton of conversion pig iron averages at least 55 rubles, while specific investments on 1 ton of cast iron total 200 rubles. The respective indices for scrap are 5.20 and 28.97 rubles. In addition, when 1000 tons of steel are produced from scrap, ejections to the atmosphere are reduced 6.5 times, water is polluted 4 times less, and 16 times less waste (slags) is formed. It follows that there are large reserves of resource-saving and secondary resource-saving in the region, from melting metal in conversions, as well as from utilization and trapping waste and ejections.

A reduction of ore losses has a considerable effect on the national economy of Kazakhstan. In ferrous and nonferrous metallurgy, mining is the most labor-consuming and capital-intensive branch (more than 70%). This sector of the economy comprises 9.1% of the specific weight of rock mass extraction in the former Soviet Union, including 8.13% of iron ore, 93% of chromite ore, and 2.5% of manganese ore. In 1987, the physical volume of the mass-mined rock was over 450 million tons, and the volume of mineral resources was 53 million tons, i.e. for each ruble of output, 32 kilograms of rock and 3.78 kilograms of ore were extracted. From the indicated volume of the ore raw material, slightly more than 9 million tons are processed, and up to 5.5 million tons of cast iron are melted (80% is exported). Here the waste from the mining industry remains in dumps in the form of dressing tailings and overburden rock, adding up to 19 and 390 million tons respectively.

The problem of the combined use of ore raw material in ferrous metallurgy is significant. Kazakhstan's share in the former Soviet Union comprises about 10% of the balance stock of iron ores, more than 97% of chromite ores, and up to 13% of manganese ores. The physicochemical and material valuable composition of all the indicated ores are multicomponent and complex. The most valuable and easily dressable iron ores are magnetite ores, with a specific weight equal to 33.4% of the total stock, concentrated in 18 deposits in the republic. Except for iron, they consist of sulphur, cobalt, nickel, vanadium, titanium, copper, zinc, lead, selenium, tellurium, gold, silver, etc., up to 25 elements in total. Hematite magnetite ores concentrated in three deposits account for 2.6% o

the total stock. They contain large amounts of sulphur and manganese, and less titanium, nickel, cobalt, copper, vanadium, germanium, etc. No less complex are brown iron ores and oolitic ores comprising 64% of the total stock of iron ores, which are located in large deposits. These ores have a high content of phosphorus, alumina, and vanadium, which accumulate in production waste in large quantities.

The development of deposits of the indicated ores is far from perfect. Thus, all three iron ores are mined in only 7 of 24 deposits, and amount to 55 million tons a year. Moreover, only monometal, namely, iron, is extracted from the ores (78% from magnetite ores, 73% from hematite ores, and 74.9% from brown iron ores). Other metals and rare elements, together with dressing tailings, with an iron content from 16 to 28%, are taken to dumps.

Many problems arise in the combined use of ferrous metallic ores. What is the significance of resource-saving for one example, Lisakovsk brown iron ores? The flow charts for the combined use of brown iron ores have been inspected at operating metallurgical plants, such as Azovstal, the Alapaevsk metallurgical plant, the Pikalevsk alumina plant, the Uralsk aluminium plant, and the Karaganda integrated iron and steel works. However, the desired result has not been achieved. It was proved that the optimum, continuous, and consequent complex chart for Lisakovsk ore processing is as follows: magnetic roasting chart for ore dressing, obtaining concentrates with ore content 62%; agglomeration of concentrates in the mixture with magnetic roasting and other concentrates (in a ratio no less than 80:20); blast-furnace melting of agglomerate, obtaining alumina slags for application in the cement industry; converter conversion of phosphorous cast iron with a phosphor content of not more than 0.7%; and combined processing of steelmaking phosphorous slags, obtaining phosphate slag, suitable for fertilization of acid soils. In this case, residual metal is first extracted from steelmaking slags.

Although the whole chart is not developed in production quantities (except for the Karaganda integrated iron and steel works), practical development of individual parts of this complicated flow chart is different. This gives us no way to determine a real value for the economic effect resulting from the combined use of these ores. The possibility of extracting another valuable metal, vanadium, from brown iron ores has hardly been studied. The Institute of Metallurgy and Dressing of the Kazakhstan Academy of Sciences has proved the technological possibility of extracting vanadium. The procedure for extracting vanadium from low-grade vanadium containing slags, obtained during combined processing of

Lisakovsk ores, requires an experimental and industrial inspection. Technical and economic substantiation should be compiled on the basis of these results. According to preliminary data, the balance stock of the whole Lisakovsk deposit can yield vanadium in the amount of about 2 billion rubles.

Under the indicated preconditions, the resource-saving strategy must reflect a qualitative and quantitative estimate of the significance of solid waste savings for the national economy of the region. The analysis has shown that in nonferrous metallurgy a yield of solid waste per one ruble of commercial output was 582.6 kilogram/ruble; per worker, it was 49.3 thousand/person; per unit of basic production assets, it was 1090 kilogram/ruble. The data for ferrous metallurgy were 164.6 kilogram/ruble, 54.2 thousand/person, and 1204 kilogram/rubles, respectively. Undoubtedly, the given design parameters for solid waste yield affect the performance of these branches. They thereby reduce capital and labor productivity due to the rise in labor intensity in the mining industry and higher production costs.

More than a quarter of ferrous metallurgy waste of all the countries of the former Soviet Union is concentrated in Kazakhstan, including: 3.95 billion tons (22.8%) of rocks from overburden and tunnelling works, 1390 billion tons (42.1%) of dressing tailings, 56 million tons (15.6%) of metallurgical slags, and 34.47 million tons (19.2%) of slimes from alumina production. However, no more than 3.8% of the annual waste yield is used in nonferrous metallurgy, i.e. more than 96.2% is dumped annually, adding 1.6 billion tons of waste each year. In Kazakhstan, the amount of solid waste in dumps is somewhat lower in ferrous metallurgy than in nonferrous metallurgy, accounting for 3.8 billion tons with the annual yield being 230 million tons and utilization being 9.5%.

It is important to determine the scope of solid waste utilization in order to realize the resource-saving policy, and thereby to enhance production efficiency. For example, in spite of the greatest volume of overburden rocks in the total amount of waste, their use in ferrous and nonferrous metallurgy does not exceed 5% of annual output (11.3 million tons). At all operating ore-mining nonferrous metallurgy plants in Kazakhstan, rock dumps of different sizes are usually located in industrial territories, and accumulate over many years. Unfortunately, this situation will not change in the immediate future, because solid waste amounts to 72.5%, and annual growth is equals 11.7% a year.

An essential drawback in saving secondary resources is poor utilization/ consumption of production waste by the enterprises. Thus, according to Kazakhstan's plan for economic and social development for 1989, out of 52

types of secondary raw materials, only a few have been used. In the coming period, to ensure the maximum utilization of secondary raw materials, we must call for a priority development (introduction) of the capacities for processing secondary raw materials, instead of primary raw materials. On average, the capital investments in these entities will be returned in about two and a half years.

Specific plans have been singled out as being most efficient. State capital investments and bank credits must be used to finance the capital investments for these ventures. Bank credits must be properly guaranteed by contract and design-prospecting works, under state orders. When determining the need for material resources, the plants must first assume the necessity to maximize both their own secondary raw materials and those coming from other sources. Primary raw materials should be used only if secondary materials prove to be insufficient or the requirements for the quality of finished products have increased. A new economic approach is required here. When progressive technologies and products are being developed (including the products planned for production at new, as well as operating, enterprises), technical solutions for utilizing the waste must be provided using estimates, design documentation, and technological know-how.

Analyzing the resource-saving process, we have concluded that special emphasis should be devoted to research and development, as well as to design work on the problems of secondary raw material use. This applies to schools, colleges, and academic institutes where fundamental investigations should be carried out. The finished developments must be introduced here initially.

Some of the resource-saving measures proposed above, especially those for secondary raw materials savings, are described in a collaborative work entitled, *"Republican Combined Program on Involving Secondary Material Resources of Kazakhstan into the Economic Turnover by the Year 2000,"* which was prepared with the help of the author. For example, the author contributed the section on the economic effects of secondary raw materials resource-saving in the region (Table 4).

Table 4

Economic effects of secondary raw materials resource-saving strategy in Kazakhstan

Index	1985	1990	1995	2000
Amount of output produced with secondary raw materials, million rubles	671	980	1030	1721
Level of secondary resources formation per year, million tons	575	672	709	635
Volume of their involvement in turnover, million tons	62.7	86.9	107	124
Utilization level, %	10.9	12.9	14.8	19.5
Level of capital investments, million rubles (for 5 years)	-	332	418	582.4
Average annual economic effect, million rubles	119.5	232	360	375

The given program was compiled for the most important types of production and consumption waste, such as metallurgical slags and dressing tailings from the ferrous, nonferrous, and chemical industries. It also discusses wastes from coal mining and coal dressing, wood waste, and more than 20 types waste from agriculture and the food industry. On the whole, the program was developed for 42 types of waste from 10 branches of industry. It is the first stage in systematic work on the utilization of secondary raw materials in Kazakhstan.

The combined program establishes that from 1986 to 2000, up to 1.4 billion tons of different secondary material resources will be processed and 17 billion rubles' worth of additional products will be produced. According to these calculations, each ruble of capital investments must return an output of more than 13 rubles (products from a primary raw material are equal to 5 rubles). The results of this work are reflected in the program for the economic and social development of Kazakhstan until the end of the twentieth century. On the whole, the guide lines are unrealistic. They are above the figures for 1986-1990, when the volumes of secondary resources utilization multiplied by 1.6 times and accounted for 87 million tons after five years, with the output in the amount of 1

billion rubles. Thanks to this, up to 20% of primary raw materials have been saved. The level of secondary raw material use has increased to 12.6%. It was calculated that in order to attain this goal, about 300 million rubles of capital investments will be required in these five years alone, and more than 40 processing projects must be brought into operation.

Thus, resource-saving becomes an ever more significant factor in production efficiency, qualitative economical development, creating a proper ecological situation, working for nature protection, and maintaining conditions for the essential activities of future generations.

CHAPTER III
IMPROVING THE ECONOMIC STRUCTURE OF KAZAKHSTAN

The resource-saving economy is closely related to the optimization of its structure and the dynamic development of the most progressive branches, those that determine the production efficiency and the standard of living. In general, some of the interrelated problems of the national economy have been aggravated. These problems are the result of certain ramifications of the past years and difficulties in implementing economic reforms. The current transition period is complicated by destabilizing factors and the gradual substitution of economic methods for administrative methods. The enterprises had been tightly interconnected under the totalitarian system, and when the economic ties between them were broken, and the supply system disintegrated, production declined. Now the enterprises must themselves conduct an independent search for suppliers and customers.

Despite these difficulties, positive changes have taken place in the republic. This is evident from the results of the last five years. During the period of 1986 to 1990, about 56 billion rubles of basic assets were introduced. The average annual rates of developing capital investment and implementing SMR have outperformed the indices of the previous five years. The material production branches now estimate economic activity by their end results. This has improved their financial situation. An average annual profit increment in the republic was 21% in the last five years as compared to 1% in the preceding five years.

Social reorientation of the economy has increased. A share of the consumption fund in used national income has increased from 68% in 1985 to

71% in 1990. A share of the accumulation fund has decreased as a result of the introduction of a new economical mechanism, which provided an increment reduction of material circulating assets. The volume of consumer goods output (excluding spirits) increased by almost 60%, including 50% of non-food items. This made it possible to increase the supply of goods in the republic, at the expense of production, to 65% in 1990 as compared to 40% in 1985. The volume of retail turnover and cooperative trade (including public catering) has increased by 27% in five years.

Capital investments are being directed primarily to fill social needs. During the period of 1986 to 1990, 15.3 billion rubles were allocated to social development, two times more than in the preceding five years. Considerable funds were invested in building houses, schools, kindergartens, hospitals, etc., as well as in improving production of consumer goods. In this period, capital investment to light industry exceeded the five-year plan calculations by 1.9 times.

At the same time, the realized development of the material production branches has not led to adequate growth of the produced national income. In addition, the republican budget formation was complicated because of the high level of material input per unit of social production and the imperfect nature of the economic mechanism. In the last five years, the foreign trade turnover has been reduced as well, which decreased the national income by 1.5 basic points. As a result of these factors, combined with a high level of specific consumption of materials, the produced national income fell short by 6 billion rubles, compared to the calculations, an average of 1.5 billion rubles per annum.

Estimating the operation of the national economic branches by the end results has created a positive change in the produced national income structure. The industrial share has fallen from 31.6 in 1985 to 20.9% in 1990, the agricultural share has increased from 28.4 to 41.6%, and the construction share has increased from 15.6 to 15.9%.

Structural transformations took place, first of all, in the basic industrial branches. In 1990, an index of the total volume of industrial production accounted for 116%, as compared to 1985. Gas, petroleum refining, chemical, and petrochemical industries developed by priority rates. The specific weight of chemical and petrochemical industries increased from 5.6 to 6.3% and the specific weight of machine-building from 16.8 to 17.6%.

At the same time, the industrial production structure has not changed significantly, since funds must be restructured in order to accelerate development

in the social sphere (Table 5).

As the data given in Table 5 illustrates, the specific weight of the mining industry has not been reduced in the total volume of industrial production. In 1990, it amounted to 14.8% (as compared to 15% in 1985), and the share of the manufacturing industry amounted to 85.2% (as compared to 85%). The share of the food industry remained at the 1985 level (14.8%), while the share of light industry decreased from 15.8 to 14.8%.

Table 5

Dynamics of the industrial production structure, %

Industrial branch	1985	1990	
	five-year plan		actual figures
The entire industry	100	100	100
Including:			
mining	15.0	14.9	14.8
manufacturing	85.0	85.1	85.2
From the total volume of production:			
power engineering	5.5	5.4	5.3
petroleum production	1.9	2.1	1.8
petroleum refining	1.8	2.1	2.1
gas	0.3	0.3	0.2
coal	7.0	6.4	6.1
ferrous metallurgy	5.7	5.8	6.1
nonferrous metallurgy	11.1	10.0	9.5
chemical/petrochemical	5.6	6.0	6.3
machine-building	16.9	18.2	15.9
lumber, wood working, and pulp-and-paper	2.7	2.6	2.7
building materials	5.9	5.6	5.6
light	15.8	15.5	15.6
food	14.9	15.0	15.8
microbiology	0.4	0.3	0.4
milling-groats and balanced fodder	3.8	3.7	4.9

In the period of 1986 to 1990 the fuel-power enterprises did not keep pace with the plan. In 1990, the republic consumed 15 billion kilowatt hours more electric power than it produced.The increment rates of electric power consumption and production amounted to 16 and 12.5%, respectively. Since electric power production lags behind consumption, the republic has to get ever-increasing amounts of electricity from other republics. An average tariff for the electric power obtained from other republics was higher than the cost of production in the republic. Therefore, direct costs for purchasing electric power accounted for 105 million rubles in 1990. When the Ekibastuz hydroelectric power station-2 did not begin to generate power on schedule, the republic had no uninterrupted, self-sufficient source of reliable electric power. Limited centralized capital investment, insufficient power production capacity in Kazakhstan, and problems of environmental protection prevented the construction of the South Kazakhstan hydroelectric power station, which would serve the towns of Pavlodar, Karaganda, Akmola, Semipalatinsk, Ust' Kamenogorsk, and others. About 40% of shepherd's stations for stock breeding still do not have a stable power supply.

The coal industry enterprises, though exceeding the five-year plan targets, did not operate at a steady rate, and coal mining fell by 5 million tons as compared to the previous year. This was partially caused by a reduction in demand for high-ash Ekibastuz coal and workers' strikes in the Karaganda coal basin. The fact that mines have a low technical standard remains a serious problem. Almost half of the 26 mines in the Karaganda coal basin have not been upgraded since 1960. Mining works have become deeper, resulting in increased pressure, a higher volume of gas, and a greater chance of blowouts. Hence, labor intensity has also increased considerably. In addition, the problems of coal mining in built-up areas have been solved very slowly.

In 1990, oil production was reduced by 0.3 million tons. In the five-year period, production fell short of the targets established by the plan by 2.4 million tons of oil and 0.5 billion cubic meters of gas. The reason for this shortfall was that production line No.1 was not put into operation at the Tengiz deposit, because the technological equipment was not supplied in time. In addition, the Kumkol' oil deposit did not reach its goals and the Orenburg gas works (where there were delays in the expansion project) refused to receive gas from the Karachanag deposit. As before, a vast amount of by-product gas was burned. In the last five years, about 2.5 billion cubic meters of gas were burned, equal to the loss of commercial products worth 24 million rubles. In 1990, 63.2% of by-

product gas was utilized, while an average of 78.3% was utilized in the former Soviet Union.

Oil refining in the republic has increased by more than one third, thanks to increased the capacity at the Chimkent oil refinery. The depth of oil refining has increased appreciably, and was 66.8% in 1990. Appropriate measures have increased gasoline and diesel fuel production by 1.5 times. As a result, the republic can now fill 90% of its domestic gasoline needs and 60% of its diesel fuel needs. Growth and diversity in the production of petroleum derivatives , including clear gasoline and winter diesel fuel, are an anticipated result of new installations for catalytic cracking, carbamide dewaxing, etc. Insufficient capital, delays in delivery, and inferior construction companies thwarted these facilities from opening in the previous five years.

The realized production level in nonferrous metallurgy has been maintained. The five-year plan indices have been met for the production of alumina, refined copper, titanium sponge, magnesium and its alloys. At the same time, because of a low metal content in ores, production from local raw materials at the branch enterprises continues to fall. New programs are being introduced very slowly. Over the past five years, about 140 million rubles of assigned capital investments were not utilized in nonferrous metallurgy building enterprises. As a result, the disparity between raw materials and metallurgical enterprises has increased. Only 82-88% of the metallurgical works capacity to produce copper, lead, and zinc are used.

Ferrous metallurgy production has grown considerably in the last five years. A share of advanced and economical types of rolled metal has reached 40% of the total. Production of cold rolled sheets increased by one-third, and production of rolling using strengthening heat treatment and low-alloy steel rolling increased by 25%. New facilities increased iron and chromium ores production. Nonetheless, the technical level of production remains low. At the Karaganda integrated iron and steel works, more than half the coke-oven batteries have been in operation for 30 years, while the norm is 20 years. At the Sokolov-Sarbaisk works, more than 70% of the equipment has been in service for over 10 years. Due to design and construction drawbacks coupled with poor production organization, the design capacity of the tin-plate shop, introduced in 1983, is only 80% developed. Technical re-equipment and modernization of equipment proceed very slowly because of lack of funds and a backwards construction industry production base.

From 1986 to 1990, the production output of machine-building plants

increased by 27.5%, and more than 300 new types of machines, equipment, and devices have been developed, half produced for the first time in the country. They include a new, technologically perfect tractor, hydraulic excavators with telescopic equipment, improved metal-cutting machine tools, devices to produce parts from metal powders, processing centers with CNC, sprocket-rolling mills, and a number of other machines and equipment, created with the help of the latest scientific and technological advances. Nonetheless, the growth rate of machine-building output lags far behind demand.

The trend in machine-building development does not correspond to the demand of the national economy. If in 1990 the country-wide average of a share of the machine-building complex was 29.6% of total production, in the republic it was 15.9%. [Statistical Almanac of the National Economy of the USSR for 1990, (Moscow: Financy i statistika, 1991), p. 356.] That is why the Kazakhstan's demand for many types of products was largely satisfied by imports. This includes machine-building products, instruments, radios, electronics, automobiles, production equipment used in the manufacturing branches of the agribusiness complex, catering supplies, and complex domestic appliances. At the same time, more tractors were exported from the republic than were imported.

Owing to the fact that the majority of machine-building enterprises were governed by the all-Union ministries, it was not possible to implement a carefully designed structural policy and to control the investment process. Thus, the share of capital investments allocated to machine-building and metal working increased during the last three five-year plans by only 1.2 basic points and amounted to about 10%.

The inadequate state of basic production assets has a negative effect on the economic indices of the branch. Half of the equipment in the republic as a whole has been in service for more than 10 years; this is true for 60% of tractors, agricultural machinery, and equipment used in basic engineering. Maintenance of this equipment affects the growth rate of productivity, the utilization level of production capacities, output quality, and resource-saving. In the last five years, production capacities utilization in the machine-building industry fell from 85 to 82%; in instrument making, from 95 to 90%; and in the tractor and agricultural machinery industry, from 87 to 79%. The share of state-of-the-art machinery and equipment, employing automatic manipulators, industrial robots, automatic lines in press forging, etc., is very low. Many plants did not meet the planned programs for technical re-equipment and updating basic assets in machine-

building.

The bottleneck of machine-building production is still equipment flexibility, and idle periods during a day or shift . Flexibility in metal-working equipment does not exceed 1.31, including 1.25 for metal-cutting machine tools and 1.28 for press-forging machines. About 20% of equipment downtime is caused by equipment breakdowns and unscheduled maintenance. These factors and others have caused a negative dynamics of capital productivity, one of the most important indices of operation efficiency. For the last five years, this index declined from 122 to 110 kopeks.

In the past five years, production volume has increased by 43% at the republican chemical industry enterprises. Production of mineral fertilizers, yellow phosphorus, sulfuric acid, polystyrene, polypropylene, caustic soda, synthetic detergents, and a number of other types of products has increased.

At the same time, the chemical industry enterprises (except for the Aktyubinsk chromium compounds plant and the Kustanai industrial company, Khimvolokno) have been working at an unsteady pace and did not meet the planned output for the most important products. Work at the Chimkentshina and Karagandarezinotekhnika companies was poor. Because of difficulties in maintaining equipment, under-qualified maintenance personnel, and interruptions in the supply of heat and vapors, the utilization level at Chimkentshina was only 54% in 1990. A full range of

rubber engineering components was not produced at Karagandarezinotekhnika because separate production shops were understaffed, there were shortages of heat, and problems arose with labor and technology.

The technical state of many industrial companies with long-term operations is woefully inadequate. Improper distribution of capital, materials and technical resources has impaired technical production development. As a result, the efficiency of the production potential has been reduced. In addition, fulfillment of planned targets was consistently complicated by irregular deliveries and shortages of basic types of raw materials (polyvinylchloride resin, ethane, benzene, polyethylene, completing materials, etc.).

The timber and woodworking industries have not reached the targets set out by the five-year plan for production of wood particle, fiber boards, wood, paper, and furniture. Much of the operating equipment at wood and furniture factories is out of date, but the ministries did not provide them with the equipment necessary for updating production.

The fact that the republic produces few finished products in their entirety is

a source of great anxiety. There are substantial discrepancies between imports and exports, as illustrated by the data in Table 6.

Table 6

Export and import structure (according to the average annual interbranch balance for 1986-1990), %

Type of product	Export	Import
Electric power	2.2	1.9
Fuel	6.6	6.3
Raw materials, accessory materials, semi-products	74.2	43.8
Finished products	17.0	48.0

If the republic has sizable fuel resources (for example, in 1990 coal imports amounted to 84 million tons, and coal exports equalled 125 million tons), the finished products situation is not improving. This is particularly true in machine-building exports. Exports play a major role in satisfying demand: 56% in the power engineering industry, 72% in metallurgical equipment, 82% in hoisting and conveying machinery, 96% in railway machine-building, 51% in the electrical engineering industry, 82% in chemical and petroleum equipment, 95% in light industry equipment, 62% in metal-cutting and woodworking machine tools, 60% in domestic devices and machines, and 61% in electronics. The demand for other types of sophisticated equipment and many consumer goods is also satisfied by export. Export of knitted products (31%), clothing (34%), perfumes and cosmetics (79%), and produce (53%) is also high.

During the last few years, a number of operations in the republic have begun to manufacture products which have a higher degree of readiness. This has had a positive effect on production profitability. These ventures include: products refined from petroleum, a sector where export increased from 6% in 1982 to 25% in 1990; synthetic resins and plastics, increasing from 63 to 84%; mining equipment, which climbed from 9 to 32%; electrical-engineering products, from 34 to 39%; cable articles, from 1 to 20%; instruments, going from 3 to 10%; and a number of other types of machine-building industries. These changes, however, did not yet radically revise the import/export ratio.

Annually, Kazakhstan still exports 7-9 million tons of unprocessed grain,

as well as an average of 60% of the total volume of hides and skins, more than 70% of lint, and more than 60% of washed wool. Taking into account that this situation retards socioeconomic development, we worked out alternative methods to achieve a structural rearrangement of social production in Kazakhstan. The national economy needs to improve macroeconomic ratios in order to change the export composition of raw materials. This can be done by increasing the share of manufactured products that are exported. The national economy also requires that fundamental structural changes take place within the branches. We used the national income maximization and the achievement of a balance between the national economy and national income as a criterion for the optimization of the national economic structure.

The most urgent structural problem is the capital construction process. From 1986 to 1990 capital investments in the national economy were (in comparable prices) 62.7 billion rubles, which is almost 30% higher than in the preceding five years. Basic assets amounting to 55.7 billion rubles were introduced. Most of the construction companies mastered new principles of economic management and improved their work. They met the capital construction and contract work targets, amounting to 33.2 billion rubles in 1986-1990 (compared to 27.7 billion rubles in comparable prices, in the previous five years).

In order to concentrate capital investments at starting and transient construction projects, we tried to reduce the number of construction starts. For instance, in 1990, as compared to 1985, the number of industrial construction projects was reduced by 12%. During this time, an average capital investment in one construction project increased from 2.5 to 4 billion rubles. An average time-frame for construction was reduced by 17%. Nine billion rubles were assigned for technical re-equipment and reconstruction of the operating enterprises, which is 35% of the capital investment in industrial construction.

A great amount of work has gone into strengthening the material and technical foundation of the construction industry. During the period of 1986-1990, almost 2.2 billion rubles were allocated to this, which is an 80% increase as compared to the last five-year plan. In this period, new integrated house-building factories went up in the towns of Atyrau, Taldykorgan, and Oktyabr'sk, and the operating capacities of plants in Karaganda, Kzyl-Orda and other towns were expanded. Factories fitted with imported equipment for producing ceramic tiling materials have been put into operation in Zhezkazgan and Yermak, with a capacity of 60 millions of reference bricks per year. The capacity of the

Mangistau industrial company, involved in mining and processing shellrock, has been increased. Thanks to new facilities and upgraded operating plants, cement production increased by 10% in 1990, as compared to 1985. The production of roofing slate, soft roofing materials, linoleum, and sanitary articles increased appreciably. In the near future, it is expected to meet the republic's demand for linoleum, baths, ceramic sanitary articles, and so on. Within five years, it should eliminate shortages in principal building materials, except for glass and bricks.

The situation in the construction industry, however, is deleterious to the economy's improvement. From 1986 to 1990, basic assets valued at 89 kopeks per ruble of state capital investment were instituted, as compared to the 95 kopeks set out by the plan. Annually, one third of important projects were not put into operation. Estimating the work of contract building organizations according to gross indices indicates that the initial stages of construction took place. This results in the more unfinished projects, at the same time that the normative periods for the majority of them have already elapsed (Table 7).

Table 7

Unfinished projects (on January 1, 1991)

	rubles ---------- Norm	Actual	
In all of Kazakhstan	11,026	73	90
Including:			
enterprises of the former all-Union ministries and departments	6473	-	142

Many unfinished construction projects are located at the Tengiz petroleum deposit, the Kairaktin mining and metallurgical integrated plant, and the Ekibastuz hydroelectric power plant, which have been under construction for a long time. Unfinished construction at these enterprises amounts to 1.5 billion rubles. The rise in unfinished construction created a large stock of unused equipment. The stock exceeded 545 billion rubles by January 1, 1990, including 10% of unused equipment, which has been stored since 1983 and even before.

Building materials, construction projects and manufactured goods do not

fully satisfy demand. There is a particularly acute shortage of building materials in the West-Kazakhstan, Atyrau, Aktyubinsk, Zhezkazgan, and Kzyl-Orda regions. Due to the shortage in building materials and construction projects, the industrial construction supply and construction industries have insufficient capacities. Production of joiner's work, bricks, and prefabricated reinforced concrete are used to 73-80% of capacity; porous aggregates to 85%; and cement and lime to 90%. Integrated house-building factories are utilized to 88% of capacity. It has been calculated that only if there is full utilization of capacity can the factories supply the required 800,000 cubic meters of cement, 630 million of bricks, 500,000 cubic meters of other building materials, 2 million cubic meters of crushed rock and gravel, and 1 million cubic meters of prefabricated reinforced concrete.

Structural transformations in the national economy, based on resource-saving, dovetail with the new technical policy. In order to intensively develop the economy, Kazakhstan is instituting measures calling for technical re-equipment and reconstruction of operating enterprises, development of science-based facilities, and manufacturing new types of materials and equipment. From 1986 to 1990, more than 900 shops, bays, and facilities were mechanized and automated, and more than 850 mechanized automatic production lines were established. During this period, 13,500 new articles were produced, including many consumer goods. About 7000 new production procedures were introduced, including 1000 low-waste, waste-free, and resource-saving processes.

As a whole, the technical level of many types of industrial production has increased in the republic. For example, the production of rolled metal with hardening thermal treatment has increased. A sufficiently high level of basic oxygen and electric steel output is maintained in the total volume of melting (80% in 1990). The fuel-power sector has implemented the state order for petroleum extraction from the interior of the earth, making use of modern thermal, physicochemical, and hydrodynamic resource-saving methods. At the same time, the level of scientific and technological development does not meet the current requirements and the material production branches do not carry out technical experiments. The main reasons for this are the absence of a mechanism for accelerating scientific and technological progress, the lack of competition, and the fact that the manufacturers have monopolies. The experimental scientific foundation remains practically unchanged, preventing the completion and introduction of scientific developments.

Kazakhstan's national economy has a significant demand for modern highly productive equipment, machines and instruments, and advanced production processes. However, the machine-building enterprises, which must promote scientific and technological progress in the republic, are not prepared to technically re-equip the national industries, or even their own facilities. Their structure and technical level are simply inadequate for this task. In 1990, only 10% of their output consisted of the new products.

The effective depreciation norms do not increase the equipment retirement coefficient, which amounted to 3.0% in 1990, and in industry only 1.6%. In Kazakhstan, metal-cutting machine tools were retired after an average of 16 years, and press-forging machines were retired after 15 years. The Shymkent cotton integrated works, Semipalatinsk textile knitting industrial-trade company, Ushtobinsk, Ayaguz, Shchuchinsk, Kustanai, Atyrau, and Akmola meat-packing plants, etc., use more than 50% of worn-out equipment.

At operating industrial enterprises, 43% of metal-cutting equipment, 35% of press-forging equipment, and 40% of foundry equipment does not meet standard requirements. At individual machine-building plants, the specific weight of production equipment corresponding to the world standard amounts to 0.04% of the total amount at AZTM, 2.2% at the Chimkent company which manufactures press-forging equipment, 3.4% at the Alma-Ata Porshen' plant, and 13.4% at the Shymkent cardan shaft plant. The specific mass of many types of domestic equipment is 1.1-3.5 times higher than that of foreign equipment, specific energy consumption is 3-3.5 times higher, and production area per unit of productivity is 2.4-10 times greater.

The current multistep method for financing science and technology is inefficient. The programs for scientific and technical development, which are under the auspices of different ministries and departments, do not have proper control over the financing process. Programs to introduce new engineering techniques and technology are constantly being disrupted. In 1990, they were implemented by 65% and 76%, respectively. A share of the profit increment from introducing scientific and technical advances was only 4%. This adversely affects production. For instance, the level of capital productivity in national income, above the national economy of the republic, was one of the lowest in the former Soviet Union and amounted to 25 kopeks as compared to 35 kopeks in 1990.

Production efficiency growth is retarded by inopportune development and incomplete utilization of production capacities. Due to this, industrial enterprises

annually manufacture fewer products than they were expected to produce, totalling 1.5 billion rubles. Only 30% of this sum can be recreated, and the rest is irretrievable. It is attributable to errors in design, the disparity between actual and assumed mineral reserves, disparities in principal conversions, and construction defects.

In 1990, 1 ruble and 30 kopeks (in actual prices) of material resources (including depreciation) were spent to produce 1 ruble of national income. Over-expenditure of material resources in the republic ranges up to 3 billion rubles with respect to an average annual national income. The specific materials consumption in the national income was 62.7 kopeks in 1990, i.e. up by 0.9 kopek as compared to 1985. This is equal to the loss of 600 million rubles from the produced national income. As the analysis has demonstrated, the level of specific consumption of materials was adversely affected by the growth in depreciation, caused by an increase in equipment costs as compared to productivity. When large enterprises have monopolies, they are able to overvalue the equipment they produce. For example, the price of a sewing machine from the Podol'sk factory increased 3.3 times during this period, while the price of a cut-out machine increased 8 times, with productivity and reliability in service remaining identical.

The inadequate growth of the national income is in many respects the result of extensive methods of economic management. Analyzing the outcome of the industrial programs, we see that there was no radical change in resource-saving. Because of the low level of production processes at many machine-building and construction enterprises, there has been no reduction in waste of material resources over the last few years. For this reason alone, in 1990 the republic lost 8000 tons of rolled ferrous metals, 65,000 tons of cement, and 10,000 cubic meters of lumber. In the construction industry, more than 1 million tons of rolled metal, 6 million tons of cement, and 2 million cubic meters of lumber are frozen in unfinished projects. Incomplete use of equipment and violations of production codes result in the over-expenditure of fuel and power resources, adding up to 400 thousand tons of equivalent fuel per year.

As before, large quantities of material resources are lost due to incomplete processing and a low level of waste utilization. For instance, Kazakhstan reached only 71% of the established target for phosphogypsum utilization, and only 87% of the established target for utilization of flotation tailings and enriching nonferrous metal ores. There was almost no reduction in the specific weight of raw waste lumber which is incinerated and dumped. It has attained

11% and more than 14% at the enterprises of Kokchetav, west-Kazakhstan and Shymkent regions, 24% in Akmolinsk region, and 28% in Taldykorgan. For this reason, more than 6 million cubic meters of industrial wood have been lost in the five-year period.

Because many branches do not produce the correct amounts of highly efficient products, resource-saving is retarded there. During the five-year period, the chemical and lumber enterprises have not reached their annual targets for the production of thermoplastic pipes, which could efficiently replace steel pipes. Ferrous metallurgy plants do not systematically manufacture the given product mix, starting with economical kinds of rolled ferrous metals.

The above analysis shows that even a maximal use of the administrative-commanding economy cannot solve Kazakhstan's economic problems. The old system of control has totally exhausted itself and is unable to provide the necessary structural changes.

Resource-saving development goes hand-in-hand with the formation of market relations. Many enterprises use their exclusive position to dictate their conditions. Metal, component parts, and building materials suppliers often demand a material incentive, hard-to-get products, or currency. This complicates the formation of normal market commodity money relations and leads to a barter system.

Structural transformations are extremely important for Kazakhstan's agribusiness complex, a sector where certain positive changes have been achieved in the last five years. From 1986 to 1990 the average annual gross agricultural production increased by 16%, as compared to the last five-year plan, including 17% in the public sector and 15% in the private sector. The average annual gross harvest of cereal crops increased by 20%, sunflower by 25%, potatoes by 8%, vegetables by 12%, and fruits and berries by 11%. High-tech crop cultivation has been introduced in farms. In 1990 the area of spring wheat cultivated by this method attained 40% of the total sowing area, and harvest increment was 2.5 centners per 1 hectare.

At the same time, the level of production of some agricultural products is lower than expected. There are significant losses during harvesting and storing. About 5 million hectares of ploughed land lie fallow, and there is no appropriate soil management. Violations of agricultural and technological guidelines lower the efficiency of fertilizers. For this reason, soil fertility declines and arable land is destroyed. Proper crop rotations are introduced slowly, and only 80% are developed in the republic.

In 1990, our republic had 2308 thousand hectares of irrigated land, about 90 thousand hectares of which were not farmed because the soil was saline, swampy, or had a faulty irrigation system. Moreover, in 1990 about 40 thousand hectares of crops were not watered. For these reasons alone, agricultural products were down by 100 million rubles during the last few years, calculated by average productivity of irrigated hectare.

Analysis of stock breeding development shows that upkeep and feeding of cattle improved, and breeds of cattle which are extremely productive and can overcome infectious diseases have been introduced. Grain fodder stocking increased by 2.5 times as compared to the previous five-year period, which had a favorable effect on livestock products production. During the years 1986 to 1990 targets for the production of meat, milk, and eggs were met. The average annual production of meat in all types of farms was 1.46 million tons, as compared to 1.16 million tons in 1981-1985; milk production was 5.35 million tons, compared to 4.6 million tons; egg production was 4.2 billion, compared to 3.6 billion. There was an important increase in livestock products production in the public sector. Private farms play an important role in increasing livestock products production. Thus, the production of meat in these farms in 1990 increased by more than 40%, milk by 18%, and eggs by 7%, as compared to 1985.

Qualitative structural changes in the economy of Kazakhstan are associated with the development of the social sphere. Here the most pressing problem is the saturation of the market with consumer goods and services. From 1986 to 1990, output of non-food goods increased by 48%, as compared to the 25% which was planned by the complex program. An increase in indices was followed by similar production growth, including 12% for cotton cloth, 20% for woolen cloth, 21% for sewn products, and 13% for footwear. This enabled consumer goods production per capita to increase from 481 rubles in 1985 to 689 rubles in 1990. Measures were enacted to improve production and strengthen the material and technical foundations of the branches manufacturing consumer goods. Light industry plants were opened, such as the clothing factory in Alma-Ata, footwear factories in Semipalatinsk and Taldykorgan, and clothing factories in Kustanai and Alma-Ata.

The republic took the initiative to create additional capacity by opening branches (shops) in prefabricated buildings (modules). Twenty-five branches of light industrial enterprises and a number of shops (branches) in other industries were opened. Construction of 4 buildings which use ferroconcrete structures has

begun in Shymkent, Kzyl-Orda, and Zhambyl. A number of administrative buildings and buildings that were once occupied by the former departments of internal affairs in Zhanatas and Ekibastuz and military units in Aktau and Kurdai are now used to manufacture goods. Work continued on the joint development of non-food production at heavy industry enterprises. Practically all the companies in the Union were involved in producing commodities or component parts. In 1990, a share of commodities in the production of non-food items (not including light industry articles) amounted to 55%. More than 60 types of cultural and household goods, including 18 technically complicated products, were produced. These include "Malyutka" and "Beryozka" washing machines , small electric clippers, sports training devices, electric motors for vacuum cleaners, centrifuges for wringing out linen, "Medeo" stereophonic radio/tape recorders, bicycles, and car trailers.

We must admit, however, that these results did not radically improve market saturation. In 1990, unsatisfied demand amounted to 3 billion rubles, including 1.6 billion rubles for non-food items. More than 20 thousand types of goods, worth 6 billion rubles, were imported to the republic, equal to 40% of market funds. Until now there has been a trend to improve the consumer market by importing commodities from other regions, a measure which is often unprofitable. A number of industrially developed regions of Kazakhstan produce 1.5-2 times fewer non-food items per capita than the average in the republic.

The process of revamping production, completing old projects and building new ones, including prefabricated buildings, is proceeding too slowly. The work to build and reconstruct factories that produce commodities has been inadequate. (Examples include the clothing factory in Novyi Uzen', a branch of the textile-clothing company in Dzhetygara, the clothing-knitting mill in Rudnyi, the carpet-weaving mill in Taldykorgan, the footwear factory in Kzyl Orda, and the dying-decorative enterprise belonging to the knitting company in Alma-Ata).

The local industry is not being developed uniformly in the republic. The introduction of commodity production varies widely from region to region. The reserves for processing waste and local raw materials are not completely exploited. The specific weight of these products in 1990 was only 7.1% of the total volume of the products. The material and technical foundation for the utilization of local raw materials is extremely weak.

One of the principal aims of social development is to provide people with apartments. From 1986 to 1990, Kazakhstan built homes with a total area of 40.3 million square meters, 8.8 million square meters more than during the

previous five years. The number of people waiting for apartments was reduced by 60%. At the same time, in apartments per capita (13.5 square meters), the republic occupied tenth place in the former Soviet Union, ahead of the Central Asian republics and Armenia. In the last few years, the number of individual housing units has increased. In 1986-1990 it accounted for 12%, as compared to 8.7% in the previous five years.

The republic has also lower indices in public services. Thus, by specific dwelling space, water pipe delays are equal to 1.5 basic points, sewage to 2.8 basic points, hot water supply to 4.8 basic points, and bathrooms to 3.6 basic points. At the beginning of 1991, the republic had more than 5 million square meters of the total area of dilapidated housing, or 3.4% of the total area. The average figures for dilapidated housing in the former Soviet Union were 1.8%, in Kyrgyzstan 1.4%, and in Tadjikistan 1.6%. Work on eliminating this problem is carried out too slowly. In 1990, only 410,000 square meters of dilapidated houses were eliminated and 23,000 people resettled. The development of the water works and enlarged water pipe capacities have made it possible to increase average daily water consumption per town dweller by 9% in 1990, as compared to 1985. However 26 settlements, 2 towns, and 85% of villages did not have a water supply.

During the period of 1986 to 1990, Kazakhstan opened schools for more than 520,000 pupils. This exceeded its target by 7.5% and provided 250,000 more spaces for pupils than in the previous five years. At the same time, the situation was not appreciably improved; 50% of schools in the republic are located in converted buildings and 3% in crumbling structures.

The problem of spaces in nursery schools is still pressing. Every year, more children are turned away from nursery schools. In 1990, 185 thousand children did not receive a space in a nursery school, 50 thousand more than in 1985. For every 109 children, there are 100 openings in nursery schools. At the same time, in the period of 1986 to 1990, 200 thousand kindergarten spaces were opened, 70 thousand more than in the previous five years.

We are striving to find additional resources to develop cultural institutions. More than 30 million rubles of capital investments have been earmarked for this purpose, above the specifics detailed in the five-year plan. Considerable sums have been allocated to public health service development. In a five-year period, more than 30 regional hospitals, clinics, and other public health service facilities have been opened. District hospitals and anti-tuberculosis dispensaries are working in high quality buildings. Hospital buildings replaced crumbling

structures. Therefore, in 1990, 134 beds were provided for 10,000 people, which corresponds to the average all-Union index. There are positive changes in the public health service. Diagnostic centers have opened in Zhambyl, Alma-Ata, Semipalatinsk, Kzyl-Orda, Shymkent, Ekibastuz, and Karaganda.

Resource-saving development provides for the protection and rational use of natural resources. During the period of 1986 to 1990, Kazakhstan opened sewage purification works with a total capacity of 1.2 million cubic meters per day, and water circulation systems with a capacity of 2 million cubic meters per day. On the whole, by the end of 1990, the total capacity of purification works in the republic amounted to 1.7 million cubic meters. These capacities, however, are insufficient, and the level of pollution in the Irtysh, Ural and Nura rivers (and their creeks) remains high. Yet, during the period under consideration, the copper and zinc content stabilized and the petroleum products content was reduced. The level of ions of base metals in the Irtysh, Ul'ba, Glubochanka, and Breksa rivers is extremely high. This resulted from the flaws in the water circulation system and purification works at the Leninogorsk polymetallic integrated works, the Zyryanovsk lead integrated works (construction of the purification works took more than 10 years), the Ust'-Kamenogorsk lead and zinc integrated works, and the Irtysh polymetallic integrated works. The Karbid company and the Karaganda iron and steel integrated works have polluted the Nura River and Samarkand reservoir so severely that the water can no longer be used.

Because for many years the Balkhashmed' company and other industrial enterprises have been polluting the environment and discharging unpurified sewage, many harmful substances have accumulated on the floor of Lake Balkhash. These substances will continue to affect the state of the lake. Public service facilities also contaminate water sources, and account for 70% of all sewage. As of 1991, Semipalatinsk had no plants engaged in the biological purification of sewage , purification plants operated double time in Pavlodar, and purification plants were overloaded by 30% in Pavlodar and Ust'-Kamenogorsk. Meanwhile, these towns are situated on the banks of the Irtysh River and their sewage flows into the river. Due to the absence of a final biological purification station, sewage from the town of Karaganda, which spews into the Nura River, does not meet sanitary standards. The volume of circulating water supply, which amounts to about two-thirds of the total volume of water consumption for production, is increasing at extremely slow rate. From 1986 to 1990, the volume of circulating water supply increased only by 6.1%, which made it possible to

save only 875 million cubic meters of fresh water.

Though different measures have been taken, they cannot alter the serious epidemiological and ecological condition of as large and complicated an inland reservoir as the Aral Sea and the entire Aral seaside complex. The drinking water supply is extremely inadequate. Thus, from nine water mains (from the 1988-1990 building period) and intra-settlement water-supply systems (1988-1995), which are 1222 kilometers long, only the Aral-Sarybulak and Kzyl-Orda right-bank group water pipes are being constructed. By the beginning of 1991, only 60 kilometers of intra-settlement water-supply systems were put into service.

There have been no appreciable results in sanitizing the air in the principal industrial centers of the republic. From 1986 to 1990 more than 110 million rubles were spent on air protection, and dust-gas purification plants were constructed with a total capacity of 7334 thousand cubic meters. These measures, however, were not effective. There has been no reduction in the number of towns with high levels of air pollution. Zhambyl, Shymkent, and Ust'-Kamenogorsk are annually ejecting more than 100 thousand tons of the most harmful substances into the air. This increases morbidity and provokes justified indignation. Karaganda ejects more than 160 thousand tons of harmful substances into the air, Balkhash about 350 thousand tons, and Pavlodar about 280 thousand tons. The towns Temirtau and Ekibastuz are the worst offenders: more than 900 and 800 thousand tons of harmful substances, respectively, are annually ejected into the atmosphere there.

After introducing such advanced technologies (in pyrometallurgical processes) as KIVTSET and liquid bath melting, we were extremely optimistic about the prospects of sanitizing the air in Ust'-Kamenogorsk and Balkhash. The process of completely converting the lead plant at the Ust'-Kamenogorsk lead and zinc integrated works and the Balkhash copper plant to these technologies was carried out extremely slowly. The program of combined measures has been approved for the Ekibastuz region, and sets 1993 as the deadline for reducing harmful ejections by 700 thousand tons, including 670 thousand tons of ash.

For the protection and the rational utilization of soil resources in Kazakhstan, efforts are underway to reduce the area of overturned and overworked soils, which account for 170 and 70 thousand hectares, respectively. Of the 29,000 hectares of overworked soil belonging to the agro-industrial complex, it restores only 2,000 hectares annually.

In order to provide a combined utilization of mineral resources, over a five-

year period industries in the republic used more than 250 million tons of mining waste as secondary raw materials. Products worth 2.3 billion rubles have been manufactured in this way. About 10 million tons of metallurgical slags were utilized using basic production methods. By processing overburden rock, the republic will get more than 5 million cubic meters of crushed rock for road repair.

When we analyzed the structural changes in the national economy of Kazakhstan, we concluded that positive results of social production efficiency can be achieved under the conditions of resource-saving economic and social development, in conjunction with new structural and investment policy based on resource-saving. The republic has vast reserves for saving and has achieved some positive experiences in utilizing them. This presents real possibilities for achieving a new level of material wealth and services, and raising the standard of living.

SECTION II
STRENGTHENING THE RECONSTRUCTION FUNCTION OF RESOURCE-SAVING

CHAPTER IV
ACCUMULATION MECHANISMS AT THE TIME OF RESOURCE-SAVING RECONSTRUCTION

The growth of the absolute value of national income and the variation in the ratio between consumption and accumulation are regularized as social production develops. In the accumulation fund, the portion of production accumulation, formed through resource-saving, acquires ever-increasing significance. In the future, the importance of this process in extended reconstruction will obviously increase. Under the conditions of scientific and technological progress, accumulation will considerably intensify extended reconstruction. This relationship is revealed in a new quality of economic development and is reflected in the reconstruction process with radical economic reforms and the transition to market relations. In theory, accumulation and extended reconstruction are considered to be a united process. Accumulation is a socially necessary and important progressive function of development.

A combination of economic laws specifies and controls the accumulation mechanisms for resource-saving reconstruction. In a discussion of the accumulation mechanisms, it is worthwhile to outline this economic category and the economic laws that control the process of resource-saving reconstruction.

Economic theory considers accumulation not only as a means of extended reconstruction of a product, but as a process of production relations reconstruction. This fundamental statement is especially important for the current time of political and economic reforms. The role of accumulation, as one of the most important strategic parameters in the national economy, is growing.

Researchers use different ways to describe accumulation as a scientific category. For instance, it is noted that accumulation is a conversion of a part of national income, or, more precisely, of a part of surplus product, into basic and circulating production assets. The category "accumulation" is thereby limited to the framework of material production. This definition excludes accumulation of the consumer portion of the gross social product used for accumulation. This concept considers only accumulation of the means of production and disregards the accumulation process and its results in Division II of social production.

Economic management has rejected this definition. Analysis demonstrates that the integral parts of accumulation are pure capital investments in material production; capital investments (gross) out of material production; and the growth of stock and reserves. When discussing the last category, we should note both accumulation and consumption.

With resource-saving reconstruction, resource-saving accumulation is characterized by a social type of production means and labor force. Accumulation is not only the process of "creating an excess of product over its consumption." [1] Under the conditions of developing various forms of property in means of production, the material potential is accumulated, as is potential in the form of workers' abilities. Direct production expands and refines resource-saving accumulation, and this must have new positive results. For number of objective and subjective reasons, this is not always achieved (Table 8).

Table 8

*Basic economic indices, making up resource-saving accumulation**

Index	USSR			Kazakhstan		
	1986	1988	1990	1986	1988	1990
Indices of the produced national income (1985-)	102.3	108.5	106.8	101.4 1	07.4	105.1
All capital investments	194.4 2	18.2	229.8	11.1	13.2	13.1

Table 8: (continuation)

Index	USSR			Kazakhstan		
	1986	1988	1990	1986	1988	1990
in comparable prices, billion rubles						
Putting into service basic assets in comparable prices, billion rubles	182.7	192.5	193.7	11.0	11.8	11.2
Number of workers and employees, millions	118.5 1	17.2	112.9	6.6	6.6	6.5
Productivity indices (1985-)	102.1	108.5	107.4	100.9	104.0	101.1

* Calculated from the following materials: *National Economy of the USSR in 1990*, (Moscow: Financy i statistika, 1991), pp. 12 100, 545, 547, 551, 553, 563 [Russian], and the author's data.

This table demonstrates that the rates of the national income increment and of accumulation depend on capital investments, putting basic assets into service, the number of workers, and social labor productivity. Dependence on these factors was typical of the former Soviet Union in general, and of Kazakhstan in the previous five years, as is shown in Table 8. This indicates that it is necessary to radically change the accumulation utilization for resource-saving, and thereby to increase production. Thus, resource-saving accumulation efficiency is a global problem.

At the same time, this allows us to state that there are no sufficient grounds to limit the *resource-saving accumulation* category only by material production, because this disregards the accumulation of the consumer's part of the social product, used for accumulation and articles for personal use. This would mean that only accumulation of means of production is assumed, while resource-saving accumulation and its results in Division II of social production are not.

Resource-saving accumulation is an integral part of the reconstruction increase. Its most important features are described below. The role of resource-saving accumulation is an important component in the economic structure of the society and the development of its material and technical base. Theoretical substantiation of this statement is given in work [2]: With a growth in organic production, a relative share of the national income in the gross social product may be reduced, but its absolute value increases. Data from the twenty-year period 1970-1990 demonstrate that national income has increased by 2.3 times and the other part of the gross product has increased by 2.7 times. The role and significance of the compensation fund increase, and its function in the reconstruction increase, changes qualitatively, particularly as a result of resource-saving accumulation.

The present stage of economic and social development is characterized by a growing dependence between accumulation and compensation. This statement is important both theoretically and methodologically for the efficient materialization of the resource-saving accumulation and its function in increased production. This is especially important for constructing interbranch balances. What is the role of compensation in the accumulation process? The dynamics of compensation depend on the accumulation of production assets. The better the resource-saving equipment is used, the higher is the level of its discard, and therefore, the greater portion of the gross social product is used for compensating means of labor. Statistical data for the last 20 years describe an absolute and relative growth in compensation. Thus, the growth of compensation and its use for extended reconstruction is a necessary condition for continuity of the production process and resource-saving accumulation.

In this connection, the analysis of the relationship between accumulation dynamics and compensation is very important. A share of the compensation fund in the social product is continuously growing: 55% (in current prices) in 1970, 57% in 1980, and 60% in 1990. The total compensation fund includes not only expenses for labor, but also compensation of the basic production assets (amortization fund). The amortization share in the compensation fund is usually determined by the capital intensiveness of the gross social product. If it increases, the amortization share also increases, and vice versa. Note, however, that a share of the compensation fund in the social product also depends on production capital per worker.

The growth of funds for equipping workplaces leads to an increase in the amortization share in the national income and, hence, to a gradual increase of the

level of compensation in the gross social product. An increase in the share of compensation in the social product does not imply a reduction of a share of national income in the social product. A growth in social labor productivity is expressed by an increase in the mass of the produced use values. If this is followed by an increase in capital productivity, i.e. the quantity of products taken from each ruble of the basic production assets, then an increase of the compensation fund's share (material expenses) in the gross social product may lag behind the growth of the physical volume of the national income. The dependence given here is confirmed by comparative data of the growth of physical volume of the gross social product and the national income for a prolonged period during the national economic development of the former Soviet Union.

The importance of the growth of the role of compensation fund in the process of resource-saving accumulation and increasing production is both economic and social. Increasing production accumulation through compensation will increase the share of the national income earmarked for personal consumption, allow increased production of consumer goods, and encourage the development of the non-material sphere. The structure of the consumption fund itself will vary, the ratios between its production and nonproduction parts will change, and there will be a positive effect on the resource-saving type of the extended reconstruction.

The introduction of scientific achievements can also create mechanisms for resource-saving accumulation. Science plays an increasingly important role in the development of production means and related technology. In priority fields of industry, 25% of the product cost is spent on scientific investigations. The research expenses allocated from the state budget and other sources should be considerably increased in the near future. Scientific advances will be realized in the reconstruction of basic assets. The economic effects of the introduction of scientific developments will involve fundamentally new equipment and advanced technologies. The automation of production and the introduction of automated control systems, which must be increased by at least 2-3 times, will have considerable impact on the economy. Robotics, rotary and rotary-conveyor lines, and flexible automated productions must be developed rapidly.

The process of the accumulation of new resource-saving equipment must be accompanied by radical changes in the labor force (as a direct consequence of the further development of physics, chemistry, and biology). Materials with fundamentally new and enhanced physicochemical characteristics should be

created in order to satisfy the material requirements of the population and to produce highly efficient equipment. Therefore, materials, namely circulating assets, will be an active element in increasing reconstruction during resource-saving accumulation. At the same time, the established production processes must be replaced by fundamentally new ones. In the metal-working industry, for example, cutting should be replaced by highly efficient methods of plastic deformation. Electroerosion, discharge, ultrasound, and chemical treatment of metals should be introduced. Promising methods for mining metals, salts, and rare elements should be developed, and this will have a considerable effect on the economy. Promising technologies in each industry should be increased by 2-3 times, specifically membranous, laser, and plasma technology which employ superhigh pressures, pulse load technologies, and so on.

Resource-saving accumulation is also characterized by optimization of capital investments for high-quality renovation of the basic production assets. During the transition to market relations, the growth of investment activity will have a positive effect on the economy, especially in machine-building, heavy industry, power engineering, and agriculture. Machines, equipment, and machine tools, i.e. the most active part of assets, often remain idle or under-used. If industry took full advantage of these assets, in heavy industry alone it would be possible to double the rate of product increment.

Qualitative structural changes depend on technical re-equipment and the modernization of operating production. According to available data, specific capital investments in the modernization of industrial enterprises average 10%, or sometimes 20-25%, lower than in new construction. Therefore, the process of resource-saving accumulation is accompanied by ever-increasing change in investment dynamics. While 23.8 billion rubles were invested in technical re-equipment and modernization in 1980, more than 50 billion rubles were invested in 1990. By 1990, these capital costs amounted to 45% of the total investments. We can assume that in the foreseeable future the resource-saving accumulation mechanism will influence growth to an optimum level of capital investments in technical re-equipment and modernization of the operating enterprises.

This mechanism, however, cannot oppose the modernization of operating enterprises and new construction. The two sides of the process of production increase must not be elevated to an absolute. Sometimes the construction of new enterprises is the best decision; others, the modernization of the operating enterprises is more advantageous. New construction facilitates a rational arrangement of production forces, more complete development of natural

resources, the creation of new generations of equipment and technology, construction of a modern infrastructure, and instituting measures for nature protection. These steps are accelerated with the transition to market conditions.

The accelerated discarding of basic production assets also affects the structure of capital investments. This is caused by the necessity of introducing low waste and waste-free technologies, energy-saving and conservation techniques, and resource-saving equipment. An accelerated discard of the basic production assets is a prerequisite for enhancing social productivity. Discarding the basic production assets, however, plays a secondary role in the renovation process and is typical of almost all industries of the national economy.

The rate of discarding all basic production assets fell from 2.3% in 1970 to 2.1 in 1990; the rate of discarding industrial-production basic assets, fell from 1.9 to 1%. As a result, outdated equipment is gradually accumulating. At present, the ratio of the basic assets discard to annual capital production costs is approximately 25%. Therefore, some investigators suggest raising this index to 35%. [3] Leaving aside this controversial question, we note that it is necessary to acquire a scientifically justified policy for discarding basic production assets. That is why resource-saving accumulation and accelerated substitution of the production apparatus make it possible to largely achieve expected productivity enhancement and provide a product increment, together with labor saving.

The economic mechanism of resource-saving accumulation is also characterized by the development of foreign economic ties between Kazakhstan and other countries, encouraged by new principles of international relations. Obviously, the international aspect of the resource-saving accumulation, and specifically the resource-saving development of production to enter the international market, will be strengthened in the future.

As the international division of labor improves, it is likely that this process will acquire a number of new features. On the basis of a controlled utilization of investments, the national economic structure will become more rational, approaching the optimum one. One state can provide constantly increasing capital investments to be used in other countries. The number of multilateral agreements on joint construction and operation of national economic projects will increase. These projects, which will remain the national property of the country, will enhance the efficiency of the resource-saving materialized means for the world community.

A growth of the resource-saving reconstruction function has other unique features. Contributing factors include radical economic reform, the formation of

market relations, and the transition to intensive economic development under the influence of international division of labor. Resource-saving accumulation is an important socioeconomic factor here. It helps improve economic management, solve radical problems of improving production, and upgrade the professional skills of workers. Moreover, an ever-increasing share of resources is intended for improving labor conditions.

The social aspect of resource-saving accumulation will be particularly strengthened thanks to dramatic economic and political changes in the society. Production and wealth will not be based on a person's actual labor or hours of work, but on his productive capacity, his understanding of nature and his role as a social being, in short, the development of a social creature. The person himself and his personality development become the main source of wealth, and an efficient resource-saving accumulation will be the material base of this wealth.

We have considered the principle of resource-saving accumulation and the growth of its reconstruction function in this context, as determined by the mechanisms of this process. This approach is necessary, but these mechanisms must be studied as they work in reality. In economics, this is approach is useful in the regulation of economic laws on reconstruction intensification. In this connection, many scientists believe that a system for providing an overall understanding of the laws and their uses has not yet been developed. It is necessary to know how the objective economic laws can be realized.

A theoretical statement that expresses the essence of the phenomena is very important for a scientific representation of these problems. In reality, the interrelationships and interdependencies are only reflected in the laws, not completely described in them. Therefore, it is necessary to first analyze the mechanisms of resource-saving accumulation, and then to show how they are formed under the action of economic laws, and, finally, to present resource-saving reconstruction. This requires an understanding of the essence of each economic law, as well as all the mechanisms of the accumulation process.

The performance of the economic laws during resource-saving accumulation is illustrated in the combination of interrelated objective forms and is determined by production relations. While investigating the mechanisms of reconstruction increase, we should distinguish the accumulation law in the system of economic laws. This approach is explained by the fact that at the present stage, the system of economic laws and the accumulation law create objective conditions for the following: reconstruction increase on the basis of optimum growth of funds; production capital per worker; the productivity of

production capital; improvement in economic efficiency as a result of the transition to new forms of management; and improvement of the social conditions of labor including rational occupations and a growth in the material and cultural levels of the standard of living. The method of implementing these objective possibilities, however, is somewhat contradictory (Table 9).

Table 9

*Indices of extended reconstruction in the USSR**

Index	1970	1975	1980	1985	1990
Gross national product, billion rubles	-	-	-	777.0	1000
National income, used for consumption and accumulation, billion rubles	285.5	363.0	454.1	568.7	704.3
Including:					
consumption	201.3	266.4	345.5	418.4	558.6
accumulation	84.2	96.6	108.6	150.3	145.7
and other expenses					
Population, millions	241.7	253.3	264.5	275.9	288.6
Per capita consumption of national income, rubles	11812	14331	17168	20613	24278
All capital investments in comparable prices, billion rubles	92.2	128.5	150.9	179.5	229.8

* Calculated from the following materials: *National Economy of the USSR in 1990*, (Moscow: Financy i statistika, 1991), pp. 9, 13, 67, 551, 553 [Russian], and the author's data.

National income is characterized by absolute growth and the dynamics of the ratio of consumption to accumulation, two interrelated and contradictory elements. Accumulation increases to an optimum level with an increase in consumption and satisfying growing social and personal needs. This means that the ratio of consumption to accumulation also expresses how the economic laws

affect resource-saving reconstruction. When the means of production are being developed, the growth of the accumulation fund does not contradict the manufacturers' interests; it has similar importance to the current personal consumption fund. Separation of this fund from the general product is a necessity, and establishes certain boundaries for the consumption fund.

This statement is confirmed by practice: increased consumption contributes to improved social services, a higher level of knowledge, better qualified workers, etc. This has a positive influence on production efficiency. An increase in resource-saving accumulation therefore becomes possible. This means that the consumption fund is not a passive part of national income and is not only a source of personal consumption, but is rather an active factor in extended resource-saving reconstruction, which paves the way for qualitative economic growth. The interrelationship with the accumulation fund also affects consumption, since its dynamics are determined by the conditions of extended reconstruction. In economic development, resource-saving accumulation is not an end in itself, but an element in creating the material conditions which will satisfy the growing needs of the people. In this context, some scientists believe that the decisive side of reconstruction is determined by economic laws and is based on the accumulation of new machinery.

We agree with the economists' opinion [4] that the mechanisms and the continuous expansion and improvement of production must be based on advanced technology, as a factor in satisfying the ever-growing demands and comprehensive development of all members of the society. [5] The statement, "In bourgeois society concrete labor is only a means to increase accumulated labor," [6] should not become a dogma. In any society, accumulated labor is only a means to prolong and enrich the lives of its members. Thus, a continuous expansion of resource-saving accumulation and improved efficiency are necessary for ever-growing popular consumption. Other economic actions become understandable in the process of extended reconstruction.

Table 8 demonstrates that from 1970 to 1990, the national income of the former Soviet Union grew considerably. This income was used for accumulation and consumption, with an equal increase in capital investments in the national economy. The productivity increment, however, decreased by 1.2 times during the last 15 years, and the gross national product increment fell by 1.5 times. There are also negative trends: per capita consumption of the national income is slowing down. The dynamics of real income of the population is a particular source of anxiety. According to statistical data, real income in 1986 amounted to

264% as compared to 1960, to 167% as compared to 1970, and to 114% as compared to 1980. In 1990, cash income in the former Soviet Union increased by 123.7 billion rubles as compared to 1986. This rate, however, exceeded the expenses for goods and services by 1.5 times. Qualitative economic changes and a more dynamic national income are required in order to achieve positive results. Its future increment rate should go up to 5%. This will make it possible to efficiently solve large-scale economic and social problems. It is also necessary to accelerate the formation of a more harmonious production structure, which will correspond to growing and changing social needs. The principal avenue to increase goods and services is to quickly create a powerful consumer goods industry and an appropriate market mechanism.

The accumulation law, which is closely interrelated to the system of economic laws, has a profound effect on the reconstruction increase. Investigators describe this in different ways. One study posits that the accumulation law "expresses the necessity, inwardly typical of . . . economy, of optimum accumulation of socialist wealth by turning a part of the reconstructed social product into new elements of wealth, in combination with the maximal nonproduction consumption of another part, both during the current period and during subsequent periods of economic activity . . ." [7] The author underlines optimum "accumulation . . . of wealth" and asserts that is necessary to specify the conditions for the "accumulation of wealth by turning part of . . . a product into new elements of wealth" and "in combination with a maximal nonproduction consumption of another part," and so on.

When we critically appraise these statements, we note that collective enterprises are a subject of accumulation (including resource-saving accumulation) in the society. In the given case, the accumulation law expresses an objective necessity for improving accumulation for the purpose of increasing workers' welfare, and not only the growth of national wealth. Therefore, as social production develops and the transition to a market economy is achieved, a social mechanism for using the accumulation law and its resource-saving action will be improved, as a condition for accelerating scientific and technological progress.

When the economic conditions are created for the enhancement of productivity and production efficiency, accomplishing the objective purpose of production is closely connected with resource-saving accumulation and employment. [8] In the final analysis, the economy requires time to produce additional goods. This characterizes the ratio of the accumulation process to the

law of time-saving.

Some authors note that an economic law of accumulation expresses an objective necessity (and possibility) of not only increasing national wealth, but of substantially upgrading the material conditions for enlarging and improving the material and technical base. This would create more efficient cooperation between associated manufacturers, in order to improve the welfare of all members of society. Here accumulation is shown as a category of the production process, expressed in the processes of distribution and consumption.

The nature of the accumulation law should be viewed in the context of the development of economically different forms of property relations, in order to satisfy the growing needs of the society. This requires efficient accumulation in the resource-saving process, not only on the local level, but internationally as well.

The given mechanisms, which reveal the influence of the accumulation law on the reconstruction increase, can be described, to a certain extent, by the following economic indices (Table 10).

Table 10

*Dynamics of indices, describing the accumulation law in the extended reconstruction of the USSR (1970 - 1990)**

Index	1975	1980	1985	1990
National income used for consumption and accumulation in comparable prices	127	150	199	217
Including:				
- accumulation and other expenses	115	129	179	174
- basic production assets	152	217	296	373
- production capital per labor	133	181	238	285
Capital productivity (in national income)	84	74	68	68
Social labor productivity	125	147	170	187

* Calculated from the following materials: *National Economy of the USSR in 1989*, (Moscow: Financy i statistika, 1991), pp. 13, 289 [Russian], and the author's data.

Huge accumulations were assigned to economic development, amounting to 150.3 billion rubles in 1990, and the growth rate of the basic production assets exceeds the growth rate of the national income. Therefore, despite the fact that the production capital per labor has increased, an objective condition for reducing capital productivity has been created. During the period 1970-1990, the national income from a unit cost of basic production assets fell from 54 to 36 kopeks. This use of production machinery does not reflect the mechanism of the accumulation law in resource-saving production. A reduction in capital productivity has a negative influence on social production growth and efficiency. In the future, it will be necessary to change the dynamics of this index, first to stabilize capital productivity, and then to provide for growth.

The following figure describe the actual dynamics of the technical structure of production: production capital per industrial and production worker increased in 1990 by 1.7 times as compared to 1980. The average annual number of employees has fallen by 1.5% and an average salary increment has considerably exceeded the productivity increment. Here productivity deserves particular consideration. Development of social labor productivity, based on scientific and technological progress, becomes the most important accumulation factor. The law of increasing productivity in a specific form also holds true under the conditions of resource-saving reconstruction (see Table 10).

Productivity enhancement is the most important factor in determining the amount of accumulation. It also improves the technical and economic indices of the production machinery, which provides the material basis for productivity enhancement and increasing resource-saving accumulation. In this context, we take issue with the researchers, who do not profoundly analyze social labor productivity enhancement, while considering the role played by the accumulation law. There is great potential here for increasing the action of the accumulation law for resource-saving reconstruction. However, during 1986-1990, as compared to 1970-1980, the productivity increment fell from 3.3 to 2.7%, and accumulation, in the form of basic production assets, grew by 6 times. This ratio negatively reflects the mechanism of the accumulation law in the resource-saving process; productivity, for example must be increased by 2.3-2.5 times by the year 2000.

The most important mechanism of the accumulation law is a rational distribution of capital investments between subdivisions of social production and between Group A and Group B in industry. The growing rate of investment increment in the consumer goods branches is justified under the conditions of

economic social re-orientation.

The importance of amortization increases. This is an essential property of resource-saving accumulation in extended reconstruction. Here, we should consider the distinction between pure capital investments in the total material production, representing a considerable part of accumulation, and capital costs in certain branches of production, which are gross capital investments. Economically, this distinction means that the gross capital investments are formed not only from surplus products, like net capital investments, but from amortization as well, as a part of the compensation from social production. Consequently, gross capital investments are a sum of all capital investments for compensating and extending basic production assets. Net capital investments are the gross capital costs without amortization, rental of production space, communications equipment, transportation, and other maintenance-related expenses. Net capital investments are the capital costs for basic production assets renovation alone.

Here the reader should note that it is difficult to completely equate net capital investments with the investments for expanding production assets, or with the difference between gross and net capital costs to the investment for compensating the funds. The amortization fund can be used for expanding the basic production assets (under certain conditions). In addition, the resource-saving accumulation fund can contribute, to a certain extent, to a simple reconstruction of the basic production assets.

Experience in economic management demonstrates that the share of amortization in capital investments grows faster than net capital costs and accumulation in general. It follows that under the conditions of economic reforms and the growing influence of scientific and technological progress on reconstruction, the importance of amortization in capital investments, used for compensating and expanding the basic production assets, continuously increases. From 1980 to 1990, an average annual value of the basic production assets increased by 1.7 times, according to our calculations. This implies that the indicated value exceeds the growth rate of net capital investments and accumulation (by 1.1 and 1.34 times, respectively).

The indicated peculiarity in the resource-saving accumulation law offers one additional theoretical problem. There is no agreement about the role played by amortization in the extended reconstruction increase, the renovation of basic production assets, and the sources of accumulation. Some researchers assert that amortization does not play an independent role in accumulating basic production

funds, because an increase in amortization charges directly reduces the net profits of society, realized in a product's price, and reduces the accumulation possibilities. Thus, they state that worn-out basic assets are continuously replaced at the expense of the amortization fund. Only if "the latter exceeds the sum of discard of the basic assets in the whole national economy, can this excess be used for extended reconstruction of the basic assets and be considered as a source of accumulation. With current rates of scientific and technological progress and obsolescence of equipment, this situation can hardly arise." [9]

Data on capitalist production were used to show that amortization can be used for accumulation . In Theories of Surplus Value, Marx wrote: "I state that amortization fund, i.e. the fund for compensating wear of the main capital, is, at the same time, the fund for accumulation." [10] Marx saw amortization as a means of accumulation and not as a source of accumulation. Hence, amortization must serve not as a source of accumulation, but as a special economic form of the extended reconstruction of basic production assets. In this case, the source of the extended reconstruction is the compensation fund, accumulated by the society in monetary form. Moreover, the possibility of accumulating amortization fund in monetary form is determined by a specific process of natural compensation of a use value of the basic production assets, unlike compensation for the used-up part of their cost. (Calculations by F. Engels illustrated how a factory owner could use the amortization fund to increase the number of his machines by almost 60% without spending a penny of his own profit on buying machines. [11]) This is of fundamental importance under the conditions of the transition to market conditions, since the only source of resource-saving accumulation at the current stage of economic development remains surplus product (net profit).

The amortization fund becomes an accumulation fund in the form of free basic production assets and monetary means, which can be used for financing capital investments, in accordance with extensive or intensive extended reconstruction. With extensive reconstruction, the amortization fund is directed to a physical increment of the basic production assets of the former productivity. With intensive reconstruction, amortization is used to modernize the operating basic production assets, raising output by increasing productivity.

We should also be aware of the functions of accumulation which are performed by compensation and by amortization. The function of the resource-saving accumulation of the compensation fund follows from a simple reconstruction (the accumulation of a part of the amortization fund into

accumulation is not taken into account). This is connected to the improvement of the production properties of the basic production assets, which are put into operation in place of the discarded assets. The function performed by the amortization fund as an accumulation fund provides for an extended reconstruction of the basic funds.

When the economic mechanism determining the different forms of property is improved, an efficient use of the basic production assets creates the objective possibilities for using the amortization fund means for resource-saving accumulation. Providing for a balanced structure of amortization charges for compensation and extended reconstruction of basic production assets and sound ratios for using the amortization fund for capital repairs and renovations allows the economy to apply scientific and technological innovations.

The importance of the amortization fund as a source of extended reconstruction is growing. The fund has grown, as has the possibility of linking the fund to resource-saving accumulation. In the future, the absolute value of the amortization fund will grow continuously with the basic production assets, due to an increase in the share of the active part with a shorter service life and, hence, with a higher amortization norm. This is determined by the acceleration of scientific and technological progress and the reduction of the periods of obsolescence of machines and equipment. From 1980 to 1990, the total sum of amortization charges in the national economy of the Soviet Union increased from 73 billion rubles to 143 billion rubles, i.e. almost it doubled. This is explained not only by an increase in the volume of the basic production assets, but also by revaluation according to the restoration cost and the introduction of upgraded norms of amortization charges. In addition, a share of the amortization fund assigned to basic assets renovation was increased. For example, nationwide, the growth rate of the amortization fund that was assigned to renovation was too low. At the same time, the funds assigned to capital repair increased considerably (in fact, they more than tripled), from 14.6 to 54.5 billion rubles.

A comparatively fast rate of amortization, which is intended for renovation and directed to capital repairs, is a regular feature of the resource-saving accumulation process in the reconstruction increase. It is determined by the need for a more complete and accelerated utilization of STP in the development and modernization of the economy and the renovation of production machinery. This reflects the increasing role of reconstruction and technical re-equipment in operating enterprises.

For these purposes, in the period of 1986-1990 state capital investments

increased by 1.4 times and Kazakhstan capital investments by 1.2 times. This has had a positive effect on the structure of the basic production assets being put into operation. As a result, new, more efficient equipment will be introduced at the enterprises. This will save material resources and labor, improve production processes, and increase output per unit of equipment and meter of production area.

In light of this, further growth of social production efficiency requires the correct use of economic laws, especially accumulation law, under resource-saving conditions. The extended reconstruction of basic assets is the first concern. Implementation is an important factor for STP acceleration and increased economic development.

CHAPTER V
OPTIMIZATION OF ACCUMULATION

A major factor in the efficiency of economic resource-saving development, especially in market conditions, is the amount of accumulation assigned for reconstruction increase. Accumulation is largely responsible for socioeconomic growth and, therefore, the issue of optimum accumulation is reflected in the ratio between consumption and accumulation. This criterion is revealed in the process of resource-saving accumulation and introduces the possibility of increasing public wealth. In other words, with a new quality of extended reconstruction, rates are one of the most important parameters of the accumulation law in the conditions of resource-saving development. Here accumulation optimum appears if a maximum physical volume of the national income is attained, which reflects a qualitative economic growth with minimum overall expenses for social production. Hence, there must be a minimal norm of an optimum value of the resource-saving accumulation with maximum rates of socioeconomic growth. The problem of the mechanism of accumulation influence on the economic growth formation arises in this connection.

Accumulation is a continuous process. It is the most important progressive function of society, and is the basis for social, political, and intellectual progress. The dynamics, efficiency and amount of accumulation create the material conditions to radically improve the production and nonproduction spheres. Therefore, these are the most important parameters of reconstruction. This is illustrated by the following data. From 1970 to 1990, accumulation increased in actual prices from 84.2 to 150.3 billion rubles. During this period,

certain structural changes were outlined for accumulation. A share of basic production assets increment fell in actual prices from 45.5 to 38.2 billion rubles. A share of increment of material circulating assets and reserves increased by 1.8 times, with a total worth of 75 billion rubles. A share of material production accounted for 38 billion rubles in the basic assets increment, which totaled 80 billion rubles by 1990.

In connection with this, there is increased importance to structurally dividing the total accumulation into a productive purpose fund and a nonproductive purpose fund. It therefore becomes necessary to divide the overall accumulation fund into (a) means of production for developing the material base of both spheres, and (b) consumer goods for public and personal needs.

Resource-saving accumulation appears both in costs and materials, reflecting the development of market relations. The process of real accumulation, however, does not take place at all stages of the extended reconstruction. It proceeds only in the material production sphere with an efficient use of the labor force and means of production. An overall public product consisting of the national income, including the accumulation fund in the form of annual production increments, is created. Consequently, interdependence between accumulation and economic growth increases.

Some economists believe that the growth rates of production are determined mainly by accumulation efficiency, and its norm is insignificant. Other economists posit that the accumulation norm determines the growth rates of production. Another opinion is that an increase or even stabilization in the accumulation norm inevitably causes a reduction in the national income increment, because resources dwindle, construction is prolonged, etc. [12]

Indeed, from 1970 to 1980 the growth rates of accumulation and efficiency fell, which adversely affected economic development, with rates dropping to the level of economic stagnation. The gap between Kazakhstan and the most developed countries began to widen in the areas of productivity, product quality, and scientific and technological development. During 1970 to 1980, the dynamics of compensation (the spent means of production and its share in the gross public product) became worse and the rates of increment and productivity of labor in material production fell. The basic production assets of the national economy have almost trebled, capital productivity has fallen, and the growth rates of production capital per worker considerably exceed productivity. The accumulation process is expensive and it did not yield an adequate productivity increment and or save a great deal of labor. As a result, the growth rates of the

national income decreased: in 1980 its volume (used for accumulation and consumption) increased by 163% as compared to 1970; in 1990 it increased by 155% as compared to 1980; and during the five years of 1986 to 1990 it increased by 109%.

Negative trends can be overcome upon optimization of resource-saving accumulation, which functionally assumes a continuous growth of shares of more efficient means of labor in material resources. We believe that improving the technical structure of production and the dynamics of its organic structure, with increasing accumulation, can serve as a criterion of intensive resource-saving reconstruction. This means that a production increment is formed through applying radically new technology and more qualified labor. This intensive reconstruction is followed by a savings of resources, materials and labor, and accumulation resources at the expense of efficiency. New means of production can also be accumulated, but if they are not rationally used, this process is not intensive.

When we analyze the influence of resource-saving accumulation on the formation of economic growth, we must underscore the dependence of national income growth on the optimum value of accumulation. Over the last 25 years, we have seen that the rational share of accumulation has a considerable effect on the rate of economic growth worldwide (Table 11).

Table 11

Influence of resource-saving accumulation on economic growth in developed capitalist countries, % Index

	USA	FRG	Japan
Average-annual production increment	1.2	3.4	5.9
Investment share in equipment and building	16.6	20.6	28.4

The given data demonstrate that the rates of economic growth are dependent on accumulation and the efficient thereof. A share of production accumulation in the total volume of investments in the United States is half as much as in Japan. As a result, industrial production in Japan has developed 5 times faster than in the United States.

Analysis shows that generally the norms of resource-saving accumulation and growth rates of public product production are interdependent. This is because there are the same sources for the growth of the physical volume of the gross product and for changes in the accumulation norm. The new quality of economic growth and the rates of extended production of an overall public product determine the possibilities of increasing the accumulation norm, if this is necessary and expedient. The growth of the accumulation norm creates conditions for production development in case the investments are used efficiently. However, it is necessary to critically estimate the interrelationship between accumulation and economic growth, as well as its certain one-sidedness: the value of production accumulation is a very important factor in economic development, but not the only variable. The growth rates of national income and resource-saving development are affected by other factors as well. A more rapid growth of productivity as compared with the production capital per labor, a considerable savings of material expenses, the efficient use of production capacities, and the reduction of the investment cycle are important elements.

Therefore, it is not enough to connect the growth rates of the economy only with the value of accumulation. For instance, a large part of the resource-saving accumulation is realized in the basic production assets, but factors such as the labor force and circulating material assets should be taken into account. The ratios between production factors and the efficient use of each (from the point of view of output increment at the expense of market mechanism efficiency) is as important as the basic assets increment. The indicated change in accumulation efficiency is due to the fact that a product increment is related only to the dynamics of the accumulation norm, and other important factors are not properly taken into account.

The consideration of the functional dependence of the rates of economic and social growth should not be limited by the value of accumulation. This would underestimate the production increase. An increase in resource-saving accumulation efficiency becomes increasingly important to the growth of production and, therefore, consumption. Its dependence on the factors related to current consumption increases. Accumulation and consumption are not opposed to one another, because this would mean that current and future consumption would not grow in tandem.

Under the conditions of economic reform, it is possible and necessary to vary the norm of resource-saving accumulation, starting with balancing and

optimizing the ratio of accumulation to consumption. This possibility results from the development of multiple forms of property for the means of production.

Maximum efficiency of social production and, hence, intensive economic growth (for example, of national income) can be achieved at a minimum value of the resource-saving accumulation. This, however, requires us to establish resource-saving accumulation norms. A rational value of accumulation requires an optimum ratio between separate components of the national income, i.e. accumulation and consumption. This ratio depends on the relationship of property in the means of production. Only the optimum resource-saving accumulation will allow the nation to progress and develop economically, pave the way for the maximum realization of the functions of market production, and provide for a combination of long-term and current interests in the framework of economic cooperation between sovereign states.

What is the standard practice for finding the optimum value of the resource-saving accumulation norm? Usually the possibility of finding the value of the accumulation norm is indicated. This is a general approach, and in our opinion, it requires more detailed information on material production growth, the level of capital intensiveness, and the development of the nonproduction sphere. Optimization of the accumulation-consumption ratio eliminates a unilateral approach. Thus, if preference is given to a maximum growth of the accumulation fund during the entire planned period, then consumption will sharply increase due to a reduction in the development rates of capital goods production in this period, which will cause a future reduction in the growth rate of consumption. Consequently, both extremes should be eliminated from the long-term accumulation. The accumulation consumption ratio should be based on optimization problems, which exclude maximizing and minimizing one fund of national income and assume their simultaneous interdependent growth.

In research projects, the optimization criterion of the extended reconstruction ratios is formulated as a maximum integral consumption fund and as the volume and structure of accumulation fund, which provide stable optimum rates for the production increase. [13] The given statement sums up the discussion in this field. We believe, however, that it must also specify resource-saving development with the transition to the market, and achieving the optimum accumulation.

An important starting point is the methodological statement that the ratio between the accumulated and consumed parts of national income is affected by the ratio between necessary and surplus labor. A change in the ratio of

consumption to accumulation in the national income in favor of consumption is possible only if the productive forces are well developed and productivity is high. Maximizing the national income may serve as a criterion for the optimum accumulation-consumption ratio. This is true if the national income structure corresponds to the tasks of continuous growth of welfare with optimum rates of economic and social development.

The factors that determine a sound ratio between accumulation and consumption include: the material structure of the gross social product and the development of the branches of divisions I and II; comparison of the cost of the consumed means of production and newly-created cost, and its distribution; justified rates of economic growth and an increase in the standard of living; real accumulation, which involves new systems for material and technical supplies, price formation, financing and crediting, etc.

Changing the growth rates of national income during the last ten years affected "the size of consumption fund 2.5-3 times more than reducing the specific weight of accumulation fund." [14] This is because society is not indifferent to the cost of attaining high growth rates of the national income. The statement that "accumulation expenses per unit increment of social productivity in a planned future period are not growing" has been scientifically substantiated. [15] Therefore we should not limit our concerns to productivity growth or savings of production assets.

To summarize, in determining the optimum accumulation-consumption ratio, we must proceed from the principal aim of extended reconstruction, which reflects the interests of society and the process of developing production, exchange, distribution, and consumption. Extended reconstruction schemes make it possible to determine the upper and lower boundaries of accumulation, and its optimum value lies within these limits. The upper limit of annual accumulation is production for this period, and the lower limit is determined by current productive and personal consumption. Accumulation can be presented as the difference between national income and consumption for the corresponding period.

Thus, we can determine the boundaries of the accumulation fund and accordingly, the consumption fund. In economic management practice, it is always necessary to ask whether it is preferable to increase accumulation and consumption continuously and equally, or to increase a share of accumulation or of consumption. This indicates a ratio that provides optimum increment rates for the national income. There is a rule for a change in the ratio between

accumulation and consumption funds. For instance, if production efficiency increases, a share of consumption in the national income usually increases, and vice versa. A reduction in production accumulation is possible up to a certain point, beyond which, as we have shown, the growth rate of production begins to slow down and, as a consequence, the growth rate of the standard of living decreases.

An optimum ratio of accumulation to consumption does not exclude an approach which considers the growth of per capita income. The people are the consumers of final products. They are interested in consumption and, hence, in accumulation. It follows that specific ratios between the most important parameters of resource-saving reconstruction depend on the natural migration of the population and corresponding variations in available manpower. Consumption must not only correspond to population growth, but must increase at a greater rate. Thus, we can use the lower demographic boundary of consumption to find the upper demographic boundary of accumulation and, therefore, a total norm of accumulation for a future period.

A number of scientists suggest that we use mathematical models to optimize an accumulation share in national income. In the proposed one-product and one-factor models, a certain value of the adopted coefficients is applied in order to investigate the problem of optimizing the macrostructure of reconstruction during the whole calculated period. [16] In their calculations, other investigators vary the accumulation norm and growth rates of national income, as well as the demographic limit of reduction of accumulation norm. [17] Numerical models constructed on these prerequisites tie a population growth to national income as a whole, rather than to the consumption fund. In some scientific papers, the accumulation-consumption model is based on methodology, taking into account the national income growth, caused by an increase in the operating production machinery, as well as a lag in investments. This is an extreme example of employing mathematical methods to find an objective function. [18] In that case, the amount of investments do not depend on population dynamics and the growth of real income.

Some scientists suggest establishing an optimum ratio for distributing national income, which would take demographic factors into account. [19] Another suggestion is to find an equilibrium accumulation norm, which would provide a balance between factors, lags, and branches in the national economy. The first approach starts from the consumption growth per one worker; the second from an iteration of variants of analytical solutions to the problem. In our

opinion, introducing the accumulation-consumption model for determining the cost of work places is not optimum. In addition, particular features of intensification of the resource-saving reconstruction are not sufficiently considered.

Optimization of the ratio between accumulation and consumption on a macroeconomic scale expresses one of the most important mechanisms of resource-saving reconstruction. A scientific hypothesis of the economic growth of national income requires substantiation. The hypothesis can be developed proceeding from a probable number of workers of a material production and their productivity, or from basic production assets and indices of the efficiency of their utilization. Therefore, the production function is often used for predicting the dynamics and increment of national income, in accordance with the basic assets increment and the number of workers involved in material production. A simple extrapolation of the past to the future, however, is impossible. To start with the condition that the dynamics of the resource-saving accumulation level of the last period will remain unchanged during succeeding years deliberately distorts specified calculations. Therefore, prediction versions of accumulation optimization must be based on more reliable mathematical mechanisms and software.

As noted earlier, substantiating a consumption fund per capita is very important for the optimization of the ratio between accumulation and consumption. Consequently, a complex approach is required, which takes into account changes in reconstruction structure and the technical level of production (increasing the share of an active part, i.e. new machines, equipment, technologies), as well as the social re-orientation of the economy. This will rationalize consumption and accumulation and turn them into an additional resource-saving source.

There is a transition from multifactor (two- and three product) models to multifactor dynamic models, based on interbranch balance, expressing the optimization criteria for the consumption-accumulation ratio. A number of research projects present a thorough and complex analysis of the elaborated models and offer suggestions in this area. [20] For example, we can employ an economic and mathematical modelling of optimum ratios of consumption and accumulation, based on increments and discarding basic production assets. Soviet and foreign scientists have explored this approach in depth. [21]

Macroeconomic models, based on real economic mechanisms and dynamic indices, are sufficiently reliable tools for long-term planning and predicting the

reconstruction process under the conditions of STP and resource-saving development. The elegant results of the mathematical theory of economic dynamics usually oversimplify the description of real economic processes. As a result, the model is not realistic, which should be taken into account in developing interbranch and regional models of how resource-saving accumulation affects economic growth rates.

In this regard, works on the optimization of accumulation and economic growth deserve attention. Economists have developed a method for determining the dependence of economic growth on accumulation, for the following reasons. First, it presents a systematic approach to determining the dependence of the acceleration of economic growth rates (of national income) on the most important factors: productivity, production capital per worker, provision of basic assets, capital productivity and the capital intensiveness of the national income. In addition, it suggests a complex analysis of the optimization of the consumption-accumulation ratio to this level, which ensures economic efficiency of accumulation (investments) utilization for a maximum increase in national income, as the most important strategic condition for economic growth. [22]

The authors of this study have constructed dynamic models of the dependence of economic growth on accumulation, based on the criterion of maximizing the national income dynamics. The optimization of the consumption-accumulation structure and the efficient use of reconstruction factors are thereby predetermined. It is probable that the criterion for maximizing national income corresponds more closely to real economic processes. This approach to constructing retrospective mathematical-economic models and predictions up to the year 2000 demonstrated that in order to achieve the maximum possible national income (economic growth), considerable accumulations are required to intensify economic development. We believe, however, that the maximum national income will be attained at an optimum accumulation norm, providing resource-saving development. This requires a new investment policy, based on STP acceleration and a transition to market economic management.

At the same time, during the last fifteen years, a consumption share of the national income averaged only slightly above 73%. Recently, it rose somewhat, but when leading scientists discuss the concepts of social economic development for the distant future, many propose reducing the consumption share again. One figure they mention is 70%. Social re-orientation of the economy is almost impossible under such conditions.

The experience of many developed countries suggests that more than 80%

of national income can be allocated to consumption without sacrificing reconstruction. Kazakhstan also has this potential, especially as the consumption demands increase. Along with increasing the increment rates of the national income, we should revise its structure, raise the consumption share of national income considerably, to a minimum of 78-80%, with a simultaneous increase of expenses for social and cultural construction.

An optimum value of accumulation and resource-saving economic growth must be calculated with respect to the social re-orientation of accumulation. Redistributing resources from accumulation to consumption can be implemented only on the basis of growing production efficiency and improved use of investments. By sharply reducing accumulation today, tomorrow we may be faced with a decrease in the production of means of production, and a lower standard of living. In addition, this redistribution is possible only in very limited amounts.

Accumulation directly affects welfare growth. In fact, it includes an increment of the basic nonproduction assets, i.e. housing, hospitals, schools, etc. A reduction in consumption share is a very limited and short-term action for consumption growth. Most important is to increase the volume of national income, a part of which is the consumption fund.

A reduction in the consumption share will make it possible to profit from the production of consumer goods. Without creating a corresponding material and technical foundation via accumulation, this will be a temporary gain. The development of the investment branches is retarded with a decrease in the accumulation. This, in turn, reduces the absolute increments of national income and adversely affects the consumption fund increment. For instance, if a consumption fund share was 29% in 1966-1970, in 1976-1980 it had already been reduced to 27%, and in the second half of the eighties it was only 25%. The reduction was due basically to an accumulation share in the basic production assets. Absolute increments of the accumulation have shrunk, which caused a reduction in the absolute increment of the national income. This is explained by the fact that under specific conditions in the 1970s and 1980s, a reduction of the consumption fund share in the national income was not adequately compensated by increasing production, which would act to raise the national income and, respectively, the consumption.

Consumption and accumulation thus require growth. An increasing social load on re-orientation of accumulation use should also be taken into account. Greater salary increases, with differentiation according to results, is also

necessary and requires a corresponding increase in the production of consumer goods and services. This concept cannot be realized without an adequate increase in growth rates of national income.

Hence, a reduction in the norm of resource-saving accumulation cannot be considered as a condition for intensive development, and an increase in this norm as a condition for extensive development. The central question here is not increasing or decreasing the accumulation share, but whether or not the share reduction is associated with increased acceleration. If not, then this process will inevitably slow down economic growth, since it will be based on insufficient growth of the technical level of production. The accumulation share reduction reflects intensification processes only if it is organically connected to a growth in production efficiency based on STP acceleration.

Social re-orientation in using the resource-saving accumulation was initially reflected in the optimization of the component parts of the national income. Now it is a factor in determining investment policy. Investments have consistently constituted a high share of the gross national income in the economy of the former Soviet Union, approximately 28.6% as compared to 17.2% in the United States and 19.3 % in Western Europe. Investment policy, however, requires essential changes. How these changes will impact upon the economy must be taken into account when determining the norm of optimum value of the resource-saving accumulation. Planners must focus on efficiency and increasing production. Their emphasis should be on final results, rather than on intermediate ones; on renovation, rather than on the extension of production assets; on a radical improvement of the utilization of material resources, rather than on increasing the resources. Other important areas include the development of the nonproduction sphere and raising the standard of living.

Maintaining a high level of investment resource-saving activity is fundamentally important to efficient economic policy. Large capital outlays are necessary to develop the material and technical base of nonproduction branches, and for housing construction. The branches that apply STP achievements desperately require new construction. Certain capital investments are needed to balance the development of associated industries, including ferrous metallurgy, machine-building, building materials and construction. There is an increase in the volume and share of capital costs for discarding basic assets. This is due to accelerated renovation of production machinery.

Analysis of economic development demonstrates that the growth rates of national income increase with production capital investments, performed in

resource-saving form. These rates decrease with a reduction in the growth of costs and their scientific and technical level. We cannot state that an increase in the efficiency of capital investments can compensate indefinitely for a growth rate reduction. This is possible to a certain extent, but large investment resources are required to quickly implement the modern technological transformations and to develop resource-saving production in different branches. Experience shows that as the growth rates of capital costs are reduced, the indices of their efficiency also fall. Insufficient investment resources leads to a gradual increase in the technical level of production and resource-saving, and the corresponding retardation of the economic development dynamics. Therefore, a systematic and stable savings of investment resources creates the necessary material conditions for the structural rearrangement of social production and its qualitative transformation, with the aim of further socioeconomic development.

A norm of optimum value of resource-saving accumulation must also reflect a social re-orientation in the new investment policy. A share of nonproduction investments should be increased in the total accumulation norm. For example, capital investments of nonproduction building has begun to exceed the growth of production investments. Investments to the social and cultural sphere increased from 41.6 billion rubles in 1985 to 64 billion rubles in 1990. On the whole, an increase in the social orientation of resource-saving accumulation is caused by the necessity to raise the production volumes, consumption fund, and real per capita income. This requires an increase in accumulation efficiency, production growth, and technical re-equipment. On this basis, it is possible to attain an accelerated increase in national income and a new quality of economic and social development.

In order to form an optimum value of the resource-saving accumulation, we must also find available savings, which may be quite important in realizing accumulation. Thus, a reduction of material input per unit of production is of paramount importance in resource-saving. According to interbranch balances of the former Soviet Union, a specific share of material production investments in the gross social product cost, expressed in real prices (without amortization charges), amounts to approximately 50%, and in industrial products, to 68%. Reducing these expenses would have a great impact on the national economy. Reducing material expenses by only a kopek per each ruble of the overall social product would produce an additional 14 billion rubles of national income. This would reduce the need to accumulate circulating assets and create conditions for increasing accumulation efficiency and the consumption fund. As a result, social

functions of resource-saving accumulation would be considerably enhanced. Substantiating the norm of resource saving accumulation requires an estimate of the efficiency of this process (Table 12).

Table 12

*Accumulation efficiency**

Periods, years	National income increment, bil. rubles	Accumulation fund bil. rubles	Effectiveness ratio of accimulation
1971-1975	417	456	0.91
1976-1980	398	534	0.75
1981-1985	353	603	0.59
1986-1990	530	800	0.66

* Calculated from the following materials: *National Economy of the USSR During A Seventy-Year Period*, (Moscow: Financy i statistika, 1987) [Russian], *Statistical Almanac of the National Economy of the USSR for 1990*, (Moscow: Financy i statistika, 1992) [Russian], and the author's data.

Table 12 illustrates that the increment of the physical volume of national income fell during the last 15 years, due to accumulation. The analysis demonstrates a continuous growth of accumulation per 1 ruble of increment of the national income from 1.84 basic points in 1970 to 4.47 points (on average) by the beginning of the twelfth five-year plan, and reduction of increment of the national income per 1 ruble of accumulation during this period, from 0.54 to 0.32 points (on average). It should be noted that the increment of national income does not depend solely on accumulation. It is also connected to the number of workers occupied in production, productivity growth due to better organization of labor, etc. Investment lag should also be taken into account, since an increment in the national income was accumulated not only during the estimated year, but during the previous years as well.

The data given in Table 12 characterize the efficiency of use of the entire accumulation package. This must, however, be divided into production and

nonproduction segments. It is important to remember that material costs for payments to the workers must not be reduced to their combined expression. If the gross product is accounted for by the factory method, material costs contain a repeated count of the same quantities. A part of the surplus products intended for science, management, etc. should not be eliminated from the costs. In addition, the costs must contain all the utilized basic assets, not only the consumed ones. On this basis, we can imagine a model which compares national income to the whole sum of current expenses.

This suggestion, which identifies a set of problems, appears to be a more complete reflection of economic practice. Using this as a foundation, we must pay careful attention to the time factor when we calculate amortization. If our calculations are based on the whole period rather than on one year, the current expenses must be considered without amortization for a complete restoration (renovation). Otherwise the current expenses for amortization will be duplicated with capital costs.

Undoubtedly, it is necessary to construct the norm of the resource-saving accumulation in terms of functional purpose. From a practical point of view, the dynamics of the effectiveness ratio of productive accumulation (the ratio of the national income increment to the productive accumulation) is characterized by the following data (Table 13).

Table 13

*Use of productive accumulation in the USSR**

Index (on average per annum. in real prices)	1971-1975	1976-1980	1981-1985	1986-1990
Annual increment of national income, used for consumption and accumulation, billion rubles	15.5	18.2	22.9	20.8
Total accumulation, billion rubles	91	108	138	148

* Calculated from the following materials: *National Economy of the USSR During A Seventy-Year Period*, Moscow: Financy i statistika, 1987) [Russian], *Statistical Almanac of the National Economy of the USSR for 1990*, (Moscow: Financy i statistika, 1991) [Russian], and *Statistical Herald*, No. 1 (1988).

Table 13 (continuation)

Index (on average per annum. in real prices)	1971-1975	1976-1980	1981-1985	1986-1990
Productive accumulation, billion rubles	71	86	110	108
Effectiveness ratio for total accumulation	0.170	0.168	0.166	0.141
productive accumulation	0.215	0.212	0.208	0.192

Table 13 illustrates the dynamics of the level of productive accumulation efficiency. The national income increment per 1 ruble of the total accumulation equalled 17 kopeks in the ninth five-year plan and 19 kopeks in the tenth five-year plan. In 1971-1975, 21.5 kopeks were obtained, and in 1976-1980 slightly over 21.1 kopeks were obtained. Thus, the effectiveness ratio of the productive accumulation was higher than the effectiveness ratio of the total accumulation . The indicated dynamics of the accumulation process efficiency during 1971-1990 cannot be considered regular, even considering objective difficulties (bad harvests and other reasons).

Calculations also demonstrate that during from 1971 to 1990 the accumulation share in the national income increased for each percent of its increment: 3.75% in 1971-1975, 4.82% in 1976-1980, 5.98% in 1981-1985, and 7.28% in 1986-1990. These dynamics reflect negative features, which reduce the productive accumulation efficiency. The dynamics of national income must prevail over accumulation increment. This is the most important condition of resource-saving reconstruction.

Increasing the efficiency of accumulation is obviously the most important source of resource-saving. When we determine the corresponding norms, it is fundamentally important to take into account the human factor. In all probability, there is no direct functional connection between the growth of productive accumulation and the dynamics of social productivity. They have a correlative connection and the closeness of this connection depends on a number of circumstances. It is therefore incorrect to posit a direct relationship between accumulation growth and productivity enhancement. Faster growth of productivity, as compared to the production capital per worker, affects the

dynamics of the productive accumulation norm. It also makes it possible to allocate more resources for consumption and nonproductive accumulation.

Thus, in order to formulate a concept of the optimum value of the resource-saving accumulation norm, we must examine and analyze a wide range of problems, caused by radical reforms in our country. We must arrive at the optimum consumption-accumulation ratio, which is one of Kazakhstan's most acute structural problems. Other major factors include the efficiency of the accumulation for resource-saving reconstruction and the achievement of the best growth rates of national income under the new conditions of economic management and market relations.

CHAPTER VI
INVESTMENT POLICY UNDER MARKET CONDITIONS OF ECONOMIC MANAGEMENT

Resource-saving reconstruction with the best materialization of investments can be provided by a qualitatively new investment policy during the transition to a market economy. This policy must take into account the historical experience of Kazakhstan's economic development, new potentialities induced by the growing scientific and creative potential, and the democratization of social life in Kazakhstan. The principal feature of the new model of social and economic development is reconstruction increase based on STP and resource-saving.

Our mission is to completely set in motion the economic potential of Kazakhstan and direct it to people's needs. Kazakhstan now possesses unique natural resources, as well as considerable production and intellectual potential. Almost 20% of coke and power-generating coal is mined here, and the republic produces more than 90% of yellow phosphorus and 40% of fodder phosphates. Almost 97% of all reserves of chromite ores are found in Kazakhstan. The national wealth of the republic exceeds 200 billion rubles. Industrial production amounts to 34 billion rubles and agricultural production to 30 billion rubles. About 700 people per 1000 have secondary and higher education. There are about 7 million workers, employees, farmers, and cooperative workers in Kazakhstan.

During the last five years, the increment of industrial and agricultural production, real income, and paid services were among the highest. The general investments of the republic grew considerably, especially in the nonproduction

sphere. The increment of consumer goods was approximately twice as high as in the previous five years. Positive features of the investment policy include the growth of capital investments concentration in building, the accelerated development of the building-material industry, and an increase in the number of small building organizations. This is important because Kazakhstan covers a huge territory.

At the same time, the general level, development rates and quality lag considerably behind demand, available possibilities, and world trends. During the period known as "Rearrangement," there were no essential changes in the economy. On the contrary, almost all aspects of the economy have been depressed. According to many basic indices of well-being, Kazakhstan is below average among the countries of the former Soviet Union. For instance, a volume of services per one citizen is 1.45 times less than the average, and unsatisfied demand of the population exceeds 3 billion rubles. The growth rates of social production and the quality of many types of products are falling behind. Only 2-3% of equipment meets world standards, while specific consumption of materials and energy are approximately, 2-3 times higher than world indices.

The indicated factors and others result from commanding administrative methods of management, and in particular from drawbacks in investment and innovation policy. Reconstruction without due regard for scientific and technical advances and the dissipation of investments were obvious errors of the investment policy. In Kazakhstan only 0.2% of the national income was allocated to science, as compared to 6.6% on average in the Soviet Union. A share of investments in technical re-equipment is about 35%, as compared to 55% which is generally considered the optimum. Many new projects are not progressive (unfinished building amounts to 90%). A share of profit increment through STP was only about 4% in 1990. Investments are often oriented to the intermediate product and not the final one. The bulk of capital investments in industry was assigned, as before, to the development of the mining industries. This does not provide a qualitative improvement of the structure and use of capital investments.

At the same time, an increase in the growth rates of capital investments by 1.5 times during 1986-1990 was due to an increase in the importance of the innovation fund in financing investments. At the expense of this factor, the investments in the production sphere and social and cultural building considerably accelerated upon an almost constant level of extended reconstruction of basic assets in the national income. As a result of the extended

independence of the enterprises, the volumes of investments were, on average, 60% of the total volume of renovation fund during the last five years, and exceeded it in 1990.

No essential rearrangement of the branch structure of capital investments has taken place in industry. A share of expenses for machine-building and light industrial development has been reduced, with an ever-increasing share of the fuel industries. A growth of the specific weight of mining industry costs was determined by the scale of development of the oil and gas branches. A reduction of machine-building and light industry costs resulted from insufficient growth of resources allocated to these aims from the accumulation fund at the expense of renovations. Due to a low amortization norm, it is difficult to increase the volume of investments.

The results of the 1980-1990 period demonstrate that the indices of the technological and reconstruction structure of capital investments improve very slowly. During the last five years, a certain reduction in civil and structural costs was observed only in industry and agriculture. In industry, it increased in all branches except nonferrous metallurgy, machine-building, and branches of Group B. Consequently, a reduction of the civil and structural work share in industry on the whole will be provided mainly by structural changes (through a reduction of power engineering and metallurgy in capital investments, as well as growth of the fuel industry share, which has a lower specific weight in civil and structural work).

That is why during the current five-year plan the share of production capital investments in building has increased. The share of new buildings in electric power engineering (72%) and the fuel industry (71%) is high. The share of costs for technical re-equipment and modernization has fallen as compared to 1985 in the fuel industry (from 32 to 22%), nonferrous metallurgy (from 66 to 27%), machine-building (from 43 to 36%), the building materials industry (from 38 to 30), and light industry and food industries (from 60 to 55.2 and 54.4%, respectively).

Insufficient production capacities were brought into operation. Only a third of planned capacities were introduced in electric power engineering, a half in the coking by-product industry, and 60% in metallurgical machine-building. The period of time required for projects in other branches is great as before, and the estimated unit cost for newly introduced capacities is growing. Evaluating the movement of budget prices over capital investments, we see that they increased not more than 1.2-1.3 times. Consequently, the basic reason for the raise in

price for a unit of capacities comes from the building industry.

The investment process takes many independent directions and there is no contact between the participants. The investment economic mechanism is not focused on superior final results. One example of this is the construction sector. Multi-departmentalism is a principal reason for the inefficiency of organizations. More than 50 different ministries and departments are involved in construction in the republic, with over 1.2 thousand subordinate organizations. Although 37% of all builders and a considerable share of basic assets belong to them, they perform only about 13-14% of the total volume of contract work. Departmental divisions and the inefficient management of construction and construction industry enterprises result in low profitability.

The construction potentialities are impeded by the absence of an economic mechanism which would make it possible to activate capacities, projects, and basic assets in time. The existing mechanism does not exert a strong influence on the building materials and construction industries. The utilization ratio of operating capacities at the enterprises ranges from 83 to 50 for different kinds of production, and has fallen in many areas. Capital productivity has also fallen (with the growth of production capital per worker) from 105 to 73 kopeks for the construction and prefab industry. In Kazakhstan, these industries now amount to 1 million rubles. Traditional civil and construction work (to say nothing about new types of projects) was 10-20% below the average in the Soviet Union. Prefab construction was 7% below average.

A large part of construction equipment in Kazakhstan is antiquated, and more than 50% is at least 15 years old. For many years, the majority of capital investments were directed to new construction with an outdated technical base. As a result, outdated funds have accumulated. At building enterprises, 2% of the basic production assets are discarded, as compared to the 4-5% that are necessary for normal operation.

A number of building materials are in short supply, including nonmetallic, heat-insulating, and decorative materials, and some sanitary-ware. A share of gravel and crushed rock accounts for 20-25% instead of 45-50%, hollow brick accounts for 15% instead of 30-35%, and cellular concrete and concrete that contains manufactured porous aggregates for only 10% instead of 40-45%.

The production of structural building materials, decorative materials and hygiene equipment are not in the correct proportion. The output of effective decorative materials does not satisfy modern industrial construction. Therefore, labor input into decoration and post-frame work is 3-5 times higher than in

erecting the frame. On the whole, the rate of development of the building materials industry does not correspond to the rate of increase of civil and construction work and calculations show a 10% lag. The volumes of production and demand for import and export of building materials and construction are illustrative (Table 14).

Investment policy and experience do not have appropriate guidelines for the national, regional, or enterprise-wide levels, which systematically set out indices for technical re-equipment, modernization, efficiency, and the stages and terms of implementation. In 1990, capital productivity fell by 3 points with the growth in specific consumption of materials and a certain reduction in energy and metal consumption. A low technological level created poor working conditions and is the reason that more than 20 towns have become ecological disaster areas.

Table 14

Indices of production and demand for import and export of basic types of building materials and construction in Kazakhstan, 1990

Materials and constructions	Production	Demand	Excess(+) Deficit(-)	Import	Export
Cement, thous. t	8700	9500	-800	1017	1366
Porous aggregate, thous. m3	2600	3900	-1300	-	-
Building blocks, million pieces	4000	4800	-800	263	-
Asbestos, thous. t	500	400	+100	-	-
Structural glass, million m2	-	20	-20	-	-
Building ceramics, thousand m2	3000	4177	-1177	-	-
Gypsum, thous. t	170	435	-265	-	-
Polymeric materials, million m2	4.0	16	-12	-	-
Decorative materials, thous. m2	1000	863	+137	-	-

Tabke 14 (continuation)

Materials and constructions	Production	Demand	Excess(+) Deficit(-)	Import	Export
Asbestos-cement pipes, km nom. diam.	7700	7000	+700	-	2200
Construction lime, thousand t	400	797	-397	-	-
Hygiene equip-ment, thousand pieces	480	935	-455	-	-
Built-up ferro-concrete constructions, thous. m3	7900	8500	-700	650	400
Steel constructions, thousand t	190 10	250	-60	15	
Millwork, thousand m2	2400	4000	-1600	600	-
Glued wooden constructions, thousand m3	16	30	-14	-	-

Note: Deficient materials and constructions are replaced by other low-efficiency materials

The machine-building share in Kazakhstan accounts for only 17%, as compared to an average of 28% in the countries of the former Soviet Union. Only 14% of the republic's budget is a result of payments received from profits of state enterprises. Fixed prices for ore resources, high taxes on profits, and the concentration of currency income in central departments create additional difficulties for economic growth.

In the years 1991-1995, the republic will introduce a program of economic modernization, and implement major changes in production, with attention to consumer demand and market relations. This program calls for reducing capital investments in the mining and ore-processing industries (now 85%), increasing

capital investments in the social sphere from 28 to 34%, and increasing investments in consumer goods production by 3.4 times (with the growth of general production investments by 125%). In addition, investments in the processing branches of the agro-industrial complex by will be increased by 1.5 times, as will investments in building materials production and light industry. This must be supported by a certain increase in the machine-building share and the branches that determine STP. According to estimates, during the forthcoming five-year plan, the share of industry, building, and priority branches will increase.

Using pre-planned developments in Kazakhstan and the model of national income growth, we can determine growth by approximately 17 billion rubles. Here the accumulation norm may decrease from 29-30% to 21%. According to the developments available in the republic, by 1995 the gross social product will increase by 1.24 times, national income by 1.27 times, and social labor productivity by 1.25 times, with reductions in material, metal, and energy consumption. The growth of public consumption funds will amount to 40% with a 30% increase in the output of Group B products (24% for Group A). The supply of commodities increased from 80% to almost 90%. Nonfoods production (excluding light industry) per capita almost doubled in comparison to 1990.

This characterizes the prospects for economic development in Kazakhstan. After an analysis of the possibilities for the national economy and new trends of social progress, Kazakhstan must put an end to depression trends and implement the methods for developing productive forces that will be most advantageous. Moreover, the economic mechanism must turn STP into a decisive factor for resource-saving production development and provide a technological breakthrough in the 1990s.

The foregoing demonstrates that the basic priorities of the new investment policy are:

: **Methodology** - the orientation of all levels of the economy to achieve maximum efficiency at enterprises, in regions, and nation-wide.

: **Investment utilization** - finding and realizing the most advantageous variants by using scientific developments, changing forms of property, and controlling market relations.

: **Technical re-equipment** - introduction of advanced technical and technological systems in industry, in particular the deep processing of ore and accumulated waste in consumer goods production.

: **Motivation and sanctions** - creation of a scientific system to reward achievements or control damage, starting with the development of market relations, which lasts for the entire process of extended reconstruction.

The strategic aims of this new investment policy are the best realization of social values and the implementation of the conditions for the most efficient variants of socioeconomic development at all the stages of the transition to market relations.

In order to end the economic depression, stabilize the economy and institute market relations, we must determine a system of factors for the accelerated creation of the high quality basic production assets. Investment potential should be used for the social re-orientation of the national economy. Methodologically, we start from the fact that the most socially significant results are the determining factor in qualitative economic growth. This must be taken into account in selecting a scientific and deliberate approach to the formation of new investment policy under conditions of market structures. Here, scientific and technological achievements must best serve the people.

The reconstruction process needs to make a qualitative leap, due to the slow growth in intensive factors. This requires a radical change in the methodology of determining sources and resources of economic growth, establishing a scientific base for the corresponding investments for the planned transition to fund-saving avenues of production increase, the provision of qualitative structural dynamics of the economy of the republic and its regions, and a combined introduction of efficient resource-saving machinery and technology. For various reasons, the introduction mechanism is inefficient. Moreover, more than a third of capital investments in Kazakhstan industry compensate for a rise in the price of new machinery.

A new state and market mechanism for controlling the entire scientific production cycle is needed to overcome the increase in product capital intensiveness which is a by-product of more complicated and highly efficient techniques and the newest technological systems. The mechanism will operate at the expense of additional investments and material and labor input upon their optimization for the resource-saving development. The share of expenses for economic feasibility should be increased by 3-5 times in the total design calculations. The ratio between industrial engineers and economist-engineers should be reduced to 10:1 (at present it is 30:1). To improve the role of long-term and combined prediction, it is necessary to combine the processes increasing the science-intensiveness of production and optimize state and private

investments in R&D and STP achievements, so that price formation for a new machinery would promote interests of the producers and consumers by reflecting economic relations.

A relatively high level of investment activity (but in optimum limits) provides for the social re-orientation of the Kazakhstan economy, the development of the material base of the nonproduction sphere, construction engineering, and building the social and production infrastructure. A controlled and stable accumulation of investment resources depends on the accumulation level and its efficient materialization. This creates conditions for increasing the share of the national income earmarked for personal consumption and the growth of commodities production. This will lead to a qualitative change of the structure of the accumulation fund, the ratios between its production and nonproduction parts, and the balance of investment between production and nonproduction, between Divisions I and II of social production, and between Group A and B in industry.

As noted earlier, maximizing the national income may serve as a criterion for the accumulation-consumption ratio. Here the structure of the national income must correspond to the objective of permanently improving people's well-being and raising per capita income. A system of social factors must be reflected in a qualitatively new rationalization and use of the consumption fund structure.

There are contradictions in terms between accumulation and consumption, and they arise in the extended process of developing various forms of property. A comprehensive account of consumption can be realized in constructing optimization models of the accumulation-consumption ratio. These models eliminate maximizing and minimizing one of the components of national income and assume interdependent growth. The dynamics of the factors in the reconstruction increase (capital intensiveness, labor input, production capital per labor, and productivity) are associated with changes of "intensive" values of the national income of Kazakhstan, capital intensiveness, investment lag, and the coefficients of basic production assets renovation for the efficient use of investment resources of the republic and its regions.

The procedure of using variable standard coefficients for determining the type of production function makes it possible to consider links between the indices and to select the optimum value from the permissible values. In addition, the procedure enables us to take into account a time lag in models for intensifying the renovation of basic production assets and to justify combined coefficients, reflecting qualitative indices of economic development. One such index is the

coefficient of the interrelationship between indices of national income capital-intensiveness and the accumulation norm, which makes it possible, within the limits of the obtained optimum solution, to vary the levels of the accumulation norm according to resource-saving capital-intensiveness and vice versa. Third, with the help of simulation, the procedure enables us to analyze the system in light of real socioeconomic processes, both for the past two decades (1970-1990) and for the future (1991-2000).

Technological renovation of production of the enterprises is a very important problem which involves considerable difficulties in implementation. They can be solved if working teams will be interested in using the latest scientific and technical achievements, as well as instituting competition in market relations at all levels. Reliable guidelines for organizing production are required during the transition to a market economy. We still do not have an appropriate tool for selecting the criteria for determining the volumes and structure of the investments, which will be necessary for the optimum scientific and technical development of enterprises and territories.

The established approach to estimating machinery renovation according to distinct processes and indices does not account for a number of objective difficulties. First, specific investments in a specific region have a series of economic and social aims. With the general social trend, some meet intermediate goals and some are designed for long-range objectives. The aims can be both tactical and strategic, for instance to raise some branches or regions to the average republic-wide or world level, or to exceed these levels and thereby improve well-being. Naturally, limited resources motivate the team to look for the best combination of objectives.

In addition, it is difficult to select criteria because all investments only indicate the potential for better development. Here, again, it is necessary to look for a compromise of current and future well-being. This is especially true of investments in science and large industrial entities. Third, the solution of the problem is complicated by the established accounting of costs and effect. The investments are not simultaneous and are estimated differently during reconstruction. The effect is different in time and space, and are difficult to calculate, particularly in related branches.

This suggests that a weighed approach to renovation evaluation is required both in the context of an enterprise, branch or territory and for the national economy as a whole. In addition, it is necessary to implement the effects preferability and order of priority, established by manufacturers and customers

for different variants. For instance, in some cases obtaining material goods is more desirable than improving working conditions. In other cases, especially at plants which use dangerous chemicals, an improvement in working conditions is preferable. Variations depend on a series objective and subjective conditions. For example, Japan has a higher accumulation norm than does Kazakhstan, but owing to the intensity of using investments, there is an annual increment of real well-being of the society.

The scientific and managerial staff of an enterprise must select the criteria for determining the growth rate of investments in technical re-equipment and modernization. They must consider the general priorities of Kazakhstan's economic development in the 1990s and the republic's investment policy in the field of new construction. The established level and sources of accumulation, possibilities for efficiency growth of STP, and market demand should also be considered. These are the conditions for the specific calculations and the search for optimum structures. Thus, the priorities for distributing investments indicated above are oriented towards the growing efficiency of the entire economy, especially at the expense of developing new machinery, technology, and types of manpower. These are the general conditions for new construction and technical re-equipment of enterprises.

Under the conditions of the reform, the enterprises carry out and pay for technical re-equipment and modernization based on STP. The art of management involves stimulating the technical renovation of enterprises to approach actual national economic efficiency. What are the best methodologies and procedures for using investments in technical re-equipment and renovation at a new stage?

In the context of the greater social orientation of the economy, we must estimate more thoroughly specific consumer values attained through STP. Making goods and providing creative work are important strategic parameters of social orientation, involving both working conditions and ecology. This solution must be efficient and advantageous for the team and the country as a whole. The methods for selecting complex economic and social criteria must be used here to decide on future development.

The way to implement a combined approach is to search for and utilize reserves of enterprises and regions, on the basis of comparing alternative suggestions. The enterprises may be competitive for technical re-equipment on the basis of "Methodical Recommendations for Estimating the Efficiency of Measures for Accelerating Scientific and Technical Progress," approved by a decree of the State Committee of the Soviet Union for Science and Technology

and the Presidium of the Academy of Sciences of the Soviet Union, as well as provisional methodical recommendations for branches which were developed in 1990. These documents suggest a certain tool for estimating the economic efficiency of scientific and technical measures, the best of which should be used in the development plans for enterprises and territories. The proposals and reports should reflect the indices of economically independent enterprises. The recommendations should be taken into account in setting prices and used for material incentives.

The principal criterion for selecting a variant is the greatest excess of a cost estimation of results over a cost estimation of joint (one-time and current) costs during the whole period of STP implementation with regard to the time factor. In the context of the national economic approach, some propose an analysis of all positive and negative results (including social and ecological factors) for the entire cycle, with regard to unequal costs and results. It is recommended to set prices on products of a separate enterprise on the basis of the cumulative effect of the results of the product utilization.

In this respect, theoretical developments based on V. V. Novozhilov's methodology, [23] which make it possible to factor in the market-induced motion of cost indices, are very important. Economic demand for renovation grows with the introduction of advanced and more capital-intensive equipment.

This principle for calculating the volume of investments in technical re-equipment is oriented to optimization within the production limits of the given products. It takes into account several versions and possible losses for the national economy and the enterprises during renovation of the basic production assets on the basis of science and technology, which is very important for future investment policy.

This approach works well within the determined boundaries, but can also be widely applied, because when the necessary range of products is attained, iteration of variants with new investments, with a growing scientific production force is possible in all branches. Its drawbacks are significant and are associated with the absence of external competition, a flexible price mechanism, a complete account of social factors, and so on. Therefore, a directed socioeconomic analysis and an accounting of terms are required. In particular, during price formation according to average production costs, we cannot be limited by self-supporting interests of the enterprise when selecting technical re-equipment policy.

Efficiency and technical re-equipment rates go up when more investments

are used within their optimum volume, which takes into account the degree of wear of the available assets. This criterion becomes more significant when the transforming possibilities of science and technology are greater. Therefore, scientific analysis and the market mechanism, including the banking system, provide the greatest socioeconomic effect of the technical renovation of production potential.

When selecting alternatives of technical renovation, we should use the most stable characteristics of the replaceable assets as basic indices. If the economic effects of the variants are identical, the variant for which a combination of other needs is realized is considered the best. A number of formulas are suggested in the procedures, including formulas for reducing non-simultaneous costs, for estimating ecological damage, etc. According to estimates, variants of technical renovation, which are not associated with large investments in less productive funds, must have a coefficient in the range of 0.2-0.3. At the same time, we cannot be satisfied with the norm as a progressively average efficiency, since it reflects significant capital construction drawbacks. Here we must consider the fact that the deficiencies of the current tools make it impossible to use the indicated procedures to predict the volume and structure of future investments, corresponding to the growing rates of machinery renovation. The drawbacks also underestimate market relations, and this can introduce rigid corrections into all the calculations, based on norms and expert estimates.

Resource-saving development requires elaboration of a new investment strategy upon the transition to a market economy, extending investment cooperation between the countries of the former Soviet Union, and entrance into the world market. Practical implementation of capital investments occurs during the operation of the investment complex branches that create funds. Its composition and the directed orientation of the production, however, are not yet reflected in theory and practice. Here we should proceed from a more complete account of the social division of labor in the course of renovation of the basic assets. The assets must be created not only by the design, industrial and construction divisions, but also by the investment machine-building branches.

Investment resources should be used while optimizing capital costs, seeking an efficient and profitable level. Investments in scientific-production complexes, large research centers, and similar endeavors promote the realization of fundamental scientific developments, including those at the interface of different sciences. It is necessary to invest in R&D-intensive productions. The latest technologies, production apparatus, and equipment are already developed

on the basis of major STP achievements. Investment resources should be allocated for technical re-equipment and the modernization of the existing enterprises on the advanced engineering and technological base.

The most important priority is the redistribution of capital investments in the branches providing STP acceleration, as well as establishing a sound ratio between investments in resource-mining, processing, and consuming branches. Resource-saving becomes one of the main criteria of investment policy. The most important avenues of this policy are a maximum use of investment potential and a radical rearrangement of the processes of capital construction. The system of strategic parameters of the investment policy is predetermined by the reconstruction of basic production assets and the potential of the economic branches that create assets. It is important to use a justified model of an investment coefficient, which is a ratio between the increment of a final social product and the investments in this increment. Therefore, in the near future, the share of machines and equipment in general investments should go up to 42-45%, and production investments should go up to 52-55%. Analysis shows that only 1.2-1.5% of basic production assets are replaced annually due to dilapidation and wear, and at least 4-5% should be discarded in accordance with service life and amortization norms. In comparison, these indices measure 6-8% in the United States, Germany, and Japan.

The development of international investment cooperation must be included in the parameters of investment policy. Here, the most complex problems are in how we can attain the corresponding investment balance. The current practice of calculating the economic efficiency of joint investments is inapplicable. The calculation of the total result (profit) must be specified. It must take into account losses due to the diversion of resources and the effects of their attraction. Discounting profitability rates can lead to a considerable understatement of the total result. This calculation is only possible in comparing variants, since when the effect is estimated, its real (nominal) value must be determined.

When realizing investments, the best method is to start from the concept, which includes the creation, development, and use of basic production assets as an integral unified investment process. The system of norms makes it possible to estimate the attainment of design parameters, i.e. the elements of the latter part of the capital costs lag. This system may include the following: limiting specific capital investments per increment of commercial output for the republic and its branches and per one released worker; providing for social and cultural projects; establishing normative periods of construction and design, and norms for plant

development; setting norms for the recoupment of capital investments; and establishing the rates of allocation into funds for social development and the development of production, science and technology. Measurement of a use value of projects, including selection from alternative variants, is very important.

Reconstruction forms of new basic assets must not be absolute in economic practice, but it is necessary to determine an optimum combination upon renovation of the basic production assets, and to double the rate of discard. Because the share of the amortization fund in capital investments grows faster than net investments and general accumulation, the importance of amortization facilities for compensating and extending the basic production assets must be increased under the conditions of economic reform and the increasing influence of STP. A regulating mechanism must channel investments in amortization facilities to technical re-equipment and modernization of the operating production, rather than to a physical increment of the basic assets of the previous productivity.

This requires a new economic mechanism, which will, as a rule, provide for the construction of projects and the creation of production capacities during a 2-year period. Starting complexes should be singled out at large construction sites. It is worthwhile to collect payment from enterprises or customers for uncompleted projects, beginning with the planned (normative) commissioning period. Payment should be collected for uncompleted construction within 2%, and in case of extension of the normative period, for the operating basic assets. To shorten the construction period, an enterprise is exempt from payment for newly introduced assets during the initial period of making production capacities operational. The funds released as a result of this are evenly divided between the customer and contractor. Redistribution of capital investments is reasonable for priority development of the material and technical foundation of the construction complex, and the accelerated increase of building industry capacities and the building materials industry. By 1995, the gap between economically expedient demand and the production of advanced materials and effective constructions will be considerably reduced, and by the year 2000 it will be eliminated.

The new investment policy is closely interrelated with the encouragement of scientific and technical innovations. In practice, however, scientific and technical workers are interested in creating samples of different inventions, without any connection with the economic scale of their application. The interests of those working in capital construction are generally centered on the cost parameters of investments motion (putting into operation basic assets and

capacities, capital investments development), rather than the technical, technological, and economic aspects of investment objects. Thus, out of 1408 large-scale construction projects in Kazakhstan that were examined by the beginning of 1990, the basic parameters of only 91 projects, or 6%, correspond to world standards.

Moreover, for a number of reasons, during the last 2 years, people lost interest in scientific and technical achievements. In Kazakhstan, beginning in 1988, integrated mechanization and automation of shops, bays, and productions fell by 18%, integrated mechanization and automation of integrated-mechanized and automated lines fell by 9%, and integrated mechanization and automation of industrial robots fell by 31%. The share of funds for increasing the technical level of production has also fallen.

A combination of measures is required to re-orient the interests of the participants in the reconstruction process. The measures must provide an integral combination of the investment process and scientific and technical production development, beginning with resource-saving. Controlling the investment structure according to the degree of connection with STP is an important measure. Economists suggest accomplishing this applying two new structural indices of investment activity, called intensification parameters. [24]

The first shows which part of all capital investments translates scientific and technical achievements into production capacities, which differ considerably both technically and economically from the operating productions. These projects are classified as "intensive," since they are the basis for intensifying extended production. Another parameter is a coefficient, which characterizes the improvement of the basic production and operation figures for intensive capacities (projects) with respect to the initial level. Here the indices, which express the most important output characteristics of production (productivity, capital productivity, specific resource consumption, etc.) at an intensive-type object, are compared with the corresponding indices of the initial level.

We believe that together the two indicated parameters can create a synthesis between the investment process and STP. The first parameter shows a direct influence of R&D on the efficiency of new systems of labor facilities. The second parameter shows the degree of investment participation in spreading STP achievements throughout the economic framework of the country, republic, region, and branch. On the basis of this, we can construct economic-mathematical models of the values of both parameters connected with the most important reconstruction indices of the economic system: putting into operation

and discarding basic assets, the growth rates of the national income, the dynamics of capital productivity, and others. This makes it possible to optimize investment utilization.

The proposed methodological principle is associated with statistical and expert analysis of the investment structure and the objects of innovation activity with respect to the level of their intensity. We believe that it can supplement traditional statistics of capital investments (reconstruction, technological, and branch structures) by estimating the figures with respect to intensification parameters, which measure the relationship between investments and STP. Here the most important consumer properties of the projects being developed and constructed must be estimated in comparison with the properties of basic (existing and replaceable) projects. Our attention should focus on productivity, economical efficiency, operational reliability, resource consumption, ecological safety, and other qualitative indices.

In order to orient the investment process towards STP, it is important to establish a proper taxation and credit policy. Tax exemptions should be justified and provided for investment intensive projects. They must have advanced technologies and involve new types of products required by the population. At the same time, high taxes should be imposed on all participants in the investment process (customers, designers, and contractors) for projects that do not satisfy STP requirements. The percentage policy of investment banks and other credit institutions must also be differentiated according to the technical and economic level of projects.

All stimuli should be "tied" only to the final efficiency of the projects, put into operation with the design parameters. Optimum taxes must be imposed on credit overdrafts for uncompleted construction and reduction (as compared to a permissible minimum) of a building stock. It is necessary to radically rearrange the system of estimating and stimulating the operation of planning and design organizations, so that they will be responsible for the quality and technical and economic level of the enterprises being designed. The system of selection and examination of the projects, included in the investment programs in Kazakhstan, is already being transformed. The most important production construction and modernization projects must be examined by independent experts who were appointed to expert committees and commissions by the Supreme Soviet and the President of the Republic.

The process of transferring investments to the social sphere proceeds mechanically and quantitatively, without adequately involving the reconstruction

cycle and its market mechanism, which can radically change the final efficiency of structural measures. The production equipment and technology of Group B products lags far behind both technologically and scientifically. For example, more than 50% of the equipment at the Shimkent cotton integrated works, Semipalatinsk textile knitting plant, and the Ushtobinsk, Ayaguz, Shchuchinsk, Kustanai, Atyrau, and Akmola meat-packing plants is now out-of-date and obsolescent.

Most of the productions issuing consumer goods have a very low science-intensity. Recently, Kazakhstan's machine-building enterprises had an average production science-intensity (ratio between R&D and volume of output) of 2.9-3%, and in light industry the science-intensity was less than 0.1%. Under these conditions, a simple increase in capital investments in the branches producing consumer goods may turn out to be wasteful, and not involve appropriate recoupment.

The most important way to solve the problem of the accelerated output of modern consumer goods is to design and create technologies and equipment for the branches producing large-scale goods. We must raise the level of machine-building intended for manufacturing production equipment for consumer goods production. This problem has two aspects. First, we must extend the amount and range of output of such equipment. Kazakhstan satisfies 95% of its demand for light industry equipment through import, and many machines for light industry are not produced in the country at all. In addition, the technical and economic level of production equipment for consumer goods must be raised considerably. Many kinds of production equipment lag far behind foreign analogs. The specific efficiency of newly created machines is often lower than that of the old ones.

Parallel to the increase in requirements for enterprises in other CIS countries, Kazakhstan has to develop corresponding machine-building productions. When necessary, we can convert defense enterprises and some heavy industry plants. The technological level of consumer goods production can also be increased if some machine-building takes place inside enterprises in different branches, including light industry and food processing plants.

This direction by no means implies the naturalization of the economy. The economy may well be industrial, if it is supported by a sufficiently developed specialization of components, units, and aggregates in the production of common machine-building articles. In addition, a high transformation mobility of the technological production foundation can be provided when necessary under the conditions of constant changes in the range of consumer goods.

It is also extremely important to rapidly implement a series of measures to increase the science-intensity of enterprises producing food and consumer goods in the republic. If an enterprise has a qualified scientific center, it can make drastic changes in the marketing, selection and realization of new types of products and the technological renovation of production. Attracting the necessary counterparts for realizing these aims will be a natural step in developing scientific and technical cooperation.

A structural rearrangement of production to meet public demand also requires more active external economic activity. The existing emphasis on raw materials in Kazakhstan industry makes it possible, of course, to obtain a great deal of currency income from the realization of the corresponding types of products on the foreign market. Thanks to this, profitable direct purchases can be carried out, as well as fast technological re-equipment, of a number of Group B enterprises, based on import instrumentation.

Here we must give preference to semi-finished products and articles with a high degree of processing, rather than raw materials. As a rule, the price of semi-finished products is 5-6 times higher for the seller on the world market than the price of raw materials. This gain can be essential for Kazakhstan, since the cost of labor, necessary for the additional processing of raw materials, is considerably lower here than in developed countries.

The conversion of the defense industry to meet social development needs is central to the general policy of economic reform. Since conversion implies significant changes in the use (investment) of material and intellectual values, it becomes an important factor in investment policy. The defense industry has a high science-intensity. Precisely that feature, and not the desire to quickly organize the output of consumer goods at defense enterprises, must be the guideline for conversion.

Calculations demonstrate that each ruble of the defense product removed from production during conversion can be replaced by a common civil product worth only 15-20 kopeks. This ratio is lower if simple consumer goods are produced. Therefore, defense enterprises should participate in creating up-to-date science-intensive products for the population, and in the formation of a production base which is capable of performing efficient social re-orientation of the economy. It should be taken into account that almost all defense ministries have been active in developing the large-scale production of machines, equipment, and machining attachments for internal use. Most often , this production was directed to high-tech, science-intensive equipment. This potential

of the defense complex must be turned to fulfilling civil requirements. On the whole, the potential of the defense complex exceeds that of civil machine-building by 2-3 times. In this connection, special benefits must be given to the conversion programs that involve high-tech equipment for increasing the production of consumer goods and services, and social development in general.

During the conversion of heavy industry, establishing productions of different building materials can be very useful. A large expansion of sales to the population and production cooperatives of production waste and nonstandard semi-finished products from the defense industries will also serve these purposes, especially if the products are at least minimally finished. A reasonable policy of additional training and instruction for employees who were released during conversion and the reduction of defense forces can become an important investment reserve.

The materialization of investments is connected with the theory and practice of predictions, which is usually based on applied diagrams of the basic production assets balance. It is static, however, and therefore does not show a deep functional interrelationship between the main elements of the extended reconstruction of basic assets. A dynamic model of the balance of the basic production assets is required. This model would reflect the changes in the investment process over time, the value of the basic assets increment with respect to the development of the national economy and the production of consumer goods, and describe its structural changes. The value of capital investments development, as well as uncompleted construction, should also be taken into account. Comparing the needs in basic assets for the future year with their availability in the current year, we can calculate the necessary capital investments. Here we must take into account compensation for the basic assets' discard due to wear in the current year. It is also important to remember that the basic assets will increase because unfinished construction, which began before the prediction period, will be completed.

The problem here consists of finding the parameters of a provisional lag. Estimating the past tendency of global dynamics of this index is insufficient. In order to analyze a particular investment process in a territorial (branch) structure, we must compare different alternatives of the ratio between capital investments, the value of the basic production assets introduced, and the increase in the volume of uncompleted construction with respect to temporary shifts. For a number of reasons, it is difficult to determine a predicted value of the provisional lag. In addition, the validity of prediction of the basic assets accumulation is

calculated over a long period of time. Obviously, the reliability of such a prediction is most significant for the period when capital investments turn into basic assets, i.e. a maximum of 10-15 years.

For predicting investment materialization, it is necessary to construct models according to the capital investment - basic assets scheme. In these models, we proceed from studying the process of realization of capital investments to converting them into basic assets, and discussing the functioning and compensation of the assets. The capital investment - basic assets models have several strata. They include both long-term programs of capital investments and short-term programs of modernization and compensation. There are many types of flows, caused by the process of capital construction and the accumulation of basic production assets, and they are repeated in dynamic proportions and ratios.

An important question in formulating predictions is what methodology should be employed to decide what prices the prediction should employ. We believe this involves both the complexity of price prediction and the relevant purpose. Estimating effects is not the same as analyzing the dynamics of the basic production assets. In determining the economic effect of STP, it is advisable to use anticipated prices. Since the reconstruction of basic assets is analyzed with respect to the dynamics of their physical volumes, predictions can employ effective prices.

The simulation of the development of basic production assets can proceed from the global level to the branch level and vice versa. We begin by constructing models of the separate branches. The successive approximation method (iteration) makes it possible to obtain a final prediction model. In addition, it is necessary to find working hypotheses of accumulation development in the production and manufacturing of consumer goods. Realization of the hypotheses must provide the most probable and rational solutions. Third, elements of optimization must be introduced into the prediction model by checking the solutions in the region according to the adopted criteria (indices). A comparison of the level of asset equipment (according to prediction growth rates of the basic production assets) with national income dynamics and the number of workers may help to improve this ratio so that it corresponds more completely to the growth of production efficiency. Fourth, the development of a general model of basic assets reconstruction must be oriented to global indices in economic development as a whole and Kazakhstan in particular, with regard to branch and territorial features.

The modelling procedure for investment materialization can be presented by stages. The first stage requires the analysis of the previous development of production accumulation, as well as the current one. Analytic investigation will make it possible to arrive at a pattern. The stage of modelling must include the construction of the principal hypotheses and an estimation of its global economic parameters. We believe that the given prediction can be constructed using several methods. The most widely accepted are normative-purposeful methods, based on a determination of public demand and the purposes of development, and descriptive methods, based on an analysis and extrapolation of development trends and limitations. This method makes it possible to estimate the inertia of creating basic production assets.

The third stage is characterized by a consensus between the estimates of a global index such as asset equipment. Here we must find consistent hypotheses and solutions and narrow down the range to the most probable solutions. The fourth stage of modelling is analysis of the results. Experts estimate if their proposed implementation is possible, and introduce corrections. At this stage, we may return to one of the previous alternatives, if necessary, and perform repeated iteration. We must simultaneously optimize the prediction of reconstruction of the basic assets by selecting the most efficient alternative.

Analysis of the process of investment materialization in Kazakhstan demonstrates that the dynamics of assets equipment, national income growth, and realization of capital investments are closely related. After the quantitative dependence of the dynamics of basic assets reconstruction on the indicated factors is established, it is necessary to determine if the relationship is a close one. The problem is solved by calculating a multiple correlation coefficient, which is a measure of how factor indices influence the efficiency index. The closer its value is to unity, the closer the relationship between the indices under investigation. [22]

Models for investment materialization in basic assets reflect the stability of the alternative prediction calculations. It is advisable develop three alternatives because prediction estimates contain an element of uncertainty, as a result of the complicated development of future economic processes. Therefore, predictions of the growth rates of the most important indices should be taken at three levels: the highest, the middle, and the lowest. This will make it possible to act with the greater orientation to the future, spot urgent trends in time, and make justified decisions.

A successful realization of the new investment policy is directly connected

with the program of stabilization and the transition to market relations. A system for regulating the investment resources market will be needed, which must first include economic methods. In Kazakhstan, we have developed ways to increase credit rates and impose new taxes, including urgent measures for changing the structure of capital investments, necessary for the formation of basic productions. Efforts are also directed toward the social sphere, whose development will transform all the other branches of the economy.

Establishing a market mechanism in the investment sphere involves drastic measures to eliminate destabilizing factors. The decision-making system for capital investments should be changed, instituting decentralization and taking into account the influence of the republic and the limitation of budgetary financing. It is necessary to optimize the share of capital investments in the development of basic branches of the Kazakhstan national economy. We must also provide capital investments in order to implement programs for creating productions, which is especially important for the national economy, as well as ecological and social projects for developing the most backward regions. Special capital investments must be provided for combatting natural calamities and financing unexpected and urgent projects.

Taking into account that the republic has gained sovereignty under a budget deficit, it is necessary to expand the composition of sources and forms of financing of capital investments. There is also a need to rely on bank credit with a competitive loan allotment and flexible interest rates. Decentralized financing sources strengthen the independence of economic interests under the indirect influence of the state. This is done by establishing reasonable taxes and tax exemptions, control over the minimum interest on credit, preferential crediting, inducing monetary movement between enterprises, the sale of bonds to cover commodities, etc. The functions of banks are changing in selecting the ways and means for controlling the investment activity of enterprises and the population, and developing the securities market.

On the whole, a conceptual base for balancing investment demand and the republic's offers must be substantiated by a complex of measures directed to the first period of economic stabilization. In addition, unfinished construction and civil engineering should be reduced under the transition to new economic conditions in the investment sphere by decentralizing control over the construction complex and ending economic monopolies. For these purposes, different forms of property are being developed in the republic, by renting some state enterprises and civil engineering organizations (primarily small and mid-

sized plants) with the right to form joint-stock property. Another method is to transform enterprises and organizations into stock companies and partnerships.

It is necessary to provide a transition to new organizational forms. The enterprises should voluntarily form collective bodies for regional and branch administration (unions and associations) and joint economic organizations (syndicates), and create a general infrastructure (trading houses, intermediate and informational and advertising centers). The enterprises and organizations which have monopolies for producing the products and services of the civil engineering complex must be reorganized into smaller units. Small building enterprises and provisional contract cooperatives should be created by selling marginally profitable and unprofitable enterprises or individual productions to cooperative and state cooperative enterprises, as well as to private individuals and foreign joint ventures.

The investment market in the republic is created and formed with government control through surveillance and regulation, including regulating productions and product turnover. This is accomplished through the formation of centralized funds for providing state orders for introducing production capacities and social projects. There is guaranteed preferential supply for this construction, provided by the centralized funds through a special-purpose branch system of material and technical supply. The reserve funds of material and technical resources are created in order to prevent and overcome interruptions in market processes and eliminate monopolies from the market. Special manufacturers' funds will be used to make compensations for various types of damage.

There are also large-scale changes in the principles of price formation. State control over price formation is superceded by competition and normative procedures for estimation and eliminating monopolies. During the transition period, the maximum and list prices per unit of building products could be used. As separate sections of market become balanced, this system can be replaced by a market mechanism of price formation, bringing the prices closer to world ones, according to expert estimates.

The possibilities for creating an investment market in the republic are concentrated in the area of the commercialization of construction engineering. Together with this, the conditions for extending joint enterprises are established in the economy. If free economic zones will be extended to oil and gas development, the share of foreign building companies will be increased. As a result, the share of building organizations the international contract market will

also grow.

The transition to market relations and development of the republic's socioeconomic potential through the construction complex will require new principles of contract relations. To this end, it is necessary to elevate the legal status and expand the functions of turnkey contracts according to progressive international practice. The parties will act independently in determining the conditions and mutual obligations of the contract and signing it. Turnkey contracts will become more prevalent, and will involve the imposition of material responsibility on the parties, and arrangements for various eventualities, including indirect losses and lost profit.

The production arrangement will require a procedure for qualifying the participants in the contracts according to their industrial, technical, and financial potential. It will be necessary to establish a system of contract support involving the banks, insurance companies, and other institutions which serve the same functions. Market relations will require the regulation of pre-contract relations, including the procedure of contract tenders, and the certification of materials, articles, structures, machines, devices, and technical processes. It is necessary to control the joint activity of foreign customers, contractors, and designers.

Implementation of the investment program will require an increase in the capacity and technical level of the production base of the construction complex. The production of traditional kinds of constructions and materials is reduced, in order to carry out radical modernization of the released capacities, taking into account the demands of modernization and technical re-equipment of the existing enterprises, and the newer demands of STP. Emphasis must placed on the accelerated development of small-scale mechanization production and team-rated output per complex. Due to regional peculiarities of Kazakhstan (remoteness and seismicity of certain regions), production of goods which have enhanced transportability, strength, lightness, and convenience must be widely developed.

It is necessary to make the best use of local raw material resources of waste and by-products of industrial production. In the distant future, the development of the investment complex must provide for the large-scale introduction of the latest scientific and technological achievements, resource-saving, technology, and reduction of the investment cycle. The success of the transition to new economic management of construction, under the conditions of market relations in the investment sphere, will largely depend on the competence of managers, specialists and economists, and how their training corresponds to market methods of management.

SECTION III
THE STRATEGY OF RESOURCE-SAVING ECONOMIC DEVELOPMENT

CHAPTER VII
RESOURCE-SAVING AND ECONOMIC FORMS OF PROPERTY REALIZATION

Competition and the variety of forms of property change fundamentally with radical reforms and the transition to a market economy. The development and restructuring of economic forms of property realization with the aim of attaining maximum efficiency, including resource-saving, becomes a key problem in economic management theory and practice.

It is difficult to solve the impending problems: The processes caused by the transition to a market economy require a fundamentally new approach to implementing resource-saving as a regular process, determined by the development of forms of property. Resource-saving is understood as a savings of present and past labor, influenced by the economic mechanism and by different forms of property. In practice, resource-saving is expressed in the economical consumption of labor, material, and financial resources, and the elimination of waste in all spheres of the national economy.

An objective necessity to investigate resource-saving as a complex economic category emerges with the conditions of a market economy and the change in forms of property. This is defined as a scientific reflection of regular processes in the development of production forces and public relations. A theoretical consideration of the content of the resource-saving category as an economic form of property realization is of fundamental importance and enables us to better understand its essence, role, and functions. After we have grasped the theory and explored the most important methodological approaches to the analysis of the economic content of this scientific category, we can investigate

the practical implementation. This is fundamentally important for the best application of resource-saving policy, which improves well-being. This approach allows us to analyze all the aspects of resource-saving and to correctly determine the strategic aims in developing production forces and relations.

In an economic system, advanced production relations serve as an incentive for developing social production forces and saving resources. The highly developed production forces then form a material base for savings, which will reduce labor input and the means of production per unit of final product. In addition, all economic indices of business activity are improved and, in the final analysis, the consumption of goods increases. The higher the qualitative and quantitative levels of production forces, the fewer labor and material resources are required to obtain a certain useful effect in the form of savings. For instance, a rational use of natural raw materials determines the result of resource-saving in ore-mining production. Its dynamics are dependent on the level of development of production forces and public relations.

The growing interaction of efficient resource-saving with the dynamics and qualitative improvement of production is a regular process, which is determined by the development and perfection of production relations and the increase in societal demands. These cause a growth of production, which correspondingly increases resource-saving potential. The growth of production and the consumption of raw material resources, as noted above, are now general phenomena and characterize world economic development. Many types of natural resources, however, cannot be restored.

From time to time, the world community has a shortage of raw materials, fuel, and energy. In view of this, the wasteful use of natural resources and worsening environmental pollution have become especially intolerable. At the same time, incomplete extraction of many products leads to excessive mining of raw materials, posing a growing danger to people, animals, and plants. By the year 2000, the total annual output of solid wastes in the former Soviet Union countries is expected to be 17 billion tons. At present, due to dumping, 8-10% less of the agricultural gross product is annually collected. About 150 million tons of waste are produced by the processing branches of industry, and only 10% of them are used. The rest is dumped and negatively affects the natural environment. All countries, including developed capitalist countries, are affected by the social and economic consequences of environmental pollution. In Germany, for example, environmental damage is estimated at 8% of the gross national product. Waste processing provides 1.5% of gross internal product in

the countries of European Community.

It is very difficult to stop people's irreversible destruction of the environment even by legislative acts. The constitution of the former Soviet Union and other state documents on radical changes in nature protection recognize that the problems of the rational utilization of nature, as a condition for the successful economic and social development of the country, must be solved immediately. A favorable ecological situation must be established in the regions with high concentrations of mining and processing industries. This is especially true for Kazakhstan. Kazakhstan's mineral resources gave the republic the important status and function of being one of the principal mineral, raw material, fuel and energy bases. There was an illusion that the region had wealth and inexhaustible natural resources, which caused the resources to be used extensively and inefficiently.

However, the positive influence of resource-saving on the environment has not been achieved. A system of effective measures is needed, the most important of which are economic key factors and stimuli for resource-saving and the reduction of environmental pollution. The experience of foreign countries warrants our attention. For example, in Germany key factors for resource-saving control include certificates. These are used to impose a surcharge on all enterprises and organizations which adversely affect the environment. The certificates establish a certain norm of harmful waste discharge, which is subject to a relatively small fee. If, however, this norm is exceeded, the fee increases considerably. Moreover, the amount of permitted discharge is reduced annually and the fee is differentiated for separate branches and regions of the country. [1]

This system induces the firms to actively make ecological investments. At the same time, fees assessed on environmentally harmful enterprises go into a special fund, which can be used to finance measures for environmental protection. Many specialists object to raising taxes on harmful discharges, sewage, and other waste. They claim that the ecological effect of very strict legislation is not in line with the outlays made by the manufacturers, but rather places them at a disadvantage to foreign competitors. The interests of the whole society, however, are far more important than private interests. The inappropriate utilization of secondary resources must become unprofitable and must reduce the income of the enterprise. A fee for the inappropriate use of secondary resources should be a part of the fee for natural resources (including land). The fee should be deposited into the local budget of the place where the enterprise is situated. The principle is as follows: the tax on secondary resources must be determined

by the level of their use at the enterprise producing them.

In the future, the increased promotion of material resource-saving will be all the more important as a sharp increase in environmental pollution from waste is expected. For example, at the present time, an average of 100 billion tons of different rocks are annually extracted from the earth's interior, and 70-80% become waste which pollutes the environment. The volume of all types of waste grows by 5% per year. According to the materials issued by the International Corporation on Scientific Investigations and Technology, a predicted global increase of environmental pollution will be characterized in the following way. During 1970-2000, the volume and structure of annual remains from production and consumption in the world will increase. The amount of basic gaseous atmosphere pollutants will increase from 19.7 to 50.8 billion tons; the amount of solid substances ejected into the atmosphere from 0.24 to 0.72; solid inorganic waste will increase from 5 to 15; petroleum products will increase from 0.07 to 0.24; and organic agricultural waste and domestic garbage will increase from 14.1 to 37.4 billion tons. [2]

Dust and gas emitted into the atmosphere reduce the size of agricultural crops and the productivity of forests, and accelerate the corrosion of machines and equipment. Water pollution causes a decrease in fish stock. Storage of solid industrial waste reduces the available land and mars the landscape. Pollution into the biosphere causes an increase in morbidity among workers and reduces their capacity for work. The ecological state of the surroundings increasingly determines the standard of living, and the ecological significance of resource-saving due to nature preservation measures steadily increases. More attention is paid to the rational use of natural resources. Environmental protection becomes one of the most important conditions for the social and economic development of the country and the improvement of well-being.

The complex use of mineral resources is a global problem. The technical and technological potentialities of a complex use of raw materials are already significant and continue to grow. A better use of raw materials will make it possible to reduce industrial discharges, utilize production waste, reduce environmental pollution, and institute waste-free production. The procedures for a complete and complex use of mineral raw materials enable us to take advantage of those deposits which were considered to be economically inexpedient when only one or two basic components were extracted. Here, as a result of processing the available waste and extracting additional mineral resources, a raw material balance (stock) of one or another metal (component) increases.

Secondary raw materials in the form of waste turn into a new use value, improving the state of the environment.

Resource-saving, due to its special importance and the direct dependence of forms of property on means of production, should be considered an economic form of property realization. It is incompatible with a consumer-based approach to nature, which must be excluded from economic practice. A rational use of available natural resources and a reduction in the negative impact of air and water pollution must be fundamental components of resource-saving policy. Hence we must build modern gas- and dust-trapping plants, eliminate sources of pollution, introduce low-waste and waste-free technologies, utilize harmful substances from exhaust gases, and use ecological types of fuel.

During the process of technical re-equipment, Kazakhstan needs to establish productions with closed technologies and enterprises that do not create harmful discharges or sewage. This is the most efficient way to preserve the ecological balance. However, we still underestimate the value of this technique for protecting nature and creating the maximum savings of raw material resources. Scientific investigations and actual practice do not always consider the effects of economic damage from pollution. Thus, the technical and economic substantiation of modernization frequently does not consider the harmful substances being discharged and the additional products which can be obtained through the utilization of harmful substances. The measures taken so far have not been very efficient and did not alleviate the ecological situation in the country. This problem requires a fresh approach. The enterprises must exert more responsibility and the rights and powers of the local administration must be exercised. Strict state and public control of nature protection legislation must be established. A coordinated program of nature protection is necessary, and must be reflected in international agreements. Another problem is to combine intellectual and material resources, including international resources, for ecological recovery. All this must become an integral part of the national program on ecology.

It is necessary to introduce into the market model of economic management the stipulation that for each ton of discharge into the environment, the corresponding fee will be collected from the enterprises, irrespective of the form of property of the means of production. This will increase the economic responsibility for resource-saving.

Savings as a form of property realization is characterized by achieving a certain positive result, not only from using natural material resources, but from

all material factors of production (subjects and facilities of labor) as well. Resource-saving characterizes a qualitative aspect of labor and must be considered as one of its most important results. The savings is a result of using materials, facilities and subjects of labor, as well as workers and their labor. The method of combining the given factors of production in resource-saving will be specific for different forms of property, but there are common features as well. Thus, irrespective of particular forms of property, there is a common demand to achieve the maximum results for minimum output of existing and past labor. Implementation of the principle of economic efficiency becomes a strategic direction of extended production in a mixed economy, moving to market methods of economic management. The law of time-saving acts in all branches of the economy.

All this indicates that the principle of economic efficiency must not be understood in narrow sense, which does not take into account the new role the human factor plays in the society and its prospects for economic development. Economic efficiency reflects the economical attitude of production workers towards property, the rational use of labor, material, and monetary resources, and the elimination of waste of capital and losses in all sectors of the national economy. Implementation of the principle of economic efficiency reduces labor input and means of production costs per unit of the final production, improves all the socioeconomic indices, and increases accumulations. This is designed to obtain the maximum useful effect of the national economy - achieving the maximum socially useful economic effect with the minimum expenses, and raising the standard of living.

With an unequal input of living and materialized forces, the ratios between useful effect and expenses are, as a rule, different. Hence it follows that the application of the principle of economic efficiency is associated with the most advantageous ratio between useful effect and expenses. The society must deal with this and a wide range of problems in the area of extended reconstruction, particularly in using means of production and manpower. According to the effect/expenses ratio, the size and types of resources will change and the society can make rational decisions on their appropriate use. This will reveal one of the aspects of production relations, which describes the resource-saving use of property on means of production.

An important result is achieved in saving work hours, which makes it possible to increase material goods with the same labor input. Any savings (including the savings of material resources, the improvement in forms of

property, the optimization of investment, a proper structural policy, improving the skills of workers, and introduction of advanced economic mechanism) will save work hours.

A methodological analysis of saving time enables us to study how this relates to different forms of property. This results in reducing labor input per unit of use value, which stimulates a search for methods of efficient time-saving control. In addition, there is a change in the ratio between the input of living and materialized forces. Here two alternatives are possible. When manual labor is replaced by mechanized labor and living force input is reduced, the input of past (materialized) labor per unit of production is increased both relatively and absolutely (with gross input being reduced). A second scenario takes place when past labor input increases only relatively, but its absolute value is reduced. This takes place when outdated equipment is replaced by new, more advanced and efficient resource-saving equipment.

Finally, the law of time-saving acts in the rate of turnover of production assets. It proceeds in time, which includes production time and turnover time. A reduction of turnover time is one of the great reserves of resource-saving. There is the objective possibility of making more products in a given period with the same resources. Hence, the results of turnover acceleration are equal to resource-saving. A slowdown in turnover, due to stocks above the norm, inevitably involves additional resources in production.

Resource-saving as a form of property realization can and must have more positive results than at present. This is explained by the fact that there are great reserves for the growth of social production efficiency in the principle of economic efficiency. To see if this statement is valid, we can analyze the degree of utilization of material resources. The facts demonstrate that resource-saving has not yet become a strategic avenue for the growth of national economic efficiency and especially of material production. Our use of raw materials, fuel, and materials is extremely uneconomic. As noted earlier, from 15 billion tons of rock mass (26% of world mining) mined annually in the former Soviet Union, only 10% is turned into a useful product. A number of useful components are extracted with quite low indices. The metal consumption of machine equipment is very high. On average, our machines are approximately by 20% heavier than the best analogous foreign machines, according to NIITMash calculations. At the beginning of the 1990s, 30% of melted steel was lost in the production of rolled metal.

The problem of conserving energy resources is especially urgent. Energy

consumption of the gross national product in the countries of the former Soviet Union is 75% higher than in the United States, 80% higher than in Germany, and more than twice as high as in Japan. We spend much more energy to produce a unit of product than do industrially developed countries. To produce a unit of product, Kazakhstan employs four times more people than does the United States and five times more people than does Japan. This is a function of the same factors: poor organization of labor, backward technical base, under-qualified personnel, inefficient economic structure, etc.

Many scientists believe that technological energy-saving is the most important step we can take today. Replacing our equipment with state-of-the-art equipment would reduce current energy consumption by more than a third. This is unutilized potential. It is economically inexpedient to fully realize it with our relatively cheap energy resources. Realization of 55-60% of the technological potential of energy-saving corresponds to the national-economic optimum (taking into account the ecological impact).

For resource-saving, it is important to accelerate the process of rearranging the economic production structure in favor of the processing branches with low energy consumption. The economy must be restructured from the priority development of production of means of production to increasing consumer goods, which may yield a significant savings of energy resources. On the whole, it seems possible to reduce energy demand by third at the expense of structural rearrangement. If we consider the growth of energy supplies to meet personal needs, which is necessary to raise the standard of living, the predicted level of energy consumption in the year 2010 will be 2.6-2.8 trillion kilowatt hours. In the previous energy program, this level was planned for the year 2000. [3]

The previous energy program allowed mainly for the development of nuclear power engineering and the coal industry. The new strategy, in comparison, is oriented to the prior development of the gas industry during four to six five-year plans. Using gas radically changes the ecological characteristics of power engineering. It makes it possible to completely eliminate discharges of sulphur and ash oxides, to reduce the emission of nitrogen oxides 3-4 times, as compared with coal and residual oil, and to halve the output of carbon monoxide, which contributes to the greenhouse effect. Gas reduces expenses for mining, transportation, and utilization of fuel by 20-30%, as compared with coal and nuclear energy. It also dramatically improves labor and living conditions. Wide-scale application of gas will make it possible to accelerate the technical re-

equipment of electric power engineering and thermal equipment in Kazakhstan.

An international comparison of the results of resource-saving does not speak well of the Soviet economy. Therefore, it is necessary to intensify the resource-saving process and reduce the relative share of demand. This is especially true because growing social production increases the demand for raw materials, fuel, energy, and equipment. The volume of material resources consumed in the former Soviet Union doubled each 10 years, and the amount of electric power, natural gas, mineral fertilizers, and cement increased even faster.

Meeting social requirements with material resources becomes more complicated each year. Mining conditions in easily accessible regions are deteriorating because the developed deposits are becoming exhausted. For example, the volume of deep drilling increased significantly in oil and gas condensate. In 1950, an average depth of an oil well was 1350 meters, in 1970 it was 2500 meters, and at present it exceeds 3000 meters. In the 1970s, the production of 1 ton of oil required new capacities at a cost of 46 rubles, in 1985 it cost 88 rubles, and in 1990 it cost 129 rubles. In addition, the quality of the feedstock in exhausted deposits became worse and additional mining was required. Thus, an average content of iron in ore fell by 15-20% during the last quarter of century. In 1955, workers had to add 1.2 tons of raw ore in order to obtain 1 ton of concentrated ore; in the 1980s, they had to add more than 2 tons. Because of this, the specific capital investments in iron ore mining increased more than threefold as compared with the 1960s.

The second reason is that supplying resources becomes more complicated because the materials in easily accessible regions are exhausted and we need to develop the more remote regions. For instance, 80% of material resources of CIS countries are in the east, in Siberia and Kazakhstan, and the development costs are extremely high. The resources become more and more inaccessible and this raises the cost of the gross national product. For example, to transport 1 ton of Siberian coal to the center of Russia, to the main consumption points, costs 5 times more than delivering it from Donbass. Investigations demonstrate that approximately 2 rubles of capital investments were spent in the 1960s in order to extract 1 ruble's worth of mineral raw materials, and this cost went up to 7.4 rubles in the 1980s. [4]

The given data demonstrate that supplying the economy with resources becomes more complicated and expensive, and suggest that there is no alternative to the transition to resource-saving reconstruction. Expensive economic development doomed the country to stagnation, since many extensive

methods of development have been exhausted. Calculations show that if we continue to provide the planned increment of national income on the same extensive basis, every five years it will be necessary to increase mining of fuel and raw materials by 10-15%, capital investments by 30-40%, and to involve 8-10 million additional people in the national economy. We do not have these possibilities and this growth is unnecessary. We must reject the extensive methods of economic growth. The country is well supplied with resources and should use them economically. The market is the most powerful tool for accelerating STP and resource-saving. During the transition to market relations, the economy may develop intensively with the increased efficiency of the entire national economy. The demand for resource-saving will grow. In that connection, the importance of all resource-saving factors will be increased. Of special importance will be the transition to efficient forms of property realization. The manufacturers will become the real masters of production and we must combat the alienation of workers from the means of production and results of labor. The given process is possible on the basis of developing different forms of property, putting an end to the exploitation and alienation of workers from the means and subjects of labor.

A thorough analysis of economic property relations is a prerequisite for understanding the many conflicting interests of different subjects of economic management during the process of saving material and labor resources. This also is the most complicated problem of resource-saving under the conditions of the market model of economic management. Property reveals interpersonal relations as regards the appropriation of means of production and results of their use. Herein lies economical meaning and the content of property as a scientific category.

Ownership of the means of production is the socioeconomic basis for the appearance and development of corresponding production relations. Social ownership of the means of production was considered to be a necessary condition for the progressive development of production forces. This abstract interpretation of property relations is insufficient, however, for a rational and efficient arrangement of the economy on the basis of the resource-saving. The careless and wasteful handling of resources, discussed above, is connected to the alienation of workers from the means of production. This is especially evident at state enterprises, which have a decisive impact on the economy. A transition to a civilized market is possible under the conditions of variable forms of property, which induce every worker to save all resources.

In the final analysis, real savings conditions can be implemented only on property relations, realized by each worker separately and materialized in the economic mechanism. An essential drawback of the earliest economic mechanism was that although social ownership of the means of production had been declared, it was not fully realized. Even now, most people are not concretely affected by the change.

Under the conditions of market economy formation, a revolution in relations of ownership of means of production is developing along the following directions. The first is characterized by the fact that means of production pass to the workers, who are interested in and capable of using them economically in production processes. This is not a monopolistic system: Each worker is an owner of the means and subjects of labor, which can be used together in the most efficient economic manner.

The second direction, the assertion of collective ownership of means of production, is characterized by the fact that labor is also a factor in resource-saving. No worker can live at the expense of another; as owners, all the participants in production are equal. The socioeconomic differentiation is based on the quantity and quality of the labor, and its economical, and therefore productive, use.

Finally, an important way to combat the workers' alienation from the means of production is to have them participate in managing the resource-saving process. This is an obligatory indication of collective ownership. The savings of production factors is one of the economic forms of collective ownership. As a result, a considerable democratization of the economy occurs, the number of private enterprises increases, monopolies are broken up, and small enterprises are privatized. Business and competition develop. The national economy is stabilized, which makes it possible to use material resources more economically and create optimum production stock. The released resources will supplement the market of means of production and promote its stability. Efficient forms of property and savings conditions are therefore integrally interconnected. In any case, resource-saving is provided by the owners of the means of production. A real degree of the workers' participation in the management of means of production, and therefore in resource-saving, is an indicator of the maturity of property relations under conditions of competition between its different forms.

During the process of privatizing state enterprises, corporate, collective, mixed, private, and other forms of property appear. These are all connected to increasing the efficiency of social production and, hence, to resource-saving.

The latter becomes an economic form of property realization, which develops completely in the market economy. In its current interpretation, the market rejects the monopoly of one form of property, and requires variety and economic and political equality. The joint interaction of different forms of property, including state and collective property, whether owned by a farmer, a craftsman, or a family, strengthen the democratic bases of the society. This is because the working people become the real masters of the means of production and the results of labor, and are personally interested in efficient work and high-quality final results. This requires having control over economic processes on the basis of market laws, thereby creating new and powerful incentives for economic business activity.

With a fully operative market, it is possible to uncover real demands, to discover the methods to efficiently meet these demands, to balance supply and demand, and to create normal, natural conditions for production development. The market, however, should not be considered an end in itself. It is the most important means for increasing economic efficiency and raising the standard of living. If necessary conditions are observed and the transition to a socially-oriented market takes place in an appropriate manner, the market shapes the economy to meet people's needs. What are the are ways to reform property relations? How we can achieve variety and equality of forms of property?

The general principle for CIS countries to follow is to emphasize the variety and equality of forms of property, which make it possible to use each form where it will be the most effective. We are moving to a mixed economy. Proceeding from a sound estimate of the real situation, we can predict that the conditions of present-day production, historical traditions, and the social environment will determine the priority of social forms of property, that is, joint-stock, cooperative, and collective property. At the same time, based on our own and world experience, we can speak about the essential role played by state property. Where private property is competitive and efficient, it has the right to exist.

Each form of property must be considered from the historical point of view, in connection with the achieved level of development of production forces and relations. State and collective forms of property materialization are economically efficient at a high degree of mechanization, concentration, and specialization of production. Small private (individual) property is inefficient when production has reached a high scientific and technical level and a substantial scale, but has economic advantages in the branches and sectors where

the concentration and technical state of production have not yet reached a high level. It is advantageous wherever there is small-scale production of goods and services. If the production forces have not completely developed but small private property was nonetheless completely abolished, this will inevitably have negative economic and social consequences.

As the corresponding material and organizational conditions are developed, the sphere of state property application will become narrower, while the sphere of public ownership of the means of production will expand. The property relations will acquire more varied forms with a distinct differentiation of their legal regulation. This can be achieved by making the state administration more democratic, by increasing the role of public organizations, and by establishing different forms of self-management. A transition to the principle of profit-and-loss accounting and the conversion of work collectives into real owners are inseparable from political democracy, the expansion of the real rights of enterprises, and an increase in the role of working people in management and the control of production, distribution, exchange, and consumption. Without this, the realization of the economic, social, and moral potential of state and collective properties is impossible.

Economic research and an analysis of current practice demonstrate that joint-stock enterprises should be used widely in creating conditions for the formation and development of varied and equal forms of property. The development of joint-stock relations is fundamentally important and must take into account both the progressive experience of other states and the historical traditions of our countries.

Considering the different forms of property as the economic realization of resource-saving, we must make clear-cut formulations. Determining the objects of rights of property, we should proceed from the fact that all national wealth, including land, the interior of the earth, other natural resources, and the potential created within the boundaries of the republic, is its integral property. This is a fundamentally important initial point, without which sovereignty is impossible. One cannot be economically independent without possessing property. The entire history of Kazakhstan has proved this. This principle is vitally important for Kazakhstan, since its economy is based on raw material branches and basic production, which until recently were considered to be private domain.

In Kazakhstan, for example, the rate of property privatization, especially at the first stage, will be considerably lower than in the former Soviet Union as a whole and in many other republics. This is associated with economic factors as

well as the extremely unbalanced location of production forces over the territory of the republic, and the multinational composition of the population. If any of these elements is not taken into account, it may distort the economic situation and aggravate both social stress and the political situation. We must resist the temptation to institute a forced transition to a market economy. We have, indeed, already learned the bitter lesson of "acceleration." Much time will be required to enter the market. The formation of complete market will continue much longer; therefore we must make a correct and objective assessment of the degree of risk at this turning-point.

The general principle of privatization is that the working people themselves could, in effect, carry out this wide-scale program. The specific and most expedient methods, which make it possible to advance the development of various forms of property, had to be found everywhere. We must carefully analyze the extent and period of privatization. For example, some programs allow only 400 days for businessmen to receive ownership of 56% of the basic assets in industry, 75% of civil engineering potential, 65% of agricultural property, and 80% of the property in the trade and service sectors. These goals are neither practical nor necessary. We must consider the fact that the production base of many state enterprises has been generally established in nonmarket form. The former Soviet Union is a huge economic organism, with a very complicated infrastructure, where production, supply, and sale of products worked in unison. We should assume that in the immediate future, not more than a third of state property can be privatized. This will ensure the stability of a new economic policy.

The program does not mention that is desirable to institute voluntary privatization, with the consent of working collectives and organized through the local authorities. In other words, the property should be given over before deciding how it will be used. This measure will make it possible to strengthen the role of local authorities of all levels and eliminate possible mistakes in initiating reforms.

Property privatization is one of the principal elements of economic reform. Nevertheless, our knowledge of the world experience in privatization is obviously insufficient, we are often apt to draw simplified conclusions, to substitute new slogans for old ones, and to exchange new dogmas for old ones.

The key problem is the transformation of the state sector. Even after we have removed the obstacles from the path of individual and group-owned business, we must not delude ourselves that the private economy will soon

become the basic motivating force for the transition to a market economy. With most enterprises in the hands of the state, the future of private business depends to a large extent on the evolution of the public sector.

At present, the state, which possesses 92% of production property, has a monopoly. This naturally prevents the national economy from functioning efficiently. Until recently, the state dictated what should be done, set prices, selected customers, and solved all the other problems. When the state monopoly is replaced by many independent, free and competing owners, a market economy will emerge. This requires property privatization up to certain limits. In all developed countries, between 5 and 35% of all the production property is in the hands of the state.

We believe that state property must not exceed a quarter of the basic industrial assets. This property is divided into republic-owned and municipal property. According to our estimates, the first category must account for approximately 20% and the second for 5-10% of the now-existing total production property. How can we privatize the lion's share of the state production property? Several avenues are available, beginning with the privatization of the service sector, i.e. the sale of small and medium-size shops, restaurants, repair shops, fashion houses, and so on. Will this contribute significantly to the advancement of privatization?

The well-known programs, including "Five Hundred Days" and "Parity," consider this to be the most important task. However, we can only sell small and medium-size trade, service, building, and transportation enterprises for the sum that people can pay. According to different data compiled in 1990, the population held between 100 to 150 billion rubles of so-called excess money. Since the cost of basic assets in the former Soviet Union was 1.8 trillion rubles, the volume of the state property will be reduced by less than 10% as a result of the privatization of trade, services, and similar entities.

There are other ways of privatizing state property. We are pinning our hopes on leasing state enterprises and having working collectives subsequently redeem them. This, however, creates a deadlock. First, leasing is not a part of privatization and does not change the form of property, which remains in state hands. Instead, leasing is a rearrangement of labor, which increases efficiency, the workers' interest, etc. As far as leasing with redemption is concerned, calculations made by all the specialists, including those who worked on the "Five Hundred Days" program, demonstrate that redemption to a normal level will take about 10 years, and a complete redemption will take 25-30 years.

Consequently, until then, we cannot rely on the appearance of a concentrated market.

Medium-size state enterprises issue stocks, which are bought mainly by state enterprises, because the majority of the population has already invested in the privatization of the service sphere. In this case also, the state is moving money from one pocket another. The process of privatizing state enterprises is extremely limited. The solution can be accelerated by transferring 50 or 70% of the property of the state enterprises to the people. To this end, it is necessary to issue and distribute national stocks for the total cost of the property, which must then become private. Working people, pensioners, servicemen, and students will possess the stocks. The sum of the stocks obtained will be dependent on certain factors. Although other approaches are possible, the basic criterion, which can provide for social justice, will probably be labor service.

A person who has national stocks can receive small annual dividends from the state. It is more profitable, however, to invest these stocks in an enterprise which will produce a larger income. It is also possible to buy out the enterprise, by combining the stock belonging to all the members of the working team, and that belonging to others. This approach results in a faster privatization process and takes two to three years. This method is not only more dynamic, it also has a social orientation. Each citizen obtains a share of the national property and has the right to use it as private property. He can sell, exchange, or bequeath his property. An owner is the only person who can completely take charge of his enterprise. He can hire workers and an administrative staff, determine production and costs, choose customers, etc.

Self-regulating mechanisms, characteristic of the market economy, will best coordinate the activities of all the manufacturers, and create a rational use of labor, material, and financial resources. Market and competition require that the production be adaptable and receptive to STP achievements. The transition to a market economy will make it possible to tie our economy to the world economy and make the achievements of world civilization accessible to all citizens.

Under the conditions of market management, the administrative and commanding system (leading to state wardship, dependency, wage-levelling, apathy and bad management) must be replaced by economic freedom, the working collectives and citizens being responsible for their own well-being, directed and well-organized labor, and compensation in accordance with the results of labor. At a certain time, the transition to a market economy will make it possible to create an economic basis for uniting a majority of CIS countries in a

form they choose of their own volition.

There are a number of prerequisites for an efficient market economy. The principal avenues for stabilization of the national economy and the transition to a market economy include:

1) *The creation of maximum economic freedom for enterprises.* Free commodity producers - who increase national wealth when they add to their own property - form the basis of the economy. It is necessary to recognize the important social role played by active, skilled, and talented people, such as workers, farmers, engineers, businessmen and production organizers, and support these people in every way;

(2) *Economic organizations, businessmen, and all workers having total responsibility for the results of economic activity,* based on the equality of all forms of property. Reforming property relations consists of determining precisely who is accountable for the results of economic management and in finding the most efficient application for each form of property during economic development and specifically resource-saving;

(3) *The development of competition between producers as the most important factor in stimulating economic activity,* increasing the variety and quality of products according to consumers' demands, realizing savings, reducing expenses, and stabilizing prices. Development of sound competition requires, naturally, eliminating economic monopolies and creating the corresponding production structure;

(4) *A policy of free price formation.* Market mechanisms can operate efficiently only if most prices are set freely, balancing supply and demand. State regulation and price controls are, in principle, permissible, especially during the transitional period. As the deficit is reduced and the market saturated, state control will be limited;

(5) *The restriction of state regulation of economic activity* (except for in certain special fields);

(6) *The distribution of market relations,* starting with those spheres where market relations are more efficient than administrative forms of regulation. At the same time, a considerable non-market sector must be retained. The non-market sector includes areas that are not defined by commercial criteria alone (defense, public health, education, science, and culture);

(7) *The economic succession of integration into the system of world economic relations.* Economic organizations have the right to carry out foreign economic operations. Foreign firms operate on the domestic market on equal

terms with all the producers, according to the established legislation and accepted international rules.

The market can provide for the economic efficiency of production. A market economy, however, requires state and public regulation to prevent negative phenomena such as inflation, unemployment, excessive property differentiation, production instability, and the unequal development of separate regions. In carrying out macroeconomic policy, the state must encourage the formation of a favorable environment for economic activity, which corresponds to social interests. State regulation in general and resource-saving supervision in particular must be based on a clear separation of powers between the legislative, executive, and judicial authorities.

We have chosen to make the transition to a market economy, and this has historical importance for the development of the economy and the implementation of resource-saving. The major issue now is how this should be accomplished and what are the best and most reliable ways of doing so. The transition to a market economy and the efficient functioning of the market mechanism of self-regulation are possible only if commodity producers, enterprises, organizations, and citizens have freedom in their economic activities and business dealings. They must have the freedom to use their property as they see fit, to determine an independent production program, to select suppliers and consumers, to fix prices, to use after-tax profit, and to solve other questions concerning economic activity and production development. These rights will make it possible not only to create the necessary conditions for a market mechanism, but to stimulate the people's potential as well. In order to form commodity producers - the most important element of a market economy - the majority of enterprises should be removed from state wardship as soon as possible and privatization should be instituted. Privatization is not only the transition to private property; it involves a general process of changing ownership by transferring or selling state property to collectives, cooperatives, stock-holders, foreign firms, and private individuals. It is necessary because the indicated subjects of economic management correspond to the demands of a civilized market economy. They behave independently and are economically responsible for the results of their actions. This will provide for a rational use of all resources and will delay the process of redistributing resources for consumption at the expense of the improvement of production potential.

Different methods can be employed to transform state property into private property. The specific avenues of privatization will be determined with respect to

the individual features of the regions, branches or production, the state of assets, and other factors.

CHAPTER VIII
THE RESOURCE-SAVING METHOD FOR INCREASING PRODUCTION

The strategic avenues for the development of Kazakhstan's national economy with the transition to a market are closely related to a new quality of economic growth of intensive resource-saving. In this process, the center of attention is transferred from increasing raw materials production to their best utilization by means of a more complete extraction of useful substances and the reduction of specific consumption of raw materials per unit of useful effect. As a result, material consumption of products is reduced and resource-saving becomes one of the principal stable socioeconomic factors in national economic development. The transition to resource-saving is also dictated by a high specific weight of expenses for raw materials in the cost of finished products. In addition, rich and easily available deposits are being exhausted, which raises the prices of mineral resources. Savings then becomes a major avenue to increase production efficiency. The cost of saving raw materials and energy is less the cost of production. For example, the cost of saving energy is 2 times less than the cost of producing the same amount of additional energy.

How can we realize a regional formation of a new quality of economic growth, while implementing resource-saving production development? To answer this question, let us compare the growth rates of produced national income (economic growth) and the corresponding consumption of material resources. Analysis demonstrates that the material consumption increment still outpaces the increase in pure products. Material consumption of products in the

last five years was 61.3 kopeks per 1 ruble of the gross social product, 1.4 kopeks more than in the previous five years (59.9 kopeks).

In the eleventh five-year plan, 1.49 rubles of material resources (including amortization) were spent in order to produce 1 ruble of national income, and almost 10% more resources were required by the most recent plan. Over-expenditure of material resources was 2.3 billion rubles, with respect to an average annual volume of the national income. If the planned calculated ratio between material costs and national income were fulfilled (1.53 rubles), material resource-saving would annually average 1.3 billion rubles. This demonstrates that in the branches of the national economy, extensive production development continues to be at the expense of involving additional material resources and reducing the level of their utilization. As a result, the republic is moving very slowly towards resource-saving production development.

A number of programs are required to stabilize the material consumption level, increase the production of national income, and carry out resource-saving policy. There is an active process of introducing material- and energy-saving machinery (technology) which requires us to solve certain problems. In Kazakhstan, production machinery is worn out, resource-saving machinery is scarce, and few new technologies are operating. For example, although an efficient material-saving procedure has been developed for the dry method of cement production, it has not yet gained wide acceptance. In the republic, only 13% of the total volume of cement is produced by this method. This is more than 4 times lower than in the United States, Germany, and Japan. In machine-building, the share of products corresponding to the world technical level is 17% of the total volume of specific production and 11% of the total volume of products.

We cannot make the transition to resource-saving production development, and thereby attain maximum savings, without a wide-scale introduction of new resource-saving machinery and technology. Let us use the example of machine-building. By the early 1990s, only slightly more than 6% of all completed work in research institutes and design departments corresponded to the best foreign developments. This is explained by the fact that sometimes an optimum level of the new worldwide machinery indices serves as a criterion, but often a functional cost analysis of material expenses is used instead.

An example of this approach is the cost reduction analysis performed at the Alma-Ata heavy engineering plant. To classify new machinery, the staff took indices of specific metal consumption, using the "local" indices as an analog.

For example, a wire draw bench is used as an analog for a continuous mill which manufactures copper and aluminium wire. A gear-rolling mill is used as an analog for an automatic transfer line for manufacturing sprockets. Their economical efficiency per one article (kg) and annual program (t) is compared. In this case, the method of selecting an analog is important. The indices of this analog may be not higher than the world standard. Can this equipment be considered new? Consumer characteristics of resource-saving equipment cannot be described only by an index of the specific metal content. This machinery serves as a material basis and a means for saving natural raw materials, and not only as a resource of economic growth. This means that the novelty and quality of the resource-saving equipment must be characterized by a number of indices, including productivity, fund and power consumptions, and the length of investments repayment. Classification of new resource-saving machinery requires an entire system of corresponding indices.

It is well-known that the world's best machinery establish only the minimum demands. Consequently, promising developments of new resource-saving machinery, reflected in patent information, must be taken as the basis for comparison. Owing to this, labor will turn into a scientific process or experimental science. Introduction of new material-saving machinery and technology, replacing traditional models, becomes an important factor in resource-saving production development.

A low qualitative composition of basic production assets has a harmful effect on the utilization level and the savings of raw materials. Thus, the yield of capital investment in Kazakhstan is slightly over 25 kopeks per 1 ruble of basic production assets. These indices are 41 kopeks in Buelorussia, 38 kopeks in Ukraine, and 33 kopeks in Russia. In the republic, the lowest yield of capital investment is in power engineering and heat and power engineering. Here, from 1 ruble of basic production assets, only 6.8 kopeks of pure products are manufactured. These figures are 7.7 kopeks in coal industry, 11.2 kopeks in the chemical and petrochemical industry, and 12.4 and 17.4 kopeks in ferrous and nonferrous metallurgy, respectively. At the same time, the yield per unit of assets in light industry accounts for more than 100 kopeks, 229 kopeks in the food industry (which is associated mainly with price formation peculiarities), and 33.2 kopeks in machine-building and metal-working.

The republic now faces the objective necessity of a wide-scale renovation of basic assets. This is the most important condition for the transition to resource-saving production development and the qualitative development of

production forces.

There are different ways of instituting production with resource-saving machinery. Studies show that the most efficient way is technical re-equipment and modernization of the operating enterprises, which can considerably effect resource-saving. In Kazakhstan, however, an insignificant portion of production capacities can become operational at the expense of modernization of the operating enterprises, according to statistical data. Modernization of operating enterprises is considered a strategic avenue for saving and attaining maximum resource-saving. Particular emphasis must be placed on the social effect of modernization. The modernization of existing enterprises and the introduction of resource-saving machinery improve working conditions, affect the place and role of a person in the production, and change the content and nature of labor. The attainment of a maximum savings of raw materials is closely connected with the simultaneous introduction of new machinery and the need to improve production technology. The scientific and technical revolution causes radical changes in labor tools, the subjects of labor and production technology. Efficient reconstruction of basic production assets on the basis of STP acceleration is impossible without fundamental technological changes.

Introduction of resource-saving technology makes the process of technical re-equipment of production more efficient. Calculations demonstrate that the period of repayment for advanced technology usually does not last more than 2 years (this is three times less than the repayment for the production mechanization). In the republic, however, the volume of capital investments in the introduction of resource-saving technology is quite limited, slightly more than 5% of the total sum of production investments in industry. This is half as much as the average level in the branch. The situation in Kazakhstan's metallurgical complex is somewhat better. Here the introduction of important scientific and technological advances provided for significant resource-saving. In 1990, an increase in the specific weight of resource-saving technologies in steelmaking made it possible to produce 4.6 million tons of steel, or 75.6% of the total volume of steelmaking, with the basic-oxygen process instead of open-hearth process. There have also been some changes in electric furnace steelmaking and continuous steelmaking.

Resource-saving production development on the basis of technical re-equipment necessitates a certain change in the relationship between the forms of machinery renovation. For example, a share of funds assigned to modernization must be increased from a third to at least a half of the total volume of capital

investments in production. We need to renovate production and introduce the most advanced machinery in the country and even in the world, which will yield the greatest economic and social effect. On average, the yield of capital investments in modernization is twice as high as the yield of capital investments in new construction. In spite of this, in Kazakhstan, three times more new equipment is directed to new constructions than to renovate production machinery of the existing enterprises. We recommend a large-scale economic program for shifting capital investments from new construction to technical re-equipment of existing enterprises.

It is also important to clearly determine the concept of modernization of the existing enterprises, as a material base for resource-saving. Scientists still disagree about this matter. We believe that as regards reconstruction, it will be correct to classify the types of technical re-equipment of production with the aim of resource-saving on the basis of the structure and functions of capital investments. For example, if works are carried out in an operating enterprise and the ratio between erection and equipment costs corresponds to new construction, these works cannot be classified as reconstruction. The reconstruction structure of state capital investments in production projects, taking into account the renovation of basic assets, serves to classify the technical re-equipment of an enterprise.

Economists suggest dividing the modernization of an enterprise into three categories: small-scale, average, and complete. In principle, we support this. We would like to note, however, that the coefficients of renovation of the active part of the basic production assets and the technological structure of capital investments can serve as a criterion for the division, rather than the coefficient of renovation of the basic assets. For example, the types of modernization can be described in the following way:

(1) **Small-scale modernization:** Only part of the active basic assets are renovated and modernized. The renovation coefficient is 0.1-0.2 and the coefficient of the technological structure of capital investments approaches unity.

(2) **Average modernization:** Besides a considerable renovation of an active part of the basic assets, this category includes certain works to modernize buildings and structures. Here the renovation coefficient is 0.2-0.4 and the coefficient of the technological structure of capital investments is about 0.8.

(3) **Complete modernization:** This includes renovation and modernization of the majority of the equipment, the introduction of resource-saving production technology, redesigning and expanding auxiliary shops, and

building new auxiliary projects. The renovation coefficient of an active part of the basic assets for this type of modernization must be at least 0.7-0.8, while an index of the capital investment structure must be equal or greater than a minimum specific weight of equipment costs, which classifies the given type of works as modernization.

Modernization of the operating enterprises is the most important material base for the strategy of resource-saving reconstruction. New construction also plays an important role here. Modernization of enterprises has certain drawbacks. A portion of old machinery remains at the enterprises, and specific costs are high.

The construction of new machinery projects introduces higher level production, which encourages a rational arrangement of production forces, the development of natural resources, and the optimal employment of labor resources. This helps greatly with the problem of regional economic development. New resource-saving equipment and technology projects are especially characteristic of the production branches, which primarily determine STP acceleration.

The resource-saving equipment (technology) is especially significant at newly constructed projects, since manufacturing a majority of new products is possible only with the help of modern materials and technology. In addition, often it is inefficient and or even impossible to use new resource-saving machinery and technology in conjunction with the old models. In light of this, to realize the resource-saving policy, a new building cannot be compared with the modernization of operating enterprises. A sound ratio between these approaches is necessary. No resource-saving method of production development can become a dogma. The methods must be in the optimum combination and be in line with the level of development of productive forces and production relations. In the future, a new technical modernization of the national economy must be realized and the material and technical base of the market model of economic management must be qualitatively transformed.

A specific feature of resource-saving production development on the basis of re-equipment is that this strategic avenue is not a temporary phenomenon, but one of the important forms of increasing the entire reconstruction process. Together with new construction, it must improve the volumes, structure and arrangement of production. Assigning the lion's share of capital investments to modernization and technical re-equipment of the operating enterprises will make it possible to significantly reduce structural and products costs. An example of

such an approach is the attempt to introduce resource-saving machinery (technology) for utilizing secondary ferrous metals at mini-plants in Kazakhstan. In order to increase the efficiency of scrap utilization, modern scrap-processing equipment must be repaid in 1-1.5 years; during the next 4-5 years, it contributes a certain profit to the national economy; after 5-7 years, the equipment must be replaced by new, more efficient equipment. At present, the maintenance of outdated and worn out equipment increases repair costs, causes more idle time than the plan allows, and reduces production efficiency. Due to a shortage of technical means, some scrap is sent to consumers in unprepared form, which causes considerable transportation expenses (5.71 ruble/ton as compared to an average of 2.49, and 0.93 in the Donetsk-Pridneprovsk region).

Technical development of the scrap-processing industry is closely connected with a change in the steelmaking structure according to means of production. By the year 2000, most steel will be produced in basic oxygen furnaces and electric furnaces. The piled density of scrap in loading capacities (charging boxes, trays, baskets) is planned to reach 1.8 t/m3 for open-hearth furnaces and basic oxygen furnaces, 2 t/m3 for electric furnaces (as compared to 0.7-1.3 t/m3 at present). Scrap for electric steelmaking production must meet stringent purity control (to be pure of nonmetal impurities and nonferrous metals).

For efficient use of scrap, released as a result of substituting basic oxygen production for open-hearth production, it is necessary to expand electrical steelmaking production. In this connection, a special kind of enterprise is gaining wide acceptance abroad: mini-plants. These conversion plants include electric-arc units, rolling mills, and continuous steelmaking plants. They offer certain basic advantages: they specialize in the production of various shapes of rolled metal, including small batches; they occupy a limited area; and they discharge fewer harmful substances into the atmosphere.

The wide-scale development of plants with limited capacities is due to the fact that many enterprises in different branches of the national economy need various product modifications. Thus, in the last 10-15 years, almost every branch of industry has an increased demand for special shapes of rolled metal. The volume of each type of rolled metal is insignificant; this is not a profitable endeavor for the large highly productive rolling mills, which operate efficiently only if one product is produced over a long period of time. In addition, small enterprises complement the large ones, and manufacture products that are not economically viable for large plants to produce. Small plants in some branches

(for example, in the metallurgical industry) have a number of advantages over large enterprises, such as a greater reduction of capital-intensiveness. Thus, the construction of large enterprises is a lengthy process, during which time considerable capital investments are frozen. Moreover, an increase in a unit capacity of aggregates and the integration of enterprises enhances their absolute cost.

Efficiency of mini-plants development is also determined by the fact that design and construction do not take long, the plants are flexible and able to cope with changing demands, the capital investments are lower, and the period of repayment is shorter. As experience demonstrates, the specific capital costs for a mini-plant amount to approximately 20% of the costs spent on constructing a general plant. These plants are built in 1.5-3 years. In addition, they occupy a geographical smaller area, have higher productivity and consume less metal. The capital intensiveness of the construction of metallurgical mini-plants is reduced thanks to the fact that modernized operating rolling mills of small and average productivity are used to produce small batches of rolled metal.

Mini-plants make it possible to unload some machine-building plants. For example, the Scientific Research Institute of Metallurgical Machine-Building (VNIImetmash) has created fundamentally new methods for shaping metals and aggregates. The method of continuous rolling can produce various articles, with parameters approaching the maximum capabilities of the machine-building parts. At present, rolling mills for producing these parts are used primarily at machine-building enterprises. At the same time, they can be considerably more efficient at metallurgical mini-plants, where the entire process (from scrap remelting to obtaining final products) can be continuous. At these mini-plants, it is expedient to institute continuous casting machines for horizontal-type blanks. Calculations show that a mini-plant working in producing components, with annual productivity of 250 thousand tons of liquid steel, will make it possible to save about 100 thousand tons of metal, to abandon 1400 units of press-forging and metallurgical equipment, and to release a thousand workers.

Mini-plants produce up to 10% of the world output of metal products. At the end of the 1980s, there were 274 mini-plants operating in capitalist and developing countries, including 47 in the United States , 27 in Japan, 37 in Italy, 5 in West Germany, 12 in Brazil, 13 in Mexico, and 14 in India (data compiled by the American firm, Paine Weber). In the former Soviet Union, only a few small plants have been built, located in Buelorussia, Moldavia, and the far east. The practice of designing and constructing small plants has demonstrated

different approaches to solving the same problem. For example, the Buelorussian metallurgical plant was designed and constructed by an Austrian firm together with 30 foreign firms and subcontractors. The most advanced and economical technological and building solutions have been selected.

Kazakhstan is a major consumer of metal products, primarily rolled and plate metal, pipes and metalware. In the future, the demand for these types of metal products will still increase in the region. Kazakhstan is short of 1.5-2.3 million tons of plate metal products and 3.0-3.2 million tons of section products. Proceeding from the prospects of nonferrous metallurgy development, a mini-plant of section specialization appears to be a good option. Economically, the Chiganak settlement in the Alma-Ata region is a possible location for a conversion plant (like that constructed in Buelorussia, Moldova, and the far east). There is a possibility of using the construction base of the South Kazakhstan hydroelectric station for building this plant. This station will be able to a provide power. To supply the conversion plant with gas, it will be necessary to build a 200-km-long tee from the Middle-Asia-Alma Ata pipeline. Scrap can be taken from the Zhambyl region. The region also has the necessary resources and the corresponding potential for producing high-grade rolled metal from alloy and low-alloy steel. The mini-plant can be incorporated into an electric steelmaking shop that has two electric furnaces with a 200-ton capacity, continuous steelmaking plants, a rolling-mill shop with medium-size and small mills, service shops, and a shop for slag processing.

Realization of different forms of production modernization, aimed at resource-saving, must be based on a scientific concept as a component part of the resource-saving strategy of national economic development. Here we must start from an analysis of the socioeconomic potentialities of the republic and its regions. The concept must be complex, relating basic directions of resource-saving production development in time and space, and reflecting progress in science and technology. It must take into account the development of production forces and radical changes in production relations. The program must be developed along both vertical and horizontal lines, in terms of interbranch connections. On the enterprise level, it must take into account refining production specialization, cooperative connections, and the introduction of new forms and methods of economic management with the transition to market relations.

We believe that the concept of resource-saving production development, based on production modernization must include two interconnected parts:

scientific/technical, and economic. This interrelationship is determined by the fact that the transformation of science into an immediate production force is, in essence, a socioeconomic process. The indicated parts of the program must be applied as the basic tools in planning and predicting the resource-saving strategy. Here it is important to substantiate an increase in the technical level of resource-saving production, which usually proceeds gradually at operating enterprises and takes a qualitative jump at new enterprises. Therefore, the given process must encompass the problems of radical change of organization of production and management, the mechanization and automation of labor, the introduction of advanced technical systems and production processes, and a radical change in the design properties of products.

The program of resource-saving production development by means of modernization takes place in both time and space. As regards time, we must analyze the results obtained in renovating production capacities (according to the terms of construction of the new equipment, modernization of the operating enterprises, and the period for developing the designed capacities) during the past, and also determine their future possibilities. As for space, the program must choose the location for the construction of new machinery projects, and select the enterprises that will be modernized, in keeping with the stages of the basic production, as well as the services provided. The volume of production modernization will be determined by the national economic demand for the given type of product and the balance of production capacities.

The principal requirement of the program is that the maximum socioeconomic effect has to be reached. Therefore, we should select the best alternatives, designed to achieve the highest results with the smallest capital investment in resource-saving machinery (technology). Another aim is to provide minimum production costs per unit of product upon its volume growth, as compared to basic assets and the number of workers, and to increase productivity rates as compared to production capital per labor. To express these basic economic requirements quantitatively, we want to reach or surpass the advanced indices (home, foreign, and theoretical) of resource-saving production development. The given indices must be supplemented by an appraisal of the influence of technical re-equipment on the environment, working conditions, and so on.

The predicted indices of resource-saving development by means of modernization must include the volume of products, the period of developing the production of new types of articles, profitability, product cost, specific capital

investments, period of repayment of capital investments, the number of workers, wage fund, production service, management expenses, basic assets, capital productivity, and the volume of cooperative deliveries. The program must also take into account indices for the most important products: output rates, capital intensiveness, material consumption, cost, profit, and specific expenses for production service and management.

Achievement of the maximum value of resource-saving on the basis of production modernization requires the corresponding substantiation of the given indices. This calculation should be carried out in the following order: choosing the basis for comparison; comparing these figures to the initial data (for example, product volume); and converting basic indices to the predicted volume of products to determine the value of one-time and current costs and economic effect. The principal difficulty is in unifying the data, since design employs different methods and estimates. Cost, capital investments, and transportation costs should be calculated using a unified methodology. The problems are complicated by factors of machinery obsolescence and unequal rates of scientific and technological progress. It is also obvious that the concept of resource-saving based on production modernization must reflect the financing of the corresponding measures with an indication of their internal sources, as well as different credits.

A complex technical and economic analysis must precede the development and substantiation of the processes of resource-saving production development through the most efficient forms of modernization. This analysis must be differentiated from an ordinary analysis of production and economic activity, which generally covers only a short period of time (usually a year) and is intended to estimate if the objectives of the plan were met and to discover available reserves. A complex technical and economic analysis of production, as the initial foundation for compiling plans and predictions of resource-saving extended reconstruction, encompasses a wide range of problems. This analysis must fully explore the technical and economic level according to the directions of production modernization, as well as principal indices, for both the preceding period, and the foreseeable future. It must establish the trends and regularities for developing resource-saving production and determine the potential for a wider application of the most promising achievements of science and technology aimed at a maximum saving.

The alternatives of the resource-saving production development program must gradually be improved by directed and self-supporting measures in the

scientific/technical and socioeconomic areas. To this end, the corresponding characteristics of the initial alternative, the limits of development, and a sound ratio between the growth rates of the principal indices in the branch, as well as limitations on resources, should be refined during implementation. At the same time new, more efficient, measures should be selected, and earlier measures should be replaced. Here all the indices must be correlated both for the branch and for individual enterprises.

It is especially important to take into account the interbranch structure of producing products (work, services) which greatly affects the final results of resource-saving. Thus, an average annual change in the branch structure of the national economy in the last five years caused an increase in material consumption of the social product by 1.2-1.5% or approximately 0.5 billion rubles. An analysis of the general figures of resource-saving illustrate that the planned branch structural changes in Kazakhstan's national economy do not always improve these figures, and can even lower them. Calculations show that the planned structural changes of the branches of national economy in 1990 increased the material and metal consumption of the social product by 4% and 6.3%, respectively. In view of the indicated drawbacks in planning production and using material and fuel-power resources, as well as the anticipated results of savings, by 1991 the material consumption of the republic's social product had fallen by 2.1%, and metal consumption had fallen by 5.6%. The influence of interbranch structural changes on resource-saving in 1986-1990 is demonstrated by Table 15.

Table 15

Dynamics of strategic indices of resource-saving in Kazakhstan, 1986-1990

Index	1986	1987	1988	1989	1990
Reduction of material consumption of gross social product by 1985, %	-1.1	+1.5	-0.3	-1.2	-2.1
Including:					
- interbranch structural changes	+1.7	+2.3	+1.2	+2.7	+2.8
- STP	-2.8	-0.8	-1.5	-3.9	-4.9

Table 15 (continuation)

Index	1986	1987	1988	1989	1990
Reduction of metal consumption of produced national income by 1985, %	+0.4	+2.1	+0.6	-0.6	-5.6
Including:					
- interbranch structural changes	+2.4	+4.0	+0.2	+6.2	+3.1
- STP	-2.0	-1.9	+0.4	-6.8	-8.7

Analysis of Table 15 demonstrates that promising scientific and technological achievements that were introduced into production have a positive effect on raw materials saving: The material consumption of the gross social product and the metal consumption of the produced national income are reduced. Interbranch structural changes also affect resource-saving. Therefore, in fine-tuning the concept of resource-saving production development, it is necessary to choose measures that will reduce and possibly eliminate the negative influence of interbranch structural changes.

The concept of resource-saving by modernizing the means of production reflects a global approach to development. Obviously, for this concept to be an efficient tool to scientifically control economic strategy, it should be refined in terms of specific features of separate branches and types of productions in the republic. Programs for the resource-saving development of production must be the initial base for developing the corresponding republic-wide program. We believe that this diverse program should begin with the joint development of economic and technical policy, based on predictions for the development of the science and technology; then it should deal with the coordination of plans for a period exceeding the traditional five-year period and further development and improvement of plan coordination, providing an efficient interrelationship between economic and scientific/technological cooperation; the third step is the development of unified specifications and standards, improvement of the system of price formation, and upgrading material responsibility and the reliability of warranties and sanctions.

An important aspect of the complex and pressing problem of developing a

program of resource-saving production development is the coordination of capital investments. It is necessary to create the best conditions for distributing capital investments between the branches and investing capital in other regions to create the maximum socioeconomic effect. This coordination will be reflected in scientific development and the correlation of branch, interbranch, and regional investment programs. This holds true primarily for resource-saving machinery and technology projects, whose products will be sold on the domestic and foreign market.

The development of a scientifically substantiated concept of resource-saving production development, based on modernization, requires the participation of all working collectives and individual workers. On the basis of this concept, each region will be able to independently select the most efficient alternatives for new construction, reconstruction, and extension of the operating enterprises, and determine the location and optimum dimensions of the projects being constructed or modernized. Starting from the program, we can make approximate calculations for individual enterprises and the branch as a whole, as well as expected capital investments, costs, and transportation costs to deliver the final products to consumers. This will enable Kazakhstan to institute a complex scientific and technological policy, aimed at the resource-saving development of the economy.

CHAPTER IX
RADICAL CHANGES IN THE ECONOMIC MECHANISM

Resource-saving strategy in Kazakhstan, as well as in the other CIS states, should be targeted by the inherent logic of the economic mechanism at achieving the highest efficiency. Consistent activities on material and fuel resource-saving are going on in the republic's economy. What positive outcome and practical experience do they hold? In the period of 1986-1990, 60% of the envisioned demand increase was met through the economy of rolled stock, cement, timber and thermal and electric power. Activities in the field of raw materials resources and power-saving have been advanced in quite a few sectors of the republic's economy. Positive results have been achieved by enterprises introducing new methods of economic management. A steady trend towards increasing the degree of secondary material resources utilization has taken shape. Nevertheless, material resources expenditure in the national economy exceeded 1.3 billion rubles.

Every possibility is to be used to solve the problem of consistent raw materials resource-saving. This requires a more active influence of the economic mechanism on resource-sparing economic development, beginning with reducing materials expenditure. Until now, there has been no efficient system of economic incentives for material resource-saving. Attempts to award bonuses for saving raw materials, electric power and fuel have not produced the anticipated results. In the long run, all complicated economic problems are faced with the objective necessity for a qualitative change of the economic mechanism as a whole, and its radical adjustment to the needs of further productive forces development, reproduction intensification and cutting resources expenditure per

unit of output.

The core of the economic mechanism under resource-saving strategy is scientific, technological and economic substantiation of the economy exercised through democratic methods. The economic management practice has proved that the directive targets mechanism fails to secure a necessary level of resource-saving. Therefore, considerable efforts had to be undertaken to establish competition and the relationships between producers and consumers on the market basis competition. These interrelations are to be based laterally on direct and individual orders by consumers, and vertically on state (governmental) orders. The system like this offers vast opportunities for exercising economic initiatives and creativity of mass population, considerably increasing the labor and social activity of working people in implementing resource-saving policy.

The optimum utilization of state orders in the resource-saving strategy of economic development is influenced by the fact that the modern stage of the strategy is characterized by the creation of market relations. Nowadays the society aggregate demand is displayed as state orders, direct orders by enterprises and institutions, and consumers' demand. Even the first stage of the transition to the market required a solution to the problem of expediency limits of state orders placement. It was revealed that at the present stage the state orders are not distributed, as a rule, on the basis of competition; the economic mechanism of responsibility sharing between suppliers and consumers hardly functions either laterally or vertically; and the percentage of state orders in the enterprises production program is too large.[2] The inventory of products ordered on behalf of the state sometimes includes products consumed only by the production sector itself. Being overloaded by state orders, the primary production capacities are unable to accept direct orders from consumers. The percentage of consumers' orders in the total output of the fuel complex was 2.8%; in the chemical complex, 6.4%; in the metallurgical complex, 7.9%, and in the machine-building complex, 8.4%. There are enterprises with no vacancies for consumers' orders whatsoever.

Enterprises' proposals about the possible share of state orders in the production program are from 20-80%, an extremely wide range. Everyone is

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1. This work uses the term "state order," which wssentially corresponds to the notion of "production output for state demands" which appears in official documents of the Republic of Kazakhstan and the Russian Federation.
2. See footnote 1, above.

agreed that with the transition to a market, the share of state orders would consistently decrease. The researchers are absolutely right in stating that neither singling out the most significant groups of products nor resources shortage can determine the reasonable percentage of state orders. The problem is to be faced by accounting for the development in the interrelationship between production and consumption in the system of extended reproduction, by exercising their balanced optimum coordination. [5]

The function of the output is of special importance. The defense industry and the consumer goods market have different and distinct needs. It is also essential to place the state orders at the enterprises involved in developing resource-sparing technologies and engineering, and to realize other general economic programs targeted at solving the problem of resource-saving. Thus, the enterprises of Subdivision I of social production have the necessary conditions for optimum utilization of state orders, and production capacities and national economic demands determine how many state orders there will be.

A social approach is no less important than an economic one in realizing resource-saving technology through scientifically-grounded placement of state orders. The orders may be expedient when they guarantee the welfare of certain strata of the population or national groups by providing them with special aid. With this relationship between production and consumption, the state would always be a customer responsible for realization of the product produced according to its orders (for example, means of production), and an end consumer will be represented by an enterprise or certain members of the society under the conditions of the variety of the forms of ownership.

The state order ought to be based on the principles of efficiency, priority, payment and profitability, i.e. it should correspond to market relations. It cannot be imposed on enterprises producing resource-saving equipment and technology by command voluntary methods. If the state order is a scientifically substantiated and economically grounded, it promotes the realization of resource-saving production strategy.

A state order is not the same as planned figures. To ensure resource-saving policy realization, strategical parameters of resource-saving should be taken into account. Now that stable trends towards regulating economic activities instead of directive orders have taken shape, it is possible, within certain limits, to control the economic strategy through the planned figures as well. To this end, it is expedient that these figures include generalized indicators of resource-saving - the materials capacity of the aggregate social product (or of the output for a sector

and an enterprise), and metal and power consumption of the national income (of the net output for a sector and an enterprise).

We hold that the economic mechanism should employ a generalized index of the resources utilization efficiency in the cost of production for planning and accounting purposes. This indicator must be adopted for the resource-saving strategy in Kazakhstan as well. The cost of production is one of the most important tools of the economic mechanism. It is actually the most direct and complete indicator of the efficiency of materials, raw materials, fuel, manpower and fiscal resources utilization. It is not distorted by the influence of nonproductive factors (exorbitant prices included). Applying the prime cost indicator is important both for developing advanced standards and as a beacon and assets forming criterion. It helps to establish the dependence of expenditure on output, to block an unjustified cost of production growth and, correspondingly, prices growth.

As one of the most important indicators of production and commercial activities, the cost of production reveals the resource-saving effect and exercises a stimulating influence on resource-saving production policy. A complete system of advanced standards is needed. The standards must be scientifically substantiated (i.e. developed on the basis of advanced technology, engineering and production organization potential), objective (reflecting economic processes, expenditure and outcome, without a distorting influence of nonproductive factors) and stable.

Existing standards and norms were developed with regard to production and organizational conditions at each enterprise (or group of enterprises), and find it advantageous to understate the basic level and conceal reserves. Sectorial standards, however, must be progressive. Every collective must have material incentives to seek the ways to more efficiently meet demand and advance in resource-saving. Until such standards are developed and widely adopted, the national economy will not be able to eliminate the expenditure-based mechanism influence, low efficiency, and unearned profits in production and trade.

A system of progressive long-term standards must fully characterize the production activity, the enterprise collective's commitments to the society and the distribution relationship between employees and collectives. Building this system requires the republic to undertake a series of measures: to determine the optimum standards which are necessary for efficient economic management under the transition to a market economy; to select objective indicators for developing standards which do not have the distorting influence of unproductive factors; to

substantiate methods of developing the quantitative level of standards which can ignore the attained economy level (with available losses and reserves) at a given enterprise while revealing and estimating the progressive quantity of the standards under conditions of modern technology and engineering within the resource-saving production. The system of progressive standards is widely adopted at in enterprises in the West and is a most important condition of economic utilization of production resources.

To meet these requirements for standards of the cost of production, substantiated methods of their development must be applied. The reference level method, design analytic method and experimental statistical method based on design data are among the methods usually applied. The reference level method, which lays down an established standard at the level achieved at by isolated enterprise (or at the sector average) in the reference (financial) year, is used most often. This method has been criticized for a number of years, because it aims the collectives at a level attained in the past which includes all losses and nonproductive expenditures. It does not allow for a more complete accounting of reserves when developing optimum plans for enterprises. However, it is still used, such as when developing normative standards for profit distribution.

A method of established cost of production, based on the statistical and design data of new engineering projects, is also used in practical activities aimed at resource-saving planning. The process of developing a standard employs data gathered over several years and data from new projects. While preserving most of the shortcomings of the reverence level method, this method is more complex but has not been widely adopted.

The normative standard for the cost of production used for resource-saving might be established on the basis of average socially necessary expenditure on output during a fiscal year. However, we should bear in mind that although the expenditure approaches the average level in a given sector, it can considerably deviate from the average. The point here is that socially necessary expenditure is determined per the whole output, taking into account its social usefulness which depends on the market demand for the given product. If the usefulness is insignificant, the production of the given product can be concentrated at a relatively small group of efficient enterprises with low expenditure. The converse is also true: A considerable increase in social demand requires that even the enterprises with high expenditure be involved in production. As a result, the socially necessary expenditure can be determined by groups of enterprises working under better, average, or even below average conditions. Thus, a

standard cost of production based on average socially necessary conditions of production is progressive for the enterprises lagging behind and regressive for advanced enterprises.

It appears expedient to alter the method to establish the cost of production standards and, correspondingly, the quota for prices, and to separate the established standards from the conservative criterion of the previously attained level, i.e. from the actual cost of production attained in the past (at an enterprise or in a sector as a whole) and to direct them at the optimum expenditure possible at the present stage of production development. We recommend the development of common long-term standards for a sector, based on the cost of production that must suit the conditions of modern resource-sparing technology (engineering) and the functioning and organization of production, excluding existing losses. This will make it possible to consider socially necessary expenditures for direct and materialized labor.

These standards would be progressive for every collective, would put the enterprises on a par irrespective of the level achieved and, given an appropriate system of incentives, would interest them in resource-saving implementation. In developing the standards, losses and reserves revealed at advanced enterprises that could be used when implementing modern resource-saving technology and the advanced organization of production would be deducted from the cost of production gained at these enterprises. These normative standards must be developed by employing analytical methods of design, on the basis of a comparative cost of production analysis for different enterprises and using the information supplied by advanced domestic and foreign enterprises.

Improving the economic resource-saving mechanism implies that incentives will play a larger role. [6] The improvement is integrally connected with the enhancement of economic accounting principles in resource-saving implementation and implies a personal interest in and responsibility for the quality and end results of the activities under resource-saving policy implementation. Self-financing is an objective economic category. Under conditions of the transition to a market economy, self-financing acquires new parameters and is rightfully called "commercial economic accounting." Its basic principles of profitability, self-repayment, self-financing, and economic interest in the end results are being developed further. In this case, we have every reason to call it total economic accounting. It can exist only at the basic level - at the enterprises which are commodity producers. The activity of the collective of the enterprise is embodied in the end product which is distributed and utilized within

the system of economic relations, market relations included. No other element of social production possesses these attributes and is directly connected with social output reproduction.

The transition to a market economy increases the significance of problems connected with different economic management models in ensuring the resource-saving strategy. The following economic management models differ in the way the collective appropriates the means of production and the principal features of the relations between the means of production and the collective: economic state accounting model, economic state-collective accounting model, contract, lease and joint stock, as well as mixed models, such as contract-joint-stock, lease-joint stock, etc. These models are not equally efficient. They differ in the way the production factors are connected, i.e. in the relationships between producers and the society as a whole and the producers' relations to each other as regards the appropriation of means of production and, correspondingly, the distribution of output.

Under an ever-increasing variety of modern forms and methods of economic management, it appears expedient to examine the functioning of the total economic accounting models as regards resource-saving. The first of the abovementioned forms is based on the normative profit distribution (net profit), while the second one is based on the normative gross revenue distribution.[3]

Under the first form, the gross profit is used as a basis for settling accounts with the state budget and other bodies, according to established quotas, paying the interest rate for the credit. The remaining part of the profit is at the enterprise's disposal and is used to form the incentive fund. Under the second form, the starting point is the gross revenue, what is left after a part of gain from the realized output has been used to refund materials expenditure. The gross revenue is used to settle accounts with the state budget and other bodies and repay the interest rate for credit. The remaining sum is the collective's profit and the incentive fund is formed on the basis of this. A single wages fund (instead of two separate wages and incentive funds) is formed as the remainder of the collective's profit.

The advantages and disadvantages of both models of economic accounting

3. This problem is still remains relevant at the present stage of the transition to the market economy, when a new taxation system has been implemented and the profit distribution system is being changed. The economic mechanism of the enterprises requires improvement.

have recently been the subject of a heated debate. The following discussion elaborates on these models in reference to the resource-saving problem in Kazakhstan. The first model is known to serve a stimulating function, because it guarantees interest in cutting the cost of production and in a reasonable utilization of resources. This eventually increases net profit and, as a consequence, increases the incentive fund. In addition, this model stimulates the enterprises to increase labor productivity because the sum saved as a result of the economy of the base wages fund through the reduction of the sound labor force remains at the disposal of the enterprise and can be used for awarding raises.

The model gives up the base increase method of base wages fund formation when a quota is used to estimate a fund increase (the base wages fund remains the same, providing that the volume of production is unchanged) and goes over to the formation of the total base wages fund according to an expenditure quota per ruble of realized net output, i.e. gross profit. The first model implies that the wages fund is being formed according to quotas in relation to volume indicators and appears to be an element of expenditure on production. However, though the increase based on wages fund formation was introduced to stimulate production growth, in practice it has done the opposite. As the quota was set at a low level (the average in the machine-building sector is 0.3), the enterprises avoided increasing the volume of production in order to maintain the base level of wages. The increased quota hindered the production of goods which the national economy especially needed. The only way for the enterprises to increase the wages fund without causing adverse effects was to inflate prices. This led to higher expenses for consumers and eventually to the destabilization of the market.

According to the scheme underlying the first model, allocations to the wages fund per ruble of surplus output are much lower than those planned. Thus, a planned fund is allocated per a planned volume of output, and the fund for surplus output is allocated with a correction factor of less than 1. This means that production of the surplus output is becoming less and less profitable, while there is a stable demand for many products which are sometimes in scarce supply.

As it was applied in practice, the first model did not help collectives to achieve good end results. The principal indicator for the enterprises has always been and will remain the indicator that determines the volume of the wages fund. Although gross income is widely criticized, it has remained vital because wages depend on it. In this respect, the second model ("What you have earned you will

get") appears preferable. One of the disadvantages of the first model was that it ignored resource-saving and frequently hindered the acceleration of scientific and technological progress. The implementation of resource-saving technology and engineering was unprofitable within the framework of the first model, especially due to the application of the increase-based quota of wages fund formation.

The second model does not have these disadvantages. To begin with, it implies a rigid linkage of pay to the end result, pushing the collective to increase profits, and employs resource-saving as well. The second model is advantageous because it ensures the collective's immediate interest in cutting material expenditure (the lower the expenditure, the higher the gross revenue) and resource-saving (the lower the payments for the resources involved, the higher the profit and, correspondingly, the wages fund). By establishing a rigid linkage between the gross revenue and the wages fund, the second model stimulates the growth of net output and labor productivity to a greater extent than does the first model.

From the point of view of resource-saving strategy, the advantages of the second model are beyond doubt. Under the first model, cutting production expenditure affects the profit only (and, correspondingly, the incentive fund), while under the second model it affects the whole wages fund (with the present correlation between the wages fund and the incentive fund in industry, expenditure cutting under the second model can ensure incentives 2-3 times as large as those under the first model). Incentives are produced by the logic of economic management itself, rather than by introducing a special system of bonuses, as in the first model. The first model establishes quotas for profit distribution and incentive fund formation so that at best only 40-50% of the savings can be allocated to bonuses.

It is preferable to use the second model for implementing the resource-saving strategy, despite its disadvantages and contradictions. The model creates incentives for saving activities. However, because this model is complicated only a few enterprises have adopted it. The introduction of the profit tax has additionally complicated the implementation of the gross revenue concept. However, the problem is still on the agenda and needs further examination.

What are the reasons for enterprises to delay instituting more efficient forms of economic management? The principal reason is a fear of drastic changes. Many managers and specialists are so accustomed to following obsolete instructions that they are neither able nor willing to commit themselves to new rights and obligations imposed by economic autonomy. Another reason

is that new methods of economic management involve certain risks for the collective, and people are inclined to first see how other enterprises fare. Thus, the improvement of existing relations of production did not ensure the desired change. The economic mechanism needs to be radically changed if we want to institute new forms of economic management when the market is put into place.

To establish market incentives for controlling the resource-saving process, it necessary to introduce a system of economic incentives for rational resources consumption, based on a radical improvement of the profit gaining and distribution mechanism which depends on resource-saving efficiency. To this end, different profit tax rates must be introduced, based on the actual decrease of output materials consumption through the acceleration of both scientific and technological progress and the implementation of advanced management methods. The pay fund should also be formed by taking into account a reduction in materials consumption and waste losses. To maintain the connection between resource-saving and its incentives, correction factors are to be introduced in accordance with the abovementioned conditions. In addition, to improve the product quality and cut waste losses, it is also expedient to apply correction factors to the profit level, which remains at the disposal of the enterprise and forms the incentive fund, depending on the correlation between actual losses and their established quota. These sums should be reserved and allocated to improving production quality.

Resources consumption growth without appropriate savings would inevitably lead to squandering resources. The underlying reason for this is that the economic mechanism is not yet targeted at attaining high eventual results with minimum expenditure, but at increasing profits and wages. Profits are the most important indicator of the collective's achievements. However, we have to ask whether this indicator might be used as a basis for a resource-saving model and, correspondingly, for time-saving, which is the principal law of economic progress. This question is extremely significant and deserves academic discussion. Our research has proved that the profit indicator does not fit the essence of economic methods to control resource-saving, as the standards based on it do little to stimulate the attainment of high eventual results. They make the enterprises fight to receive profitable orders, produce highly profitable goods, and raise prices.

Analysis shows that the profit level is often distorted by nonproductive factors (shifts in the inventory of the output and production pattern, price changes, etc.). Everything else being equal, the slightest change in the output

inventory might produce a considerable profit gain or loss. With the orientation to profit, only the different profitability of produced goods aggravates shortages and unmet consumer demand. The different profitability is not an incidental factor; it is objectively caused and is connected with different production patterns and, therefore, with the cost of production. If to add to this the emerging trend towards overpricing (of new products of the same quality, and of products realized at contract prices, etc.) the increased profit does not reflect the collective's achievements, but rather distorts them.

The economy is not indifferent to how the profit is gained. It may result from reducing the cost of production, overpricing, or cheap goods. Therefore, there is every reason to state that it is not expedient to use the profit indicator as the only criterion for estimating the eventual results of activities. We agree with those researchers who hold that expenditure-based production should be done away with directly (through rigid standardization and accounting for expenditures on specific goods production and their prime cost), rather than indirectly (using the criterion of profit alone). [7]

Will this important indicator consistently and objectively reflect the process of economy of resources? Generally speaking, it must serve as a strong incentive for resource-saving, and become an integral part of total economic accounting or commercial economic accounting. However, an alternative solution is possible: viewing the resources economy as the materialization of resource-saving. It means that only a part of the cost of production is taken as a basis for the resource-saving mechanism, namely, the economy, E, which is the difference between its standard level E and the actual factor E, i.e.

$$E_a = E_s - E$$

In this model, the correlations $E_s > 1$ and $E_s > E_a$ must apparently work.

The model reflects the actual economy of production and includes the effect of profit on expenditure increase. Whatever the economic mechanism is, it provides no opportunity to judge economic efficiency until we give up comparing its values embodied in the cost of production. Setting standards for a material resources economy would force the enterprises to cut expenditure, lower prices, implement resource-saving technologies (engineering), and more actively use scientific and technological achievements. Comparing E_s and E_a under

new conditions of economic management will yield a true volume of economy, the latter being the result of resource-saving. This value should be accepted as the most important indicator of the radically changing economic mechanism at the enterprises.

Application of the above model in economic management practice would provide prerequisites for the enterprises' interest in lowering release prices for resource-saving technology (engineering), for making the producer dependent on the consumer demand for his product and the consumer dependent on the product quality. Building a resource-saving economic mechanism which ensures economy of resources would require a rational sharing of its value between the enterprise and the state budget.

Credit has a significant influence on the realization of the resource-saving trend. Two characteristic features of the effect of credit on the resources economy should be noted. First, despite the fact that the credit allotted to enterprises is divided into long-term and short-term loans, as a whole credit plays an important role in increasing production efficiency, and therefore in implementing the policy of economy. Economy realization requires certain financial means to implement new engineering and resource-sparing technology that may not be available at the enterprise.

In addition, within the period of 1986-1990, Kazakhstan saw positive changes in the proportion of short-term and long-term credit, with a constant increase in the share of long-term credit. The two forms of credit should not be opposed to one other, but rather used in an optimum correlation to assist the realization of economy. Bank credit can affect resource-saving in various ways. Credit plays a particularly important role in implementing new resource-saving technology (engineering). In Kazakhstan this is utilized by every sector of material values production and especially by heavy industry, which receives 40% of all the loans granted.

Bank credit is turning into a powerful economic incentive for rapid and efficient measures of raw resources economy. Note, however, that not every problem of crediting capital expenditure on resource-saving production development has been solved. The significance of credit will keep increasing. Every loan should produce the planned results, but for various reasons, this is often not the case in practice. The enterprises that receive loans frequently do not receive new resource-saving technology on time, and contractors delay construction work. On the other hand, certain enterprises use bank loans to reconstruct several production facilities simultaneously. As a result, material and

money resources are dispersed and new buildings are not put into operation on time. Credit efficiency is to a great extent determined by a careful choice of objectives. Enterprises do not always use loans to implement the urgent and most efficient measures for raw resources economy.

To achieve greater economy, the validity of the recoupment estimates must be enhanced, including the return of short term credits granted for the purchase of new resource-saving technology. Some scholars propose estimating the recoupment time of total capital expenditure as its ratio to the difference between the annual volume of commercial output in terms of the enterprise's retail price and the production costs of commercial output. Repayment of the credit for capital expenditure is estimated differently. Here the profit is affected by accumulations liable to be withdrawn if the enterprise is new or expanding. Therefore, the credit repayment term can be expressed by an equation where the total credit is the numerator and the denominator is represented by the annual volume cost of additional commercial output in terms of current prices, minus the production cost of the annual volume of the additional commercial output and the accumulations liable to be withdrawn from an expanded enterprise. [8]

The models discussed above are insufficient. In the long run, the outcome of credit utilization for resource-sparing development of production depends on the implementation of new technologies (engineering) based on the advanced achievements of scientific and technological progress. Therefore, to characterize the effects of credit utilization, indicators must be introduced that reflect the social and economic consequences of the resource-saving policy and that employ the law of time-saving, namely a parameter such as the credit recoupment term (Table 16).

Table 16

Indicators and methods to estimate the efficiency of the resource-saving trend of production development

Efficiency indicator	Method of determination
Credit recoupment term, Tr	$Tr = \frac{Ka}{C1 - C2}$, where Ka is additional capital investments; C1 and C2 are the cost of production under compared resource-saving options
The effect of accelerating resource-efficiency; saving technology (engineering) implementation	$Ea = (Ts - Tp)EsTr$, where Ts and Tp are standard and planned terms of resource-saving technology (engineering) implementation; Es is a standard factor of relative Tr is the cost of implemented resource-saving (engineering)
Savings as a result of funds return growth following the transition to resource-saving production development, Et	$Et = \frac{K1 - K2}{(1 + Es)}$, where K1 and K2 are capital investments in compared options of resource-saving; (1 + Es) is a time period (years)
Effect of the sum total of capital investments in the regime of economy implementation, EK	$Ek = \frac{P - E}{F}$, where P is an annual output in terms of wholesale prices; E is materials expenditure; F is production funds

Table 16 (continuation)

Efficiency indicator	Method of determination
Profitability (efficiency) level, P	$P = \frac{I \times 100}{Cf}$, where I is the profit from output realization; Cf is the cost of basic production assets and turnover means
Labor productivity growth, B	B1 and B2 are levels of labor productivity preceding and following resource-saving technology (engineering) implementation

Application of the indicators in the table gives full play to the universal law of time economy, along with the increasing significance of the recoupment time of capital investments in resource-saving production development, and credit efficiency is expressed in labor productivity growth. Thus, an immediate correlation is established between credit recoupment time and labor productivity growth. The higher the labor productivity, the faster the credit recoupment, and vice versa.

To increase the significance of credit, the interest rate policy ought to be more active. The modern concept of the interest rate policy practiced by the State Bank is forced to take into account inflation and the difficult financial situation in this country: the state budget deficit and overseas debt growth; abundant currency in the payment turnover; and an acute shortage of practically all kinds of resources. Under these conditions, the development of market relations and the expansion of decentralized financial and material values may cause a keen demand for credit, and an interest rate policy must oppose this trend. The availability of bank credit considerably affects its function as an incentive for raw materials economy. Credit is a special form of the national income redistribution, based on reimbursement with interest. The interest is a part of the net income of the enterprise or state.

Some scholars maintain that interest expresses the credit price. They are critical of the view that interest is a part of the enterprise's net income and

disagree with the opinion that interest is an autonomous economic category of surplus product cost redistribution which is important for economic accounting. [9] Indeed, interest is linked with credit movement and cannot function by itself. Interest performs specific economic functions, along with such factors as profitability, profit, credit, etc. It is like a price for credit, though its level may vary, affecting the demand for credit. The interest rate depends on the purpose and terms of the credit, as well as its sum. Therefore, interest becomes an economic incentive in making the enterprises use the means involved in the turnover more efficiently. At the same time, interest must not be identified with a purely accounting value called the interest rate.

The interest rate for the credit targeted at resource-saving development of production must be scientifically grounded. The interest rate policy fulfills this purpose only when it ensures steady economic growth and the stable purchasing power of the ruble at domestic and overseas markets. To solve this problem, it is necessary to first create a system of interest rates that would stimulate the rational utilization of credit in the national economy and reduce inefficient and useless expenditure. Secondly, Kazakhstan needs to use direct methods to influence the interest rate until adequate short-term and long-term credit markets and securities take shape. A third requirement is to proceed from the stimulating function of the credit when specifying the interest. If all the spare currency resources are redistributed through credit, the interest participates in net income redistribution and therefore is repaid from the profit. A particular interest rate for a credit should also be linked with the standard efficiency of expenditure in the national economy as a whole, taking into account the loan distribution among the sectors. Thus, in Kazakhstan, industrial profitability is 9.5%; profitability in the oil industry is 12.7%; in light industry, 21.7%; in the gas industry 3.4%, and so on.

There is also a problem of designing an interest rate policy that accounts for a particular sector. This can be approached in the following way. The bank credit rate must not be set higher than the efficiency standard for the given sector (in relation to production assets). If, for example, the bank credit rate is set at 22%, this will lead to a complete withdrawal of the profit from the loans, and the enterprises would not be interested in using the credits to develop resource-saving production. Therefore, the maximum interest rate must be high enough for the average efficiency of expenditure in national economy, while the minimum level should be affected by socially necessary bank expenses. This is the way bank interest is structured under more or less stable economic conditions

[10]. With inflation, banks set higher interest rates to slow down inflation and to restrict employers from using credit to pay wages.

With inflation, an interest policy with differentiating interest rates may also promote agricultural advances, an increase in consumer goods output and resource-saving, ensuring market normalization in the long run. Under present economic crisis conditions, interest rates must be differentiated. Preferential rates should be granted in cases where the enterprise is efficient and provides rapid recoupment. Conversely, the rate must be increased if the enterprise falls behind schedule.

The loans should not be granted for an establishment but to a particular borrower implementing resource-saving technology (engineering) and must be tailored to his demand and his capability to repay the loan and keeping to the credit terms. With the development of market relations, the credit and securities market and bank competition, direct methods of administrative control over the interest rate would become an obstacle to a free resources exchange and, consequently, to progressive changes in the economy. Under these conditions, direct methods must give way to indirect ones. The official interest rate should be linked with supply and demand of credit resources. Proceeding from economic and monetary and credit policy, the rate must be specified through the system of bonuses and discounts applied to spontaneous rates of the monetary and credit markets. Through this, the credit policy of the central bank would influence the interest rate at the commercial banks to move in the desired direction.

Thus, the strategic trends of economic resource-saving development are actually a new system of economic management which involves priority technology, engineering, the introduction of different forms of property and methods of efficient production organization, the intensification of economic reform, the development of market relations, a drastic increase in economic autonomy and responsibility, and involving enterprises, regions and republics (states) in mutually advantageous economic cooperation.

SECTION IV
LONG-TERM PROGRAM OF OPTIMUM RESOURCES CONSUMPTION

CHAPTER X
PROGRESSIVE CHANGES IN THE RESOURCE-SAVING PROCESS

The efficiency of the resource-saving process depends largely on knowledge of the actual economic regularities of production. Like any other social process, resource-saving is controlled and self-controlled under market economy conditions. A comprehensive study of the actual processes of economic life is the only way to reveal the economic laws that govern these processes and to discover the inner connections between the laws which make up a system.

This approach enables us to study the interrelationships between economic laws, and how they function in the area of resource-saving. In doing so, we should not examine each economic law in isolation from the others; this would isolate them from the production process they manifest. The same approach should be applied to revealing regularities of the resource-saving processes. Let us first concentrate on the most important element: the effect of resource-saving dynamics on materials consumption of the gross national product. There are different points of opinion about this issue. Some scholars point out that during the last twenty-five years, the share of materials expenditure in the social product has been steadily increasing from (53.9 to 59.1%). In the future, the acceleration of social production growth due to scientific and technical progress will be related to an increasing share of the recovery fund in the aggregate social product. [1]

Materials consumption of the gross national product is increasing, i.e. a share of materials expenditure in it is increasing. Naturally, the share of

past labor in the product cost is increasing faster than that of the direct labor. It is an inherent feature of social production development. [2]

A number of scholars concur with this opinion. [3] Other researchers are not as confident that an increase in the share of materials expenditure in the product cost is a regularity of social production development. We maintain that at a certain stage of economic development, the share of materials expenditure can be decreasing due to materials and energy-saving scientific and technological progress. We should differentiate between materials-consuming and materials-saving formation of the aggregate social product, this differentiation depending on relative expenditures for material resource-saving. As the materials-saving economy reflects new opportunities, it can be seen as a natural tendency in the extended production process. In actual extended reproduction, a number of objective relations exist between the aggregate social product and materials consumption. Some are described below.

1. The materials consumption (MC) rate of the gross national product (GNP) is stable.

$$\left(\frac{MC}{GNP}\right)_t = \left(\frac{MC}{GNP}\right)_{t+n}$$

It can be achieved under steady growth of the gross national product

$$\left(\frac{\Delta GNP}{GNP}\right)_t = \left(\frac{\Delta GNP}{GNP}\right)_{t+n}$$

and an invariable percentage of materials consumption.

$$\left(\frac{\Delta MC}{GNP}\right)_t = \left(\frac{\Delta MC}{GNP}\right)_{t+n}$$

2. The materials consumption of the gross national product is increasing

$$\left(\frac{MC}{GNP}\right)_{t+n} > \left(\frac{MC}{GNP}\right)_t$$

with the stable growth of the gross national product

$$\left(\frac{\Delta GNP}{GNP}\right)_{t+n} = \left(\frac{\Delta GNP}{GNP}\right)_t$$

and an increasing rate of materials consumption.

$$\left(\frac{\Delta MC}{MC}\right)_{t+n} > \left(\frac{\Delta MC}{MC}\right)_t$$

Under these conditions, the rates of materials consumption growth may be same.

3. The materials capacity of the gross national product will decrease

$$\left(\frac{MC}{GNP}\right)_{t+n} < \left(\frac{MC}{GNP}\right)_t$$

under increasing rate of national product growth

$$\left(\frac{\Delta GNP}{GNP}\right)_{t+n} > \left(\frac{\Delta GNP}{GNP}\right)_t$$

both under a steady rate of materials consumption growth

$$\left(\frac{\Delta MC}{MC}\right)_{t+n} = \left(\frac{\Delta MC}{MC}\right)_t$$

and under a slowing growth rate.

$$\left(\frac{\Delta MC}{MC}\right)_{t+n} < \left(\frac{\Delta MC}{MC}\right)_t$$

4. There is a clear tendency of the national product materials consumption to decrease

$$\left(\frac{MC}{GNP}\right)_{t+n} < \left(\frac{MC}{GNP}\right)_t$$

when the growth rate of the gross national product is higher than that of materials consumption, i.e.

$$\left(\frac{\Delta GNP}{GNP}\right)_{t+n} > \left(\frac{\Delta GNP}{GNP}\right)_{t} > \left(\frac{\Delta MC}{MC}\right)_{t+n} > \left(\frac{\Delta MC}{MC}\right)_{t}$$

The optimum variant of long-term strategy of material resource-saving appears to be necessarily characterized by lowering or, at least, stabilizing the materials consumption of the gross national product. All this will depend on actual conditions, the productive forces development level, national economy reserves, and potential at a certain predicted period. As a result, materials consumption of the gross national product will be possible to predict using the following model:

$$MC_{t+n} = \left(\frac{MC}{GNP}\right)_{t+n} GNP_{t+n}$$

The resulting tendency of the material resource-saving (especially when it is caused by the system of economic laws) is the social orientation of resource-saving policy. Table 17 shows the specific manifestations of this process.

Table 17

Dynamics of indicators characterizing the social orientation of Kazakhstan's economy, %

Indicator	1985	1990
Percentage of resources for routine consumption and non-productive construction in the national income	77.1	82.8
Percentage of Group B products in the total volume of industrial output	24.4	27.3
Percentage of capital investments in the non-productive sphere in the total amount of investments	27.3	39.3

Table 17 shows the increasingly social orientation of the Kazakhstan economy. In 1990, 82.2% of the national income used for consumption and accumulation was allotted to social programs, as compared to 77% in 1985. The real per capita income during that five-year period increased by 11.3%, and payments and benefits from social consumption funds increased by 22.1% as compared to 10.1 and 18.6%, respectively, which is in keeping with targets set out by the five-year plan. The stable tendency for priority development of the production of articles of consumption against the production of means of production has taken shape. In the latest five-year period, the rate of increase of Group B output topped that of Group A output by a factor of two. In 1990, total output of industrial goods exceeded the five-year plan targets by 21.6%.

Specific directions of social restructuring in Kazakhstan have become possible as a result of the new economic policy, and the changed correlation between accumulation and consumption, which results in enhancing the effects of the economic laws. For example, the consumed national income per capita increased during the 1986-1990 period from 1916 to 2029 rubles. The objective economic laws, which express the essence of the most important aspects of relations of production, acquire their inherent content and qualitative characteristics in the process of resource-saving. It is important to study the way the changes in correlation of Subdivisions I and II of national production affect the realization of resource-saving policy. (The correlation between Subdivisions I and II is a hotly debated issue in contemporary economic theory and practice.) We should also bear in mind that the formation of Subdivisions I and II output is affected by quantitative and qualitative economic properties, and by the level of assets and resources consumption under production conditions.

Is there any reason to believe that the higher rate of Subdivision I development is still a natural regularity for extended reproduction? This question defies a definite answer because it requires us to examine a number of objective circumstances. It is also necessary to take into account the existing feedback. The correlation between Subdivisions I and II as a certain natural indicator of extended production affects the dynamics of materials consumption, and vice versa. For example, a change in materials consumption definitely influences the correlation of Subdivisions I and II of the social production.

The interrelationship between materials consumption and the correlation of Subdivisions I and II is displayed by two trends. The first trend can be regarded as a result of improved usage of floating capital, which leads to a decrease in materials consumption, as well as a decrease in the demand for Subdivision I

output and, consequently, to converging the growth rates of both subdivisions. Decreasing materials consumption of production is the prerequisite for converging the growth rates of Subdivisions I and II of the social production and for stabilizing the share of means of production in the aggregate social product. This could be explained by the fact that an increase in efficiency and a better use of means of production will decrease materials consumption per unit of output and the national economic demand for Subdivision I output. These factors provide for the acceleration of Subdivision II growth. Thus, materials consumption, assets consumption of the national output, the rate of economic development, and changes in the share of accumulation in national income are some of the basic factors affecting the correlation between Subdivisions I and II.

The feedback appears to be the second trend in the effect of materials consumption on the correlation between Subdivisions I and II. The essence of the trend is the way in which Subdivision I affects the decrease of materials consumption. The development and higher growth of Subdivision I are vital to the implementation of production modernization and to fully equipping it with materials-saving means of production. Subdivision I is a material basis for increasing the efficiency of social production and decreasing the materials consumption of the gross product. This implies that Subdivision I development is the basis for converging growth rates of both subdivisions, ensuring all-embracing resource-saving. Thus, the formation of Subdivisions I and II output is strongly affected by quantitative and qualitative indicators of resource consumption during production.

Under present conditions, we see a comprehensive modification of all correlations in the national economy, including Subdivisions I and II dynamics based on materials consumption of the gross national product. Therefore, it is essential to reveal the effect of their regularities on the savings process. However, various research efforts have not been able to clearly define this problem. There is a difference of opinion about the regularities of comparative dynamics of Subdivisions I and II and, consequently, the dynamics of materials consumption. A number of researchers maintain that not only the convergence of growth rates of both subdivisions, but also the faster growth of Subdivision II, are inherent features of social production at the intensification stage. They see no justification to the attempts to specify a priori a faster rate of growth without considering the peculiarities of the particular stage of the social production development. They are critical of the researchers who regard the faster rate of growth of Subdivision I as the basic postulate for which they seek theoretical

justification instead of inferring an appropriate actual correlation between Subdivisions I and II, based on an analysis of social, economic and technological processes [4] affecting the correlation.

A number of scholars emphasize the necessity to stress the qualitative, instead of the quantitative, aspects of the law of priority development of Subdivision I, these qualitative aspects being the technological and economic level of means of production and their ability to solve the problems of social production. The transition to intensive economic growth is characterized by the further increase in Subdivision I growth. The level of priority may decrease slightly in the future, but it cannot abandoned, as this would hinder the solution of technological and social problems of economy intensification. A move to discard "the law of the predominant growth of Subdivision I by no means contributes to the technological re-equipment of the national economy, and hinders laying a powerful production basis for producing consumption goods." [6] However, one may come across allegations stating that under present conditions the predominant development of production of means of production as a prerequisite of extended reproduction is no longer valid. This statement, being true for the period of the formation of the industrial foundation, is invalid under present conditions after the foundation has been laid. [7]

The contradictions in treating the regularities of the comparative dynamics of Subdivisions I and II appear to be a result of applying the problem to the process of economic development in general. This approach ignores the present stage of scientific and technological progress, the transition to a market economy, and the social orientation of the national economy. What are some relevant facts? During a period of about 20 years, the correlation between Groups A and B remained quite stable, with annual insignificant fluctuations. The percentage of Group A remained stable at about 74.2%. The year 1985 saw a marked rise in this percentage (up to 75.6%). To a large extent, this was a result of a simultaneous wide-scale revision of wholesale prices of means of production, i.e. growth did not keep pace with actual changes in production.

Evidently, past correlations cannot be applied unconditionally to subsequent changes. The policy of saving raw materials, which amounted to 59.7% of Kazakhstan's gross national product in the twelfth five-year period, requires a new approach to establishing the correlation between the growth rates of Subdivisions I and II. According to world statistics, in industrial countries the average share of Subdivision I, with a stable correlation between subdivisions, is 61-62%, i.e. two-thirds of the resources and national product. The only

exceptions to this were the former Soviet Union and Romania, where the share of Group A approached 75%. This casts doubt on the law of predominant growth of production of means of production and the negation of the tendency towards the convergence of the subdivisions growth rates. As to their dynamic equilibrium, scientists generally reject even an assumption of its regular character.

The following options are possible when modelling the development of Groups A and B: Group A growth is outrunning that of Group B; Groups A and B have the same growth rates; Group B is developing faster than Group A. To choose an optimum option for a particular stage of economic development (resource-saving type of production), it is necessary to carry out a comprehensive analysis of the factors affecting the development of Groups A and B. The complete levelling of the subdivisions growth rates at a particular stage of development should be regarded as a natural phenomenon. For a long time, the priority development of Subdivision I has been interpreted as an inevitable projection of the objective process of the production inherent pattern growth on the social production pattern. The argument was based on a well-known thesis expressed by Lenin. [8] However, this thesis did not consider the fact that the growth of the production inherent pattern manifests itself as a complex controversial tendency which is affected by a number of impeding or modifying factors (e.g. the priority growth of labor productivity and, consequently, the decrease of the product cost) in the production of resource-saving machinery and equipment, raw materials, and by the activation of factors increasing labor costs, and so on. [9]

Examination of the extended reproduction process shows that, under present conditions with the growing significance of economic social orientation, neither priority development of Subdivision I as opposed to Subdivision II, nor priority development of the sectors of industrial Group A as opposed to Group B, as a special case of the former correlation, might be generalized or regarded as an axiom. The scientific approach to the problem of two subdivisions should not be inferred a priori from the inevitability of this priority now and in the future. This matter requires a creative approach based on a careful judgement of the total complex of factors promoting both priority growth of Subdivision I and the convergence of the growth rates of both subdivisions. It is also necessary to clearly differentiate between short-term and long-term aspects of the comparative dynamics of the social production of Subdivisions I and II. Here we must consider the transition of the national economy to a qualitatively new model of

economic growth, based on the priority development of non-productive spheres. This model envisions stabilization and a subsequent considerable reduction in the labor force in the sphere of material values production.

Predictions show that by the year 2000, the number of people employed in material values production in the former Soviet states will have decreased by approximately 16 million as compared to 1985, and the number of people employed in the non-productive sphere will have increased by 20 million. As a result, the percentage of people employed in the non-productive sphere will have increased from 26.7% in 1985 to 35-37% in 2000.

With the transition to the market model of economic growth, the problem of developing the material and technological foundation of the non-productive sphere and providing the required number of jobs becomes preeminent. At present, the assets availability for labor in the non-productive sphere is about 60% of that in the material values production sphere. This means that the quality of labor in the non-productive sphere, and especially in the sphere of consumers services, is much lower in all respects, as compared to the material values production.

Should the situation remain unchanged, this would become a serious obstacle to the transition to market structures. At the same time, it is necessary to modernize the material and technological foundation of the material values production, to develop its resource-saving trends. The productive base of Kazakhstan is in dire need of renewal. However, raising the yearly rate of basic production assets replacement (which can reach 10-12% in mechanical engineering sectors) will inevitably lead to a situation in which stabilizing or even increasing assets efficiency will for a certain period of time be accompanied by a decrease of the used assets efficiency, the latter being the key factor in establishing the national economic demand for Subdivision I output.

An increased rate of production (by approximately a factor of 1.5) of means of production will be required to speed up the replacement of obsolete machinery under the optimum growth rate. This presupposes a considerable increase in the demand for means of production, first and foremost from machine-building enterprises. Under present conditions, this would be a strong incentive for optimum growth of national production based on resource-saving economic development. For a certain period of time, the dominant role will still belong to the factors connected to a dramatic increase in the national demand for modern means of labor to save material resources.

Realization of the resource-saving policy as a result of application of a

certain correlation of Subdivisions I and II development acquired another form at the new stage of societal development that manifests itself as a correlation between the means of labor and objects of labor in Group A. The trend of materials-saving development of Subdivision I will become apparent in a gap between the growth rates of production of means of labor and objects of labor. This is a natural phenomenon under savings policy and the resource-saving trend of production development. For example, in the 1970s and 80s, the average annual increase of production of means of labor (in stable prices) was 7.7% and that of subjects of labor 4.7%. To intensify the effect of the resource-saving strategy and realize the radical modernization of the national economy, it appears expedient to further increase the share of production of means of labor in Subdivision I output instead of increasing the latter's share in the aggregate social product.

The priority growth of production of means of labor will promote the resource-saving trend of industrial development by implementing the most advanced achievements of scientific and technological progress, a new quality of economic growth and an increase in the standard of living. These correlations are supposed to first affect the comparative dynamics of Groups A and B sectors. At present Group A's share is about 20% of the total cost of produced means of labor. This share would markedly increase with an increase in capital investments in national production restructuring. A rapid growth in the public demand for modern resource-saving technology, for modernizing the industry under a relative savings of subjects of labor and a continuous increase in the significance of industrially produced commodities make the industrial production pattern more flexible and mobile as compared to the pattern of the social product as a whole.

These circumstances provide an opportunity to gradually relinquish that economic trend when the priority growth of Subdivision I is accompanied by the priority growth of Group A sectors. It should also be noted that under certain priority growth of Subdivision I or the same growth rates of both subdivisions, there will be a steady priority growth of Group B sectors. This correlation would apparently be typical of the transition to a predominantly intensive type of extended reproduction in a market economy based on a considerable savings of direct and materialized labor in all possible forms. All this will pave the way for a simultaneous priority growth of both Group B sectors and Subdivision II of social production. The predicted changes in the structure of the aggregate product and industrial sectors output imply that an application of these

predictions in a practical control of the resource-saving process lends a special significance, both for economic theory and practical activities, to studying the quantitative aspects of the development of means of production which will soon determine the tendencies and contradictions in Subdivision I of the social production.

In conclusion, to solve the radical problem of economic policy in the near future, we should change the Subdivision I pattern by increasing the share of subdivision "I for II" and, consequently, to reduce the share of production of means of production for Subdivision I. This will undoubtedly transform the priority growth of Subdivision I as one of the production laws of a certain period of the intensification process, into another law - a priority growth of the production of means of labor. [10]

A qualitative aspect of subdivisions correlation is also important for implementing resource-saving policy. Therefore, a proposed mathematical model [11] of commodities production based on the dynamic equilibrium of Subdivisions I and II is of interest:

$$P = 2W \times E \times E$$

where P = the volume of production of consumer goods; W = the number of employees in social production; and E = the percentage of people employed in subdivision II. E is interpreted in two ways: as a percentage of people employed in Subdivision I and as an index of assets availability and labor productivity. The maximum volume of production of consumer goods can be determined by predicting P according to the refined model and taking into account the actual situation. According to analytical predictions, the maximum volume of consumer goods corresponds to the value of E in the range of 56-66%.

The above analysis proves the existence of an objective range of subdivisions with variations in their dynamic balance. Predicted limits of allowable variations of subdivisions shares under their relative stability seems to correspond to their variation range observed in real conditions. This range actually defines the optimum correlation of subdivisions I and II. It corresponds to the maximum production of consumer goods per capita. It implies that it is the optimum correlation of the subdivisions that makes up the objectively existing inherent limit which acts as a law determining the necessity of convergence and reaching a plateau of subdivisions growth rates with the industrial development of society. When this plateau is reached, the subdivisions inevitably come into

the condition of dynamic equilibrium.

This interpretation of changes in the dynamics of the subdivision complies with the scientifically-grounded methodology of research and solves the most important problems posed by actual practice. It is especially important because the predominantly extensive growth based on the priority development of the production of means of production and involving more of the labor force and more material resources in production has caused a deceleration in growth rates and a decrease in national production efficiency. However, implementation of the resource-saving economy needs a concrete definition. It is necessary to know the optimum structure of production of means of production (Group A), i.e. the share of means of labor and subjects of labor. To provide the efficiency of resource-saving, a minimum share of subjects of labor in the production of means of production should be used under the corresponding increase of the share of means of labor. An objective character of the economic development under the transition to market economy will be taken into account, manifesting itself in the necessity to increase the share of the production of means of labor in the form of resource-saving technology.

We propose to solve the problem of designing a model for optimum resource-saving, embracing regularities of reproduction in the correlation dynamics of Subdivisions I and II, by considering both beneficial and non-beneficial factors. They are the following. The factor controlling the growth proportions of both subdivisions of national production manifests itself through changes in the assets possessed and capital consumption in the process of production. The growth of assets possessed for labor is a factor that increases labor productivity and promotes the priority growth of Subdivision I. On the other hand, the priority growth of labor productivity as compared to an increase of assets possessed decreases assets consumption of the production process and may objectively decelerate the growth rate of Subdivision I as compared to that of Subdivision II. The converse is also true: Labor productivity lagging behind the growth in assets possessed, along with an increase in the economic development rate, leads to a predominant growth of Subdivision I of the social production. At the same time, an acceleration of scientific and technological progress, an increase of the means of production utilization efficiency, and a savings of means of production, which make it possible to reduce assets and materials consumption, serve as counteracting factors.

While assets and materials consumption are very important as the factors affecting the correlation of Subdivisions I and II, they should not be substituted

for the parameter characterizing the inherent structure of the assets (the assets availability for the direct labor). This parameter should be regarded as a very important factor in the growth rate of both subdivisions. It is largely determined by the changes in assets and materials consumption and manifests itself through the dynamics of assets availability and the rate of accumulation.[1] For example, assets and materials consumption reduction implies an increase in the utilization efficiency of the means of production. This limits the increase in the availability cost of assets and is equivalent to the growth rate decrease in the inherent structure of the assets, promoting the convergence of the growth rate of Subdivisions I and II. An increase or stability in the rate of accumulation caused by a reduction of assets and materials consumption has the same effect.

Another important regularity of the extended reproduction that forms a strategy of raw material-saving is determined by the law of accumulation. This law defines the objective necessity of optimum accumulation and utilization of a certain percentage of the national income to continuously extend and quantitatively advance production and to increase the national wealth of the society. Accumulation is one of the most important strategic indicators of extended reproduction.[2] Therefore, it plays an extremely important role in the implementation of resource-saving policy. The society is able to develop its economy only when it is constantly accumulating a part of its surplus product and uses it to extend production.

There is no doubt that the accumulation process has a universal and regular character. Under resource-saving conditions, the law of accumulation manifests itself through the optimum rate of accumulation (the ratio of accumulated surplus product and the national income). For the strategy of resource-saving, a rational rate of accumulation could be defined from the following. For every predicted period, the rate of accumulation must provide for the greatest increase in public consumption, simultaneously creating the prerequisites for a more dynamic growth of production and consumption in the future. Proceeding from this, we could establish minimum and maximum values of the rate of accumulation. Minimum accumulation is determined by the cost of extended reproduction of manpower. It is necessary to secure jobs for new generations of employees released as a result of scientific and technological progress. Actually, this line

1. The share of the sum total of the basic industrial assets and the increase of working capital and reserves in the national income.
2. These problems are discussed in detail in Section 2.

runs slightly above that limit. The maximum accumulation is basically the surplus product. It means that the upper limit of accumulation is determined by consumption fund growth with the population growth. Actually the accumulation curve is considerably below that limit. These correlations are dictated by the fact that both the accumulation and its structure are determined by the condition and development of productive forces and production efficiency.

In actual economic life, the optimum rate of accumulation is formed in accordance with the peculiarities of a given stage of social and economic development. In Japan, for example, the rate of accumulation is higher than in the United States by a factor of 1.5, this being the reason for its higher rate of economic growth. In the future, the correlation between the accumulation fund and assets consumption in the national income will constantly be changing. Thus, four decisive factors should be singled out when analyzing the problem of the optimum pattern of the social production: the growth of the organic structure of assets (changes in assets possessed for labor); the rate of production accumulation; assets consumption of the output; and the output materials consumption. Investigation of economic regularities of the resource-saving process development and optimum resources consumption is a complex union of theory and practice. This union involves qualitative technological changes in every phase of production with the priority of social interests and market demands and creating a production mechanism that will ensure the highest growth of welfare through incentives and sanctions. We need a new national scientific and technological policy for innovations: organizing and stimulating a market of scientific and technological products and the services of a network of innovation banks, stock exchanges, technological parks, commercial organizations, engineering companies, etc. This is designed to place scientific and technological progress within the market economy. To this end, a long-term program of optimum resources consumption should be implemented through a comprehensive study of new trends of resource-saving on the basis of a theoretical analysis.

CHAPTER XI
PROSPECTS FOR DEVELOPMENT AND RESOURCE-SAVING IN KAZAKHSTAN

The optimum development of the economy of Kazakhstan requires profound social re-orientation. This necessitates a transition to a new market model of social and economic development of Kazakhstan as a sovereign state. To this end, it is essential to analyze the reasons for the severe economic crisis and to search for a solution to the situation. First of all, it is vital to outline the prospects of productive forces development and to discover the key indicators of the national economy. We believe positive results will arise from combining new forms of economic activities with an acceleration of scientific and technological progress and resource-saving production development. However, the decisions taken should not exceed Kazakhstan's real potential and should meet scientific requirements and focus on the most efficient economic development.

In Kazakhstan, the starting point for a transition to a new model of social and economic development is characterized by contradictory trends. The national production efficiency is still low and the rate of accumulation in the national income is considerable (1985 - 26.2% as compared to 24.8% in the former Soviet Union as a whole). The turnover tax accounted for about 31% of the republic's national income, with only 14% of the income being formed by the payments assigned from the profits of national enterprises. An insufficiently profitable pattern of national production has taken shape in the republic. The low profitability of production as a whole was caused by a large share of mining and agriculture in the aggregate social product and high capital consumption. The

prices of agricultural products and mineral raw materials did not compensate for the expenditure of labor which made the economic conditions in Kazakhstan worse than that of other regions.

In most significant indicators of social development and the standard of living, the republic has been lagging behind the average figures for the former Soviet Union, and occupies eighth to twelfth place. The social and economic situation in Kazakhstan called for taking radical steps towards improving economic conditions, cutting the budget deficit, and promoting qualitative restructuring. Social and economic targets at the present stage are derived from the fact that Kazakhstan, as a member of the world society with a new economic environment, will need to use its own resources in targeting the priority development of a number of material values production sectors and the social sphere in particular. The principal program of Kazakhstan's development is to provide a profound social re-orientation of the economy and to drastically raise the standard of living, which will require appropriate maneuvers and structural improvements in the production process.

The process of reaching this objective requires not only profound changes in the productive forces development but also changes in the rate of market reforms. It is especially relevant for the priorities in implementing economic reforms. As noted earlier, a renewal of property relations and the transition from dominating social property to multiple forms of property (including private property and joint forms of property) will have the greatest significance. In this respect, we can influence the national production pattern and exercise an efficient resource- saving policy only if there is a proper solution to the problems of ownership of natural resources and enterprises on the republic's territory. We need guaranteed economic freedom in our relations with other states of the CIS (Commonwealth of Independent States), and foreign partners to implement the most efficient options of economic development. This is the main route to economic recovery, overcoming the crisis situation, improving the economic machinery by dismantling the scientifically ungrounded system of centralized resources distribution, and establishing a normal market. This concerns not only the consumer goods market, but also the market for all means of production, currency and manpower.

Developing a market and an overall system of commodity-money relations will be the most important trend in implementing resource-saving strategy. Our historical experience has clearly shown that attempts to avoid a fully developed market inevitably lead to non-economic coercion, the growth of monopolies, and

the producer dominating the consumer. The market and the law of supply and demand should constantly be studied. Economic demand can be formed by a careful and well-organized supply of goods. Prices are an especially powerful regulator of both supply and demand. A marketing system - a series of steps based on a comprehensive examination of market demand, which is designed to satisfy the demand for products and services - also has high potential.

To include the material resource-saving strategy in the concept of Kazakhstan radical development, it is important to take into account the dynamics and structure of income. It is of great significance to correctly determine the population income growth rate and structure, including earned income and income from social consumption funds. The dramatic increase in population income in recent years has been caused by price increases. To overcome inflation and increase real income requires a drastic change towards increasing commodities production and paid services. Predictions for the 1991-1995 period envisaged an increase in the volume of output of Group B by 30 %, and of Group A by 24%.

The following targets could be set based on people's needs and the gradual implementation of rational quotas. By the end of 1995, the target is to basically satisfy the increased demand for cultural and consumer goods. The target could be reached only if the provision of goods produced by the republic itself will increase up to 90% in 1995. Priority should be given to the production of manufactured goods (not including light industry), whose output may increase by a factor of more than 1.8. The amount of these goods produced per capita will be twice that of 1990.

By 1995, it appears possible to increase the output of commodities by a factor of 2-3 through increasing the workload of engineering enterprises; by a factor of 2.5-5.6 through an involvement and partial conversion of war industry enterprises; and by a factor of 1.5-2.7 through an involvement of capacities of fuel and energy. A significant increase could be obtained by involving small and mid-size heavy industrial enterprises. According to calculations, it is possible to involve an additional 417,500 square meters of vacant space at enterprises by changing the specialization of both functioning plants and the plants being constructed whose output is no longer in demand, or by involving laid up workshops.

According to our predictions, by 1995, retail commodity turnover in the republic will have increased by approximately 43%, and its percentage in consumer expenses will have decreased from 87 to 81% due to the priority

growth of paid services. Resource-saving strategy implies an appropriate solution to the problem of prices. To establish equivalent goods exchange between Kazakhstan and other states, republics and regions, a series of predictions should be carried out to determine grounded prices for raw materials by taking into account a number of initial data: the average expenditure in a sector of industry, the level of world prices, and the correlation between supply and demand. World experience confirms the expediency of a flexible mechanism of pricing, which reflects changes in the state of the market. To this end, it is necessary to carry out appropriate research and practical work.

To normalize the consumer market in Kazakhstan, the top priority task is the recovery of the financial system and cutting the budget deficit. A constant deceleration of the rate of production and its rate of efficiency is known to cause the state expenditure exceed its national income with emission becoming the main means of deficit discharge. The domestic situation and our commitments to the International Monetary Fund require us to improve money circulation and drastically cut money issue. A social re-orientation of Kazakhstan's economy is closely related to improving the social production pattern.

Because of the republic's one-sided specialization in the division of labor in the former Soviet Union, huge resources were wasted on meeting the ever-increasing demand of Soviet republics for raw materials and fuel. To produce a unit of output in terms of value required 40% more basic industrial assets as compared to the average figure countrywide. As a consequence, the accumulation fund in the republic's national income turned out to be one of the highest, while international practice proves that the percentage of accumulation fund in the national income should not exceed 15-20%.

The disproportions in the republic's economic structure are connected to investment policy. Up to 85% of capital investments in industry are allotted to the development of the mining and industrial processing sectors. Half of the amount was allotted to the fuel and energy sectors. In recent years, the percentage of capital expenditure on constructing oil-extracting capacities has increased from 10.4% to 24.6% and expenditure on gas-extracting capacities has increased from 5.2 to 12.2% while capital investments in machine-building decreased annually.

The trend towards resource-saving and efficiency requires a dramatic modification of investment policy. We need to radically reduce uncompleted construction, to give priority to commodities production, and to support social and cultural enterprises. This requires the radical restructuring of resources

utilization, which implies the priority growth of all kinds of capital investments allotted to strengthening the material and technological foundation of the social and cultural sphere. Calculations illustrate that the percentage of these investments in the total investments in the national economy may increase in the next 3-4 years up to 34%, as compared to 26% in 1990.

One of the characteristic features of modern investment policy in the republic is that, as a result of economic reform, enterprises have significant financial resources at their disposal. For example, the percentage of centralized investments in the total amount of state expenditure will now be less than 40%, as compared to 71.3% in the twelfth five-year period. This should increase the efficiency of capital investments by improving their technological and reproductive structure and refining the management of the investment process. In the future, the investment program should be directed to ending the economic crisis, accelerating the restructuring aimed at a social orientation, and increasing production efficiency at a new resource-saving level. The total amount of capital investments in the national economy from all financing sources for the 1991-1993 period could be increased by approximately 26% (in comparable prices), including an increase in consumer goods producing sectors by a factor of 3.4; in the machine-building complex by a factor of 1.5; and in the construction materials industry by approximately 40%. Priority should also be given to investments in agriculture, especially in the social sphere. Qualitative changes in the investment structure are desperately needed here. For example, the percentage of capital investments allotted to the development of agriculture could go down from 22.9 to 15.3%. This is connected to a transition to sector-intensive development and giving up construction of huge complexes yielding no return. At the same time, the capital investments allotted to the development of processing sectors of the agro-industrial complex will increase approximately 1.5 times as compared to the 1986-1990 period.

From the point of view of optimization of the social production pattern, the highest priority for developing the construction complex is strengthening the material and technological foundation and the transition to an advanced industrial basis. This will require an increase in the total volume of the construction materials industry output by a factor of 1.2, including a 40% increase in cement production, a 55.2% increase in wall-building materials, and a 23.5% increase in precast concrete. The development of construction materials production capacities should basically be oriented toward the maximum utilization of local resources, such as building new enterprises in Kustanai, Zhambyl, Uralsk,

Atyrau, etc. However, resource-saving in the construction materials and building industry is necessary as well. For example, the percentage of products that ensure a savings of raw materials during production should be increased. To this end, we propose increasing the proportion of cement produced according to "dry technology," and the proportion of fine gravel and chips, small porous blocks, blocks with artificial porous fillers, wall-building materials, lime bricks and small lime blocks.

To optimize the structure of Kazakhstan's national economy, we need a policy aimed at shifting industrial activities towards consumers' demand, and the priority development of enterprises and sectors producing commodities and services for the population. A certain shift in this direction could be created by developing light industry where one ruble of basic production assets produces 100 kopeks of net output as compared to 16.3 kopeks in the industry as a whole. Therefore, we propose that during the 1991-1995 period, Kazakhstan should establish 36 new light industrial plants, expand 9 enterprises and modernize 9 enterprises.

An advancement of the pattern of Kazakhstan social production largely depends on an acceleration in the development of the mechanical engineering complex. The latter is characterized by poorly developed sectoral and intrasectoral specialization, which necessitates the implementation of radical steps towards sectoral development, restructuring, and a radical increase in production quality. This problem can be solved by improving the utilization of machine-building potential, creating a number of new predominantly hi-tech sectors, centralizing the manufacturing of products used in different sectors and in the machine-building branches, designed to eliminate production duplication and ensure the specialization of the repair industry.

Given the necessity to intensify machine-building production and the possibility of financing capital investments at the expense of internal means, a priority trend of sectoral development should be a reconstruction of functioning enterprises. This is required to intensify the process of eliminating funds for which a sinking capital has been accumulated, and to improve the sectoral and technological structure of capital investments along with the import and export proportions of the sector output. Kazakhstan could export up to 60% of its instrument-making production, and cut imports of machine-building products for light and food industries and imports of domestic devices from other countries of the CIS by approximately 40%.

During the five-year period, the total volume of the mechanical engineering

sector output in the republic could be increased by 35%, and its percentage in the total volume of industrial production should increase from 16.7% in 1990 to 17.9% in 1995. Similar directions of improvement of social production should be developed for other sectors of material values production and subsequently for the national economy as a whole. For example, in terms of achieving the maximum raw material-saving, the following sectoral structure of industry should be ensured (Table 18).

The table envisions an accelerated development of those sectors whose products are especially in demand. The portion of sectors that predetermine the acceleration of scientific and technological progress and improving production efficiency is considerably increased. Changes in the industrial production pattern are the most important factors affecting changes in materials consumption of production. Scientific and technological progress changes the proportions between mining and the processing industries, and proportions within the subdivisions and sectors. Changing the industry pattern towards increasing the share of the mining industry, metallurgy, electric power production and other sectors with higher materials consumption of production increases the general index of materials consumption in industry, as they require larger capital investments in basic production assets. Increasing the share of mechanical engineering and metal-working industries, which are characterized by a relatively low materials consumption, decreases the general index of material consumption in industry.

Table 18

The sectoral structure of Kazakhstan industry, %

	1990	1995
Industry as a whole	100	100
including:		
fuel and energy balance complex	5.5	18.8
metallurgical complex	15.6	13.4
machine-building complex	15.9	17.9
chemical and timber complex	9.0	10.4
construction materials industry	5.6	5.6
light industry	15.6	15.8
food industry	15.8	16.3
others	7.0	1.8

Improving the sectoral structure of material values production is an important factor of raw materials sources saving. Therefore, the envisaged proportions should be optimum, and should be targeted at the implementation of resource-saving policy under the accelerated development of the sectors ensuring scientific and technical progress, and, at the same time, at improving reproduction of the labor force and ensuring material prerequisites for increasing the productivity of labor. The basic criterion of progressive structural changes in industry is the acceleration of the economic growth rate achievable at the least possible (for the given stage of development) expenditure of direct and materialized labor per ruble of gross product or national income. The realization of planned parameters of national economic development may affect the structure of the gross national product (proceeding from the volume of production in comparable prices of 1983) in the following way: in 1995, the industry share in the aggregate social product would increase from 48.5 to 50.5%, as compared to 1990; the share of agriculture would decrease from 23.5 to 21.5%; the share of construction would increase from 14.7 to 15.8%; the share of transportation and communications would decrease from 7.1 to 6.3%; and the share of other sectors would go from 0.2 to 0.1%.

How will the policy of material resource-saving influence the envisaged concept of the republic's social and economic development? Unfortunately, this a definite answer to this question might include significant errors. Therefore, it is necessary to specify the resource-saving strategy using the materials consumption index of the aggregate social product, MC, (expressing the ratio of the cost of materials consumed per year, M, to the cost of gross national product, GNP):

$$MC = \frac{M}{GNP}$$

We use the aggregate national product in predictions of resource-saving because, thanks to its qualitative and quantitative definiteness, it creates a material basis for the reproduction process as a whole.

When regulating the reproduction process, one must constantly solve the problem of the composition of the aggregate national product and its various parts, compare the use values to each other and to the expenditure on their production, and consequently, decide on how economic policy should be implemented. For example, the amount and portion of the recovery fund can be

significantly reduced if new means of production are of higher quality or use fewer resources, which will cause an increase in the national income. Materials consumption of the aggregate social product in Kazakhstan was changing as follows: in 1985 materials consumption per one ruble of material expenditure on the national product was 50.6 kopeks; in 1986 - 50.1; in 1987 - 51.4; in 1988 - 50.3; and in 1990 - 62.2 kopeks.

What are the prospects for the material resources economy up to the year 1995? If we analyze the above-stated concept of the republic's national economic development, we will arrive at the following figures. Materials consumption of the aggregate national product of Kazakhstan is supposed to equal 62.2 kopek/ ruble in 1990, in 1991 - 61.4, in 1992 - 61.1, in 1993 - 60.8, in 1994 - 60.4 and in 1995 - 60.3 kopek/ruble. In 1995, materials consumption (including depreciation) would be 96.9% relative to 1990, a decrease of 3.1%. The latest five-year period was also characterized by a decrease in materials consumption (except for 1987).

In practice, however, the trends of materials consumption may have different directions. Therefore, we must ask ourselves what are the allowable limits of materials consumption growth, beyond which the society suffers losses? If an increase of materials consumption is compensated by saving on the direct labor per unit of output, the materials consumption growth is economically justified because it effects an increase in labor productivity and maintains or reduces the aggregate expenditure of labor per unit of output. In case the increase of materials consumption is not counterbalanced by a savings in labor costs, the social production efficiency decelerates or declines (if this increase does is not channeled towards other targets such as improving conditions in the workplace and the environment, cutting material resources expenditure, the improving quality of the production, etc.).

Materials consumption of the production may be caused by increasing the duration of launching new production capacities and a transition to modernized industry on the basis of automated production. We think that the policy of material resource-saving should be reflected in the concept of Kazakhstan's economic development through a scientifically-grounded value of accumulation. Expansion of production is closely connected with accumulation, i.e. using a portion of the national income to increase production assets and emergency stocks. Saving production assets, increasing their quality and improving their utilization make it possible to receive greater output with relatively low capital investments. Hence, the amount of accumulation and its utilization directly

influence the economy of materials resources, and the materials consumption rate of the aggregate national product.

It is urgent to substantiate the minimum amount of accumulation that would help to realize the tendency toward the production of economic growth and to obtain the maximum economy of material resources. At present, Kazakhstan's economy is characterized by a rather high rate of accumulation. A further increase would not necessarily bring about expected results. For a number of reasons, actual practice shows the absence of optimum proportions between the volume of capital investments and their efficient utilization. As a result, the possibility of wasting the means and time required for construction works increases. In the long run, the rate of economic growth and resource-saving is decreasing.

To investigate the problem, let us take the most general and basic proportion of accumulation: the correlation between production and consumption. An unresolved issue here is the methodology for finding an optimum amount of accumulation. The rate of accumulation could be predicted as follows. First of all, we should predict the population growth in Kazakhstan, taking into account changes according to age and sex. Various models could be applied. [12] According to predictions, in 1991 the population would total 17.04 million people, in 1992 - 17.25 million, in 1993 - 17.45 million, in 1994 - 17.64 million and in 1995 - 17.84 million people. The population of the republic in 1995 would increase by 5.9% relative to 1990, as compared to 6.8% in the current five-year period. Given an approximate population growth, national income consumption per capita can be substantiated.

The next important step of substantiating the rate of accumulation with a purpose of achieving maximum saving is to predict the growth of the aggregate social output, taking into account the national income dynamics and the dynamics of the recovery fund. The national income growth could be predicted on the basis of accumulation and the number of people employed in the sphere of material values production. This would make it possible to predict the national income using the following model:

$$R_t = R_o (1+ea)^t,$$

where R_o and R_t

are the national income in the beginning and in the end, respectively, of the planned period T; e = efficiency of the basic production assets; and a = the portion of accumulation fund in the national income. [13]

As the revenue is produced in the sectors of the material values production, the number of people employed in them should be accounted for. The priority growth of the population involved in the non-productive sphere would also take place, which is in line with the policy of restructuring social and economic processes in Kazakhstan. As a result, given the number of people employed in material values production and their predicted productivity, net output utilized for consumption and accumulation could be defined: in 1995 it would increase relative to 1990 by 127.1%.

Now we can determine the value equivalent of the recovery fund, including the means of labor for replacing depreciated machinery and equipment, along with the subjects of labor which are indispensable for the resumption of production. The amount of the recovery fund dominates the aggregate national product and is bigger than the national income. Therefore, exploring the ways to economize in this area has great practical significance. Implementation of an appropriate policy of resource-saving would make it possible to produce a larger amount of use values with a given amount of resources. Due to this, cutting the share of material values expenditure (recovery fund) in the aggregate social product is the most important condition of an increase of the physical amount of national wealth. Summing up the obtained values of the national income and the recovery fund, we can predict that the republic's gross national product growth for the 1991-1995 period will be from 73.2 to 87.4 billion rubles. Consequently, the gross national product in the republic is expected to increase by 24.4% and its materials consumption (including depreciation) would decrease from 62.2 to 60.3 kopek/ruble, as was pointed out earlier. Thus, we have obtained the dynamics of the most important indicators characterizing Kazakhstan's economic development.

Now we can proceed to predicting a rate of accumulation with regard to the economy of material resources. In terms of resource-saving, this economy must be the lowest and, at the same time, provide a maximum increase in national production efficiency and, consequently, in the standard of living. Hence, predictions should take into account national income consumption per capita. Table 19 was compiled using the above-stated initial data and carrying out appropriate calculations.

Table 19

Structure of the consumed national income in Kazakhstan

	1990	1991	1992	1993	1994	1995	1996
	relative to 1990,%						
Recovery fund, bln. rubles	26.1	29.2	29.5	31.3	33.0	34.8	132.5
Accumulation fund, bln. rubles	9.6	11.6	8.4	8.8	9.3	9.0	109.7
Rate of accumulation, %	26.8	28.4	22.0	22.1	22.0	20.4	0.96

This table shows that the changes in the structure of the consumed national income are aimed at a social orientation of the economy and an increase in the standard of living. In 1985, the rate of accumulation was 29.6%, while at the end of the current five-year period it is expected to be less than 21%. What is essential is that a share of resources for non-productive construction could be increased in the accumulation fund itself. In 1990, it equaled 2.24 billion rubles, while in 1995 it may amount to 2.93 billion rubles, i.e. an increase by a factor of 1.3. The growth of the accumulation fund as a whole is expected to reach 109.9%. The envisaged structural changes in the national income, especially in the accumulation fund with regard to the tendency toward social production growth, reduction in materials consumption, the development of the non-productive sphere and raising the standard of living can only be implemented by observing a regime of economy. The above-stated most essential propositions of the concept of radical development of Kazakhstan national economy including envisioned indicators of economy are specified in Table 20.

Table 20

Proportions of the most essential indicators of extended reproduction in Kazakhstan, 1991-1995

Indicator	Growth in 1995 as compared to 1990
Aggregate social product	1.24
Revenue used for accumulation and consumption	1.27
Materials consumption of the aggregate social product	0.97
Productivity of labor (according to national income)	1.25
Number of employed in the sectors of material values production	1.04
in non-productive sectors	1.1
Revenue per capita	1.2
Rate of accumulation	0.86

The data in Table 20 illustrates that concretization of the concept of Kazakhstan's subsequent development is based on an increase in the social and economic efficiency of production and its intensification with regard to the acceleration of scientific and technological progress and resource-saving policy implementation. Growth rates of the aggregate social product and the national income outrun an increase in the number of employed. The growth of labor productivity somewhat outpaces national income consumption per capita. Hence, a material source of an increase of the standard of living is created.

The figures presented in Table 20 undoubtedly contain an element of

uncertainty. This can be explained by the objective complexity of specific directions and peculiarities of the economic development processes in Kazakhstan, caused by the current revolutionary changes. Reserves of resource-saving are considerable and not all have been taken into account. For example, the amount of resource-saving is far from optimum. Our analysis has shown a potential of still greater economy in the future (Table 21).

Table 21

Prediction of resource-saving in Kazakhstan's national economy

Parameter	1995	2000	2005
Materials consumption of the aggregate national product, kop/ruble	47.2	46.5	45
Materials consumption of the productive national income, ton/mln. ruble	47.2	46.5	45
Power consumption of produced national income, ton/mln. ruble	47.2	46.5	45
Amount of produced secondary resources, mln. tons	709	635	-
Rate of secondary resources utilization, mln. tons	107	124	-
Rate of utilization, %	14.8	19.5	-
Volume of commodity output produced by utilizing secondary resources, mln. ruble	107	124	-

We need options rather than an exact economic prediction for the future. At the same time, the degree of ambiguity should be limited. The dynamics of global indicators of resource-saving were determined with regard to the following: intersectoral structural shifts with the transition to market relations; scientific and technological progress, and other, sometimes contradictory, factors. For example, the first group of factors has contributed to a decrease in their coefficients, and the other group has contributed to their increase. However, their resultant has manifested itself in a clear tendency towards the economy of raw materials. Availability of considerable reserves of economy cannot be discovered only by predictions. Experience shows that even now the economy of material resources can produce tangible results. For example, an economy of 1% saves about 6% of capital investments.

Hence, the rate of accumulation could also be reduced. In mechanical engineering, the implementation of material-saving technology and machinery would increase output by 5-6% per each percent of rolled stock production. Machine-building enterprises would annually need tens of thousands tons with chip waste remaining practically the same and the utilization factor being in the range of 0.72-0.75. This is not incidental. In the ferrous metals consumption structure of this sector, a share of sheet steel is still low while a share of section rolled stock is high (60%), the latter requiring expensive (annual expenditure exceeds hundreds of millions rubles) mechanical processing of products with chip waste amounting to 50% of the initial volume. Substituting rolled stock for casting would reduce steel output by 20%. In ferrous metallurgy there are still losses of mineral raw materials during extraction and processing in the form of production waste.

The Lisakovskiy ore mining and processing enterprise is an example of an inefficient operation of an iron ore deposit. Since 1970, it has been working a brown iron ore deposit bearing the same name, employing open-cut mining. The deposit is unique as it contains 65% of Kazakhstan's ore reserves and their extraction is very cheap. It is practically a gift from nature because the bedding is very close to the surface (1- 2 meters deep while in the central part it is 15-20 centimeters deep) with a level bed 40 meters thick, 100 kilometers long and from 0.6 to 6-7 kilometers wide. All this provides for mining of the cheapest iron ore with a cost price of 52 kopeks per ton.

The ferrous metallurgy in the republic has a high potential for resource-saving. It includes the production of quality metal by increasing a share of sheet rolled stock with 45% tin coating and 25% chrome coating, application of

continuous steel teaming, an intensification of metallurgical processes with oxygen blast up to 35%, and electric power saving under ferroalloys smelting. A second area of savings is in the economy of solid materials consumption of steel production, saving electric and thermal energy and vapor, cutting the losses of technological gases and heat in the converters, recycling metal cuttings, scale, parts of rolls, dust and gases, refuse and sinter, etc., as well as recycling ferrous metals scrap, and trapping and utilizing exhaust. A third category is the utilization of iron ore by introducing a novel technology (for the first time in the world) of complex recycling of black iron ore wash discard from the Sokolovskiy and Sarbayskiy deposits with a simultaneous extraction of seven elements; the complete metallurgical processing of brown iron ore from the Lisakovskiy deposit with the extraction of vanadium, alumina, phosphorus and other elements, trapping and extracting germanium, manganese and other elements from Atesuiskiy deposit ores, as well as the complex utilization of manganese and chromite ores with rare and scattered elements extraction.

The above-stated resource-saving potential is undoubtedly important. However, to realize an efficient policy of resource-saving, radical global economic and organizational measures are needed. They include an acceleration of management decentralization, a transition to joint-stock property, the development of market relations, eliminating monopolization, and autonomous activities in the international marketplace. For example, the mining enterprise in Aktyubinskiy region was producing 95% of the chrome ore output in the countries of the former Soviet Union. The selling price was fixed by central management at 27 rubles per ton. The Ministry of Foreign Economic Relations exported the ore at a price of 100 hard currency rubles per ton, many times higher than the selling price. The same is true for copper produced in Balkhash and there are many other similar examples.

The Ministry of Foreign Economic Relations did not share the currency with either the enterprises or the region. Kazakhstan has developed a concept of radical economic reform as applied to the conditions in the republic. According to this concept, the introduction of different forms of ownership and market relations would be supported by creating the most viable production patterns and technological concerns under market conditions. They should be formed on the basis of cooperating sectors and create a strong economic backbone, and do away with departmental dictatorship and the producer's monopoly. It is essential to assuage the producers' alienation from the results of their labor at large-scale industrial enterprises. All this is expected to contribute to the realization of an

efficient strategy of material resource-saving. Thus, using the concept of resource-saving and economic reform intensification, the social and economic strategy envisages a breakthrough to a higher level of development.

CHAPTER XII
TRANSITION TO A SOCIALLY-ORIENTED MARKET

The scientifically-grounded concept of national economic stabilization and the transition to a market economy envisions the creation of the following basic conditions for the functioning of the market economy during the transition period: introducing commercialization and freedom of the economic activities of enterprises which are the principal subjects of market relations; encouraging economic bodies, businesspeople, and workers to take full responsibility for the results of their economic activities, based on the equal rights of all forms of ownership; establishing competition between producers, necessitating the elimination of monopolies and the formation of an appropriate production pattern; setting up free price determination, thus creating a balance between supply and demand; giving up state interference in the economic activities of enterprises (except in special sectors); expanding market relations on those spheres where they prove to be more efficient than command methods of control, and simultaneously maintaining a considerable non-market section for the activities which cannot be controlled by commercial criteria alone (defence, health services, education, science, culture); encouraging the openness of the economy and consistently integrating it into the system of international economic relations; and having the state authorities provide social guarantees for the population - all citizens will have equal opportunities to achieve a proper standard of living by working and economizing, and the state will support disabled and socially vulnerable members of society.

At the same time, the free market should not be treated as a spontaneous

market. International experience shows that it needs state and public control. The state that exercises a macroeconomic policy contributes to the creation of a favorable environment for economic activities, especially those meeting public needs. Analysis of the country's economic development and the experience of developed countries proves that the transition to a market economy is objectively necessary and historically inevitable. It requires, however, certain prerequisites and well-considered judgements.

Practical steps instituted by the government of the former Soviet Union not only failed to improve the situation in the country, they made it worse. These steps were not radical and comprehensive. The economic reform package of 1987, which was dubbed "radical," was not radical at all. It did not affect the basis of the existing economy - the state ownership of property and the methods of economic activities. Therefore, for several years, the economy steadily declined and an economic crisis loomed. The financial situation in the country and the consumers' market drastically deteriorated. Radical comprehensive steps towards a transition to market relations were required. However, the radical transition to a market economy was not conditioned by errors and failures in exercising economic control during the period of perestroika (restructuring), but by the inviability of the former social economic system and the defects inherent in the highly centralized command control over the national economy.

The transition to a market economy is an historic opportunity for the CIS countries to embark on the path taken by economically well-off countries, and to overcome the profound political, economic and social crisis. However, the market alone was not the answer to the troubles. We should not expect that the transition to a market economy would bring about an abundance of material wealth. Many people claim that the market controls supply and demand by itself, fixing equitable prices. Actually, the market allows members of society to fully realize their abilities and offers them the opportunity to raise their standard of living. To put these relations into effect is a difficult task that depends on numerous factors and circumstances.

When discussing the advantages of the market, many experts discuss capitalist countries in terms of having a high standard of living and a dynamically developing economy. Meanwhile, they conceal the fact that this high standard of living was not reached at once and that the economic development was fraught with crises, often accompanied by economic chaos, soaring prices and a catastrophic fall in the standard of living. Even under a market economy, most countries are still in flux. Most places have unemployment, which from time to

time reaches a dangerous level. In many countries with a market economy, a considerable proportion of the population has a low standard of living and each year many skilled workers emigrate to search for employment.

It would not be right to convince the people that their standard of living will go up with the transition to a market economy, only alluding to the fact that the transition might not be easy for everyone. In a number of advanced capitalist countries, the high standard of living and dynamically developing economy come at the expense of the cruel exploitation of foreign workers and making huge profits from developing countries. Kazakhstan faces enormous hardships with the transition to a viable and socially-oriented market. This might be a protracted process with grave consequences, which will be determined by a number of factors.

The republic faces numerous economic, social, political and ecological problems which have been building up for decades and now need to be solved.

In addition, Kazakhstan is establishing market relations at a time that it is facing a growing economic crisis. The decrease in social production growth rates of recent years has been replaced by the decline of its absolute volume and efficiency. The crisis has involved not only the economic and social spheres but the political one as well. The third category is conditioned by the fact that the republic is making the transition to a market economy without having a market infrastructure (trading banks, foreign trade bank, insurance companies, labor exchange, commodity and stock exchange, data banks on various aspects of economic activity, commercial wholesale enterprises, etc.). The market cannot operate without this infrastructure. Kazakhstan also lacks basic experience in organizing the money and labor market. The enterprises and organizations that are the prospective subjects of the market are still subordinated to the ministries and departments that only introduce uncertainty in the economy. The overwhelming majority of enterprises are still state-owned. This implies that when the enterprises find themselves operating in the market, having become not only autonomous but also responsible, they might fail the test and go bankrupt. This could happen to profitable enterprises as well.

Kazakhstan's economy is dominated by a monopoly on production, distribution and trade, and there is no place for competition. Cooperatives and small-scale enterprises do not greatly contribute to meeting market demand and developing competition. External economic relations are being established very slowly and on a limited scale. Except for some large-scale programs, foreign investments are used only to found joint ventures. Market openness and foreign

manufacturers would provide the competition which is vitally important for establishing a viable market.

Market establishment would be impeded by lack of personnel (managers, tax inspectors, etc.) with knowledge of the laws and conditions of the market and of marketing. Kazakhstan needs to create a network of training and refresher courses to prepare people to work under market conditions, retraining courses for the unemployed, and a job placement system. Laws which are vital for establishing and developing the market have not yet been drawn up, and those already passed often do not work. The republic is wasting precious time in its preparations for the transition. Many measures that have been formulated could be realized before a more concrete and comprehensive program of future action is accepted.

The transition to a market economy may, therefore, be very painful. A further decline in production and the national income is possible. Prices would rise, followed by runaway inflation. Another threat is unemployment. A decline in the standard of living that would affect the majority of the population, especially indigent families and people on a fixed income, would be difficult to halt. Certain scientists and statesmen have predicted optimistically that drastic changes will have taken place by the spring of 1993. We do not find any objective grounds to believe this will be true. The transition to a viable market meeting the needs of people depends largely on the way it is implemented, a series of interrelated steps, and the terms and sequence of their realization.

When discussing the transition to a market economy, we are faced with the question of what kind of market is desirable, a free market with spontaneous tendencies or a regulated one? Some economists regard a regulated market as a deviation from principles of market relations, as a developed market is known to imply that manufacturers have complete autonomy and responsibility, and that they have the free choice of partners for buying and selling on the basis of contract (free) prices. In the modern world, however, there are few countries with an completely free and unregulated market. In developed capitalist countries, a spontaneous and unpredictable market is actually a thing of the past. All of them have eventually instituted a state-regulated market.

This misunderstanding was apparently caused by interpreting a regulated market as centralized price-fixing or establishing production targets. Market control is, in fact, any state or central financial and banking body having influence on demand, supply and prices; the organization does not necessarily fix rates. For example, price control may imply instituting anti-monopoly measures,

limiting demand, taking steps to increase the output of products in scarce supply, etc. Effective state control of the market is especially vital at the stage of its formation to limit any negative consequences; otherwise, it will take a long time for a viable market to take shape.

Under existing conditions, market introduction should start with stabilizing the economy and instituting a financial recovery plan aimed at balancing the budget, strengthening the currency and providing the population with consumer goods. Regarding empty shops and the huge budget deficit, an accelerated introduction of market relations is bound to cause runaway inflation and a drastic decline in the standard of living. The 500-day plan assigns 100 days to stabilize and strengthen the ruble. It is well-known that the people's deputies of the Supreme Soviet of the Soviet Union have hindered putting these measures into effect. Their only argument was that these measures were "unrealistic," although the Polish experience seems to prove the opposite.

During a comparatively short period of time, Poland conquered inflation, cutting price increases from 78% in January to 5% in March, flooded the market with goods, and secured the domestic convertibility of the zloty. Nevertheless, the economic and political situation in Poland leaves much to be desired. The population is discontented with high prices and rising unemployment. Reform in the former Soviet Union was adversely affected by the fact that vital decisions were made and implemented in a half-hearted and inconsistent manner. The country (now the Commonwealth of States), which was the first among the post-communist countries to proclaim perestroika and radical economic reform, appears to be the last to enter the market.

Under the present situation, stabilization measures are implemented along with steps to establish a market mechanism. This affects market prices, which are constantly increasing. This seems an appropriate opportunity to discuss certain measures that ought to be implemented in Kazakhstan. One of the main reasons for the state budget deficit is the unceasing subsidy of losing enterprises, which account for about 50% of all existing enterprises. There are about 1.3 thousand unprofitable enterprises in Kazakhstan with an annual total loss amounting to 1 billion rubles.

There are many ways to solve the problem of unprofitable enterprises. The choice must be based on an analysis of the reasons each particular enterprise lost money and the condition of its basic assets. The principal ways are to change the specialization of the enterprise by producing consumer goods, to re-equip enterprises to manufacture different products, and to let or to sell the plants to

cooperatives, collectives, enterprises or private individuals. In certain cases, the losses can be overcome by a transition to market (free) prices. Under acute shortage of all kinds of products, an immediate liquidation of the losing enterprises is an extreme step, because it may decrease production by 25-30% and increase unemployment by 3 million people. In a number of cases, such enterprises could be given financial backing. Many companies in the United States and Western Europe operate with state subsidies.

Inefficient investment policy has lead to unrestricted growth in the number of production facilities, uncompleted construction, and the distortion of the proportion between accumulation and consumption funds in used national income. According to predictions, business investments could be cut by a third without affecting the rates of economic growth. Uncompleted constructions could be conserved and auctioned off to collectives, cooperatives or private individuals. The budget could be substantially replenished by selling off state-owned property. There are considerable reserves in the national economy control apparatus, and expenditure could be cut by 30-35%. Normalizing the situation at the consumers' market is the most complicated and painful problem. On the whole, a program to bind the population money surplus, estimated at 10-11 billion rubles, has been developed. Kazakhstan is having difficulty providing its population with consumer goods. This is connected with the republic's strong dependence on supplies from other states of the CIS, especially for manufactured goods, because this sector is poorly developed in the republic.

Under developing economic relations, this situation has put Kazakhstan in a predicament and provided little chance for recovering these relations on the former scale. Hence, the target is to take urgent steps to drastically increase the production volume and the importation of consumer goods. To this end, the economy should be re-oriented to the need of this sector, with the largest share of financial, material and technological resources being allocated to it. Here, Kazakhstan should employ the most efficient ways to solve the problem, solutions that do not take more than a year or two. One of them implies restructuring of agricultural production and cutting losses of agricultural products by accelerating the development of the infrastructure (store-houses, refrigerators, etc.), small processing enterprises, trade and buy cooperatives, and leasing.

To increase the output of manufactured goods, additional measures are to be taken to stimulate production, to shift the specialization of losing and unprofitable enterprises and uncompleted facilities, to accelerate the conversion

of defence industry enterprises and to establish new joint ventures. Of special significance is the development and stimulation of small enterprises, cooperatives and private enterprises. It is of primary importance for the republic to increase its imports through the maximum use of its export potential and foreign investments.

The market needs independent manufacturers. This will result from the privatization of property, 90% of which is state-owned. State-owned enterprises can function under market conditions if the owner's functions are isolated from those of the economic manager. This has been proved by the economic experience of England, France, Austria, Sweden and other nations. However, this is not enough for the market; it requires the privatization of a portion of the state-owned property. According to some experts, the privatization process in Kazakhstan should be accelerated. They maintain that the market can exist only if 70% of the state-owned property has been privatized.

No doubt, Kazakhstan has favorable conditions for carrying out privatization as small and mid-size enterprises make up the lion's share of industrial enterprises, to say nothing of other sectors. They share more than 50% of basic assets. However, this is not grounds for expecting high rates of privatization, or having the population purchase a considerable number of industrial enterprises. The people in the republic do not have enough money at their disposal for this. If they have savings, this money is actually a deferred demand for durable goods, because they have been absent from the shops. This sum covers only 8% of basic assets, and only an estimated 2-3 billion rubles could be allocated to purchase enterprises.

Under present conditions, accelerated and large-scale privatization could only be by force, as once happened during the drive for industrialization and collectivization. This must be stringently avoided. Privatization should be strictly voluntary. This implies that all restrictions should be lifted and citizens would have the right to purchase part or all of an enterprise. The privatization process is expected to be rather slow, especially if we take into account certain attempts to restrict the sale of enterprises to private individuals.

Private owners are usually enterprising persons who make better use of purchased property. They combine complete autonomy and freedom of economic activities with appropriate responsibility for the results of their endeavors. In developed countries, private owners were the motivation for development. They live up to this reputation in our republic as well. Therefore, the private sector ought to be developed by providing it with the necessary

economic freedom in order to accelerate market development and flood the market with goods. The most powerful obstacle to market evolvement is the monopoly on everything: on production and distribution of goods, control, management, etc. This is the first time that this country is waging war against monopolies.

Leaving aside other aspects of the problem, we would like to single out a trend that is gaining popularity, namely the attempt to substitute a regional monopoly, i.e. a monopoly of local authorities, for the central monopoly. We often hear claims these authorities are regional landlords and should be included in the system of market relations. To implement this policy, we recommend a new procedure of taxation and independent budget-making on various levels. There is nothing negative in having Soviets of different levels drawing up budgets autonomously. The government plan envisages the same approach, the latter being the right way to provide for the autonomy of local bodies. The heart of the matter is in the recommended procedure of establishing an interrelationship between autonomous budgets.

It is proposed that all state and local taxes go to the budget of a regional Soviet controlling the territory where the taxpayer's business is situated. The Soviet would allocate part of the revenue to the budget of a higher Soviet for meeting common needs. The principal reason for this is to turn Soviets into the real landlords of the territory. Meanwhile, international practice shows that the basis for formation and distribution of budgets of different levels along with the distribution of taxes and payments according to these levels is created by functions that can and must be exercised at the appropriate level. This procedure ensures the proper allocation of taxes and other payments, provides equity in the relations of budgets of different levels, and removes the problem of distributors and dependents.

What mechanism of budget revenue distribution has been proposed by the proponents of complete financial autonomy? "The law is to envisage the mechanism of such assignments. They can be fixed as an absolute amount or as a percentage of a certain income." [14] It might appear easier and more consistent to design the budgets of higher Soviets using these parameters than according to tax distribution. On the contrary, this would only complicate the problem and would cause confusion in the annual budgets. We should also remember that taxes serve as a production regulator. Unfortunately, this procedure of drawing up budgets may become a reality on the grounds of the Law of Property passed by Supreme Soviet of Kazakh SSR, which establishes

the local Soviets as owners of everything that is on their territory. The fact that the word "ownership" does not appear in the law does not change the situation.

Two misunderstandings have arisen. Firstly, national property has been identified with state property. Non-state property - collectively-owned, cooperative or private - cannot be turned over to a state body. This belongs to the Kazakh people and cannot be turned into the property of a region or of the city residents. The second misunderstanding is caused by extending the notion of state sovereignty (formerly possessed by Kazakh SSR according to the Constitution of the Soviet Union) to the level of regional bodies. These bodies are only the owners of municipal property as a part of the state property.

According to the law, the Soviets are entitled to utilize natural and labor resources. As we see it, local Soviets owning these resources should perform their functions by establishing contractual relations with the owners of other forms of property on their territory. Giving the local bodies the right to use and control the output produced on their territory actually deprives the production collectives of their property rights and their right to appropriate the results of their work. In the past, they were deprived of these rights by ministries which excluded motivation for efficient work. Now, they say, it must be done by local authorities who are the representatives of state control.

Substituting the right of local government bodies for the right of ministries would lead to a territorial monopoly, weaken the republic's statehood and negatively affect its economic growth. The territorial monopoly is no better for market development than the departmental one. Besides, it would render privatization meaningless. Price determination is the most acute problem of the transition to a market economy. Quite a few advocates have called for lifting all restrictions on retail prices as well. Numerous facts and scholarly works written by prominent experts on the market economy prove that free price determination is a myth, and no developed nation has one. Allegations that there is no market without free prices are far from true.

In many countries, the government often indirectly affects prices by influencing supply or demand, or both. It is well known that governmental programs to restrict agricultural output in the European Common Market led to price increases and profits by cutting supply. Free retail prices with a severe shortage of goods, unlimited manufacturer monopoly, a skewed production pattern, unrestricted wages growth, and a lack of control over monetary circulation would inevitably lead to higher prices. This would be accompanied by an additional increase in wages which, in turn, would cause another price

increase.

This cycle would be followed by surging inflation, and at a certain moment, creeping inflation turns into hyperinflation which becomes uncontrollable. This process is irreversible. This has been the experience of Poland, Yugoslavia, Hungary and Romania. The experience of Estonia and other nations of the former Soviet Union which have completely lifted price controls testifies to the same effect. Under a situation like this, a catastrophic fall in the standard of living occurs and the majority of population lives on the verge of poverty.

The government program for Kazakhstan establishes that most of the prices are free while retail prices for some goods are regulated (restricted). Wholesale and purchasing prices remain free. The state makes up the difference between restricted retail prices and purchasing and wholesale prices. Freezing prices for staple foods and priority goods along with rationing would cushion the fall in the standard of living and make the transition to a market economy less painful.

Many nations have taken a similar approach to price determination for socially significant goods and services and medical aid in a period of crisis. For market establishment it is essential to develop a mechanism to regulate the market and prices in particular. This means enacting a package of rules and specific parameters to regulate the market. Incentive, rather than prohibiting, parameters of the regulation contributing to production increase and restraining price growth are now of primary importance. This is a very complicated process. Entering the market without establishing vital regulating laws is a dangerous move. The slogan "Everything is permitted that is not prohibited by the law" illustrates the potential consequences in a situation where the rules themselves are missing. To create an efficient regulation mechanism, it would be very useful to study the experience of developed capitalist nations. The market mechanism's effective functioning (self-regulation) is possible under conditions when most producers (enterprises, organizations and private individuals) have freedom of economic activities and business undertakings. This allows them to reasonably utilize their property, independently determine production plans, choose suppliers and consumers, fix prices, distribute after-tax profit and solve other important problems related to the market economy.

Let us now turn our attention to a consumer goods market whose development is a key factor in the system of market relations and national economic performance. This market is a concentrated reflection of every positive and negative process in the social and economic development of a society. Under

present conditions, the state of the market is exacerbated. An acute deficit, inflation, the fall of the purchasing power of the ruble, the negative actions of the shadow economy, and profiteering have exacerbated the former defects. These include the lack of balance between supply and demand (volume and structure, time and space); irregularities in trade, from certain goods to entire subgroups and groups of goods; the reduction in the variety of goods and the deterioration of goods; the disparity between the variety of goods and prices; and the demands of poorer sections of the population. Therefore, normalization of the consumers' market is not possible without taking into account the principal factors caused by the economic crisis as a whole.

In order to recover and stabilize the consumers' market, the following is necessary: stabilizing the economy, balancing the population's cash income and expenditures, creating a market infrastructure, establishing the system of free enterprise, and implementing fiscal, credit and price reform. Stabilization of the consumers' market itself within the next few years is possible on the basis of intensive activities in the principal directions: increasing the rate of production and goods resources; "locking up" the surplus money of the population; and maximum restriction of the shadow economy and profiteering. The latter is now regarded as a priority, because the proportion of the national economy and the shadow economy at the consumers' market is a minimum of one to one. The conclusion is based on western experts' opinion that the national economy should be considered critically overloaded with shadow economy relations if the latter's share in the gross national product turnover is 15-30%.

Because of the complexity of transition period processes, former predictions of the state of the consumers' market, which were based on earlier trends, have not come true. Table 22 shows the predictions of the principal market indicators made on the basis of official data and predictions performed by the Kazakhstan branch of the All-Union Research Institute of Trade (VNIIKS). These figures were based on a number of assumptions: within the next few years, provided the present correlation between supply and demand is preserved, the tendency to high rates of retail turnover growth would persist, and higher average retail prices in the turnover would become more significant; the tendency for yet greater involvement of goods resources in the turnover and, consequently, for decreasing their share in trade would not change; the tendency towards solvent demand growth based on the cash income growth would remain unchanged. These factors would increase the disparity between the need for goods and the possibilities of supplying them.

Table 22

Predictions of demand and supply correlation in Kazakhstan for the period of 1990-1993, billions of rubles

Indicator	Predictions			
	1990	1991	1992	1993
Retail turnover of state and cooperative trade	21.5	23.2	25.1	27.0
Goods resources, including goods reserves	25.4	27.2	29.2	31.6
Solvent demand for goods	26.6	30.0	35.1	42.4
Needs for goods to supply:				
-retail turnover	26.3	26.4	30.6	33.0
-population demand	31.4	35.2	40.7	43.4
Disparity between goods resources and needs for goods to to ensure turnover	-0.9	-1.2	-1.4	-1.4
Needs for goods to meet the population demand	-6.0	-8.0	-11.5	-16.5

However, 1991 has brought different results. The dynamics of the correlation between the need for goods and solvent demand has evolved. According to research carried out by Kazakh scientists, the increasing tension at the consumers' market, absolute shortage and inflation have caused consumers to behave in an unpredictable manner. "Escape" from money enhances "mass hysteria" in demand activation. As a consequence, the reasons for purchasing essential and durable goods and the growth of consumer reserves of food and manufactured goods defy analysis and substantiation. A drastic increase in purchases of expensive goods, jewelry in particular, is actually insurance against

the depreciation of the ruble caused by inflation. All this contributes to an intensification of negative phenomena, including a growth of consumer goods reserves for either subsequent exchange or resale and storage. Jobbing flourishes when everything is an object for profiteering - from imported quality goods to domestic goods such as shampoo, soap, hair spray, thread, tobacco products and other priority goods. Surging shortage has affected the consumers in such a way that, according to research, most of those questioned, regardless of their level of income, try to purchase any goods that they were not planning to buy (Table 23).

Table 23

Behavior of consumers with different levels of income in case of a deficit sale, % as of January 1, 1990

Income per family member, ruble/month	Behavior in a deficit sale		
	Purchase immediately if I have money	Purchase even if I have to borrow money	Won't buy
Up to 70	53.9	13.6	26.8
71 - 100	60.1	16.3	23.6
101 - 150	58.7	16.3	25.0
151 - 200	63.8	14.2	22.0
Over 200	63	13.7	23.3

Surveys have revealed that shortage conditions give rise to different types of behavior: 1) making frequent but unsuccessful shopping trips; 2) purchasing goods on the black market; 3) purchasing goods that do not satisfy the consumers; 4) purchasing goods that are unexpectedly being sold at the time the consumer is shopping (unplanned purchase). According to the Kazakhstan branch of VNIIKS, the fourth type of consumer behavior is the most common if there is a chronic and absolute shortage of goods. Most of the respondents said that they purchase unplanned goods if they have the money. On the whole, irrespective of cash income, about 75% of questioned purchasers buy any

goods, on the premise that you should "buy it if you have the chance, for tomorrow it might be gone." This adaptation to shortage conditions along with surplus means no longer leads to rush demand. Today the notion of rush demand has lost its meaning. Therefore, the fourth type of behavior evolves as a norm in the population psychology. The unpredictableness of consumers' behavior is also explained by the growth of consumer reserves of various foodstuffs and manufactured goods and the volume and pattern of personal consumption.

Results of a public survey conducted in 1990 confirm this. The survey demonstrated that the average family has the following reserves of goods:

a) **foodstuffs**: tea - 2 kg, sugar - 6 kg, meat - 4 kg, canned meat and fish - 3 kg. According to these figures, the reserves exceed the rational reserves of tea by 1.5, of sugar by 3, meat by 1.4, fish by 1.5, and of tinned food by 1.6

b) **manufactured goods**: tights - 4.5 pairs, children's tights - 7.2 pairs, socks - 6.2 pairs, pillow cases - 7.2, blanket cover slips - 5.4, sheets - 5.9, detergents - 8.2 kg, liquid detergents - 1.6 kg, laundry soap - 2.2 kg, toilet soap - 2.2 kg, tooth paste - 5 tubes. According to these estimates, these reserves exceed rational ones by a factor of 1.5 - 2.5.

In 1990, the average family bought: men's high boots - 1.5 pair, high boots for autumn - 1.2 pair, men's dress shoes - 1.6 pair, summer shoes - 2.4 pair, women's winter high boots - 1.8 pair, autumn high boots - 1.6 pair, women's dress shoes - 2.1 pair, summer shoes - 2.4 pair, children's winter high boots - 1.6 pair, children's autumn high boots - 1.3 pair, children's shoes - 2 pairs, children's sandals - 2.5 pairs.

The establishment of a consumers' market in Kazakhstan is being affected by specific features of social and economic development. These include a national economic pattern based on exploiting raw resources, undeveloped production of consumer goods and the market's dependence on consumer goods production in the CIS states, a lower average wage, a higher percentage of rural population as compared to the average in other CIS states and correspondingly lower consumption of a number of goods.

Due to established specialization, the republic's basic output which is centrally distributed, the export percentage in the production volume for oil was 70%, for iron ore - 55%, for coal - 28%, for ferrous metals - 46%, for synthetic rubber - 86%, and for general chemical products - 54%. At the same time, the republic was the twelfth in per capita production of consumer goods (48% of the average level). While the percentage of its population is 5.8%, the percentage of

tape recorders output is only 2.8%, washing machines - 4% and watches - 0.41%. As a result, the consumers' market is dependent on the consumer goods production in the countries of CIS as a whole.

The republic imports all its refrigerators, motorcycles, cars, wallpaper, electrochemical cells, batteries for home electric appliances, etc. Over 60% of all imports are cultural and household goods. Even in the sectors where the republic leads all the other states of the CIS, an insufficient variety of the output makes it increase the export of related products. Mining sectors are the most intensively developed, starting with the oil-producing industry. It enjoys 25% of all investments in industrial construction, while the terms of construction of consumer goods producing factories are being postponed year in, year out, and there are no investments in this sector. This proves that the negative trends based on an irrational pattern of national economy have not been overcome.

At present, given the specific features of the republic's social and economic development, the few plants producing consumer goods, and the lack of specialized enterprises to produce cultural and domestic goods, one solution is to produce consumer goods in factories now used by heavy industry and the defense industry. This requires establishing economic mechanisms that would make it profitable for these enterprises to produce consumer goods, and expand and increase the variety and quality of the output of Group I. The creation of a mechanism under which enterprises would be equally interested in the production of consumer goods appears unrealistic. Consequently, overcoming negative trends in investment policy would not be an easy task. In the near future, priority should be given to setting up enterprises specializing in producing consumer goods. As to the participation of enterprises of heavy and defense industries in the production of consumer goods, this would be a more reasonable proposition if they produce advanced domestic devices. Local industry must cope with the production of simple consumer goods.

Steady increase of goods output appears possible through a conversion of part of the defence industry to hi-tech plants. There are plans to convert 10 to 12 enterprises. At present, the conversion is realized as a kind of "quit-rent" imposed on enterprises of the defense industry, i.e. compulsory production of consumer goods without changing the technology of the main production process and retaining the chance of an opposite process - reconversion. Another method appears preferable: transferring a portion of military enterprises to the civil industry and allowing these enterprises to enter the free market. This approach would ensure economic freedom, foster competition between

manufacturers, expand the variety of goods produced, and increase the quality of consumer goods according to consumers' demand. The problem of increasing output of manufactured goods might also be solved by changing the specialization of operational enterprises, a number of enterprises under construction whose production is no longer in demand, and unprofitable enterprises; by using vacant production facilities; by developing production cooperatives and lease-holding collectives; by expanding local enterprises producing consumer goods; by establishing joint ventures with foreign companies; and by instituting production diversification. Thus, 12-16 machine building enterprises and up to 20 metal-working and repairs enterprises could change their specialization without having the slightest effect on the republic's national economy. The same applies to a number of mechanical engineering plants under construction. To fully utilize these reserves, local Soviets should carry out a comprehensive analysis and determine the extent to which mechanical engineering enterprises and other industries can change their specialization.

Under the transition to a market economy and creating competition, an important trend of development is ending "gigantomania," i.e. increasing the number of small and mid-size enterprises that display higher rates of innovations implementation and technological changes. To this end, it is expedient to free the enterprises producing means of production from unusual functions while granting the status of small enterprises to specialized shops producing consumer goods. The relations between these shops and the "leading" enterprise are based on long-term contracts. This would make it possible to establish links with several large enterprises, to do away with the system of long-term compulsory ties, and to actively seek other consumers for the production. The fact that small enterprises are open to new ideas and able to rapidly shift to the production of new products would evolve as an important factor in implementing innovations into consumer goods production. "Separation" of the specialized consumer goods producing shops from the enterprises producing Group A products could be exercised through leasing, shareholding and total redemption.

Unprofitable enterprises or those that are losing money could be auctioned off to foreign businessmen. An advantage of this approach over shareholding is that it involves foreign capital without increasing overseas debt, and foreign entrepreneurs pay the costs of implementing advanced technologies. It is important to involve foreign capital as productive capital, i.e. in the form of machines, devices, and technologies.

Share-holding of losing enterprises is less acceptable when market of

means of production are missing or insufficient. This process would not be able to ensure an appropriate labor productivity growth by implementing advanced technologies, and labor intensification with obsolete equipment could not ensure an appropriate quality of production. Under conditions of market relations development, the interrelationship between heavy industry enterprises and local administrative bodies should be based on stable standards, and the budget of local Soviets must depend on economic achievements of the enterprises. At present, there is no clear-cut vertical structure, i.e. normalized interrelations between Soviets of different levels. Horizontal economic links between enterprises are broken and beyond the influence of local authorities. Local administrative bodies could exercise levers to influence the enterprises: allocating natural and material resource of the region on the basis of competition (priority would be given to enterprises producing the required amount of consumer goods) and on favorable terms, granting capital investments and subsidies, providing financial backing from the consumer goods production development fund and local Soviets budgets. Solution of these problems would ensure a mutual interest in increasing the output of Group B.

The transition to a market economy requires upgrading the significance of information in the productive sphere. Market relations would inevitably cause the manufacturers to feel more isolated. They would therefore increasingly need information on goods, market capacity and the dynamics of population demand. An indirect coordination of activities as regards the amount and variety of produced and planned output would be required. To this end, the establishment of a centralized data bank on goods and demand becomes a priority task. The data bank will have information about production, trade and the population.

Of equal importance is the establishment of a self-supporting design and technological bureau on cultural and household goods, designed as a comprehensive solution to the problem of putting consumer goods production on an industrial basis. The potential of heavy industry and defence enterprises to increase goods output cannot be realized without making provisions for raw resources, the free marketing of materials, technical equipment and machinery; providing for the precise coordination of enterprises activities on supplying completing units; and ensuring appropriate coordination of each product inventory according to a reasonable sound listed products policy.

The transition to market relations requires manufactured goods to be more competitive. We believe that heavy industry and the defense industry have the greatest potential to improve the quality of consumer goods. They could

accomplish this by meeting the following conditions: guaranteeing high quality products which meet both domestic and international standards; increasing investments in new technological equipment, R&D and advanced technology; implementing imported advanced technologies to ensure improved production quality and the mass production of competitive goods; advancing mastered technology ensuring higher quality, a decrease in production costs, and an increase in labor productivity.

Due to the need to implement advanced technologies and expenditure-saving machinery, a number of consumer goods producing sectors would have increased demand for means of labor to produce consumer goods. As production capacities for producing means of production of consumer goods are insufficient and their pattern does not suit existing demand, restructuring should take place. Introduction of market relations at the converted enterprises would make it possible to involve defence industry enterprises in producing equipment for consumer goods production as well as producing their specialized products with the a subsequent re-orientation to civil needs, and the export and processing sectors of the agro-industrial complex.

To this end, it is necessary to perform a comprehensive analysis of the pattern and volume of production, to utilize the potential of commodity exchange activities and to purchase foreign technologies, machinery and equipment. Normalization of the consumers' market and the establishment of favorable conditions for competition development implies stimulating diversification processes, and providing tax credits for enterprises embarking on production beyond their specialization and entering the market with their new products. Diversification is a part of the measures undertaken to develop competition and do away with monopolies at the market. It would ensure an increase in consumer goods production and their variety, overcoming the tendency to raise prices and diminish the inventory of cheap products.

The development of the consumers' market can be created by both increasing consumer goods production within the republic and expanding import. The republic possesses everything necessary, because Kazakhstan has impressive export potential. It has 95% of the chromous ore export volume of the former Soviet Union, 90% of the yellow phosphorus, over 70% of the lead, 50% of the zinc, 60% of the ferrochrome, and a considerable percentage of copper, titan, rare non-ferrous metals and leather. In recent years, along with traditional export goods, Kazakhstan has begun to supply the international market with ferrosilicon chrome, geophysical devices, lamps, new shearing

devices, etc. The most promising avenue to increase export efficiency in the use of natural resources (oil, coal, gas) for balanced exchange of goods appears to be establishing joint ventures to ensure the export of high quality oil products through the use of advanced foreign technologies. This would provide the possibility of better meeting the demand for consumer goods at the expense of export and increasing the raw stock for their production.

Joint ventures with American, Italian and Japanese companies are being established for the chemical processing of hydrocarbons from the Tengiz oil and gas field. An agreement has been signed in Tokyo for a joint venture with the Marubeni company to produce 100 thousand tons of polyethylene and polystyrene using materials from the Tengiz oil field. In May 1992, the republican government and an American company, Chevron, signed an agreement in Washington to develop the unique Tengiz oil field. This is extremely important to Kazakhstan. In July 1992, after a tender was held, the British gas consortium and Adghip signed an agreement to develop the world's largest gas condensate field in Karachaganak. More than 116 joint ventures in different sectors of economy were set up in 1992.

Overseas investments would ensure that the republican economy would be involved in the international system. It should be designed to meet the developmental needs of the republic. This would include setting up production enterprises for integrated raw and waste materials processing, modernization and technological re-equipment of functioning enterprises, etc. Flexible legislation and the establishment of free economic zones (where expedient) are needed to attract foreign investment.

As the reserves of irrecoverable natural resources are not unlimited and the ecological situation in some regions is extremely complicated, Kazakhstan must develop measures to stabilize export supplies along with a simultaneous increase in the all-round utilization of raw materials. The policy of increasing currency reserves requires changes in the export pattern, and eliminating the domination of raw materials in exports. However, this problem cannot be solved in a short time. The transition period should focus on increasing currency reserves at the expense of currency deductions for the assets of enterprises, local governing bodies and the republic. In addition, export of various waste that is not utilized in the national economy should be increased. Along with the export of products and their all-round processing, we envisage re-export of imported equipment that has not been installed and cannot be used efficiently, selling intellectual products, and producing transportation, tourist and other services. As mentioned

above, Kazakhstan's consumers' market is dependent on exports from other republics. At present, agreements on goods supply to the republic are extremely complicated.

At wholesale fairs, trading organizations have managed to buy up cultural and household goods for 1992 for a sum total of less than 3 billion rubles, 2.6 billion rubles less than in 1990. The resources provided by local industry have increased by a mere 7.4%. Given resources account for only 30-40% of the trading organizations' demand for cultural, household and fancy goods, and the shortage keeps increasing. Meanwhile, the demand for cultural and household goods and building materials will continue to have a high growth rate. In 1995, predicted demand will exceed 10 billion rubles, relative to 1990 prices. The share of advanced domestic devices would account for more than 4 billion rubles. Given the trend of recent years, development of production of these goods at Kazakhstan enterprises should be accelerated to ensure an even development of the regional economy. The Ministry of Trade is responsible for providing the population with goods, predicting demand, taking effective steps to increase the output of goods in demand, guaranteeing the market for goods, and procuring missing resources from outside the republic. The Ministry should be granted the right of control and distribution over the supply of all consumer goods output in the republic, including goods that are partially distributed by maintenance supply bodies (cement, slate, petroleum, gas stoves, etc.) and the right to buy up missing goods using the republic's currency reserves.

The total volume of goods exchange is considerably affected by links with other states of the former Soviet Union, which supply 84% of all imported material resources and receive 91% of all exports from Kazakhstan. The largest share of imported goods is provided by the machine-building and metal-working sectors (34%). Meanwhile, 96% of the republic's demand for railway mechanical engineering products is met through export, as is 95% of the demand for machinery used in light industry, 82% of the demand for machinery for the chemical and oil industries, 72% of the demand for metallurgical production equipment, 62% of the demand for metal-cutting and wood-working machines, 61% of the demand for radio-electronic products, 50% of the demand for domestic devices, and 100% of the demand for cold storage plants and refrigerators.

The republic exports 12% of its output. In other words, the largest part of produced material values is consumed locally by non-productive sphere or preserved in the accumulation fund. Most of Kazakhstan's exports consist of

raw materials. As a result of established specialization in the economic complex of the former Soviet Union, the republic exports 70% of its oil, 55% of its iron ore, 24% of its coal, 46% of its ferrous metals, 37% of its non-ferrous metals, 44% of its phosphorites, 55% of its chemical products, 86% of its synthetic rubber, 35% of its asbestos and cement, 51% of its wool products, 27% of its cotton products, 31% of its woolen cloth and 88% of its silk cloth, and a considerable quantity of wool, yarn, raw cotton and other raw materials.

To provide for its own needs, the republic imports 28% of the light industry products it consumes. Imported knitted wear and garments make up 31-34%; cotton and leather goods, 42-48 %; and linen goods 100%. Exports of food industry resources are 16%, and an additional 4% accounts for the imports. Over 300 enterprises have already entered the market. In volume of export supplies, Kazakhstan is the fifth among the states of the former Soviet Union, after the Russian Federation, Ukraine, Belorussia and Uzbekistan. The republic has economic relations with almost all Eastern European nations, with many developing nations (Algeria, Afghanistan, Iraq, Cambodia, Pakistan, Syria and Nigeria) and with advanced capitalist nations (England, Austria, Finland and Japan). Kazakhstan's closest economic links are with China, the former West Germany, Hungary, Italy and Poland.

To provide the market with a complete selection of consumer goods, Kazakhstan imports computing and duplicating equipment, sanitary engineering products, stereo systems, video tape recorders, perfumes, cosmetics, etc. Nonetheless, Kazakhstan's external economic activities do not satisfy modern requirements and available potential. With the transition to market relations, there is a new level of participation in market activities, based on an economically balanced and developed system of international economic links.

During the transition to a market economy, the most important problem is the rational employment of manpower. This is connected to significant pattern shifts and high dynamics of production development and also to an increasing trend to resource-saving and efficiency gain. In the past, because priority was given to increasing the volume of production, which involved more and more manpower, the manpower shortage was constantly exacerbated. In the long run, this caused the slow-down in labor productivity growth and economic and social stagnation, as the republic's economy obeyed the rigid requirements of all-Union Division of Labor and Impractical Employment.

A new approach to manpower under the conditions of a market economy is a result of the characteristic features of the intensive development of productive

forces, the increased requirements for the quality of labor, and an economical utilization of production resources. Correspondingly, the proportions of manpower distribution to the spheres, sectors and forms of activities are changing as well. The transition to efficient methods of property utilization and the development of competition increase the workers' interest in maintenance, careful handling of property, and achieving the best eventual results with least expenditure.

Establishing and developing markets creates conditions and prerequisites for the increased significance of economic incentives in labor productivity growth and the rational utilization of manpower. The system of motivation in labor is undergoing significant changes. The point is limited to stimulation through wages and income gains. Changes in the relations of property are essential. In employment regulation, manpower redistribution between different sectors and regions in economic competition gains ever-increasing significance. Nevertheless, the market economic mechanism produces conflicting effects on manpower utilization. It stimulates labor productivity, but at the same time reduces the number of employed and creates unemployment. Chronic unemployment is a negative side of the modern market economy. Economic production measures and labor market regulation are employed to overcome the rise in unemployment. Therefore, we are to pursue efficient employment and prevent rising unemployment while working towards a socially-oriented market that will ensure the improvement of people's well-being. To this end, market relations should be combined with elements of planned economy, territorial planning and productive forces placement.

It is necessary to more comprehensively take into account the manpower state in the republic and its regions (manpower dynamics, the age and sex composition of the population, professional skills, national traditions, settlement peculiarities) and propose the ways to utilize them rationally. At the same time, changes in education, the vocational guidance system, housing policy, social insurance, job placement and families provision are inevitable. A new approach to investment activities, taxation and fiscal policy is required. One of the most important goals is ensuring an advanced employment structure. The main trends here are the accelerated development of processing sectors, and the priority growth of mechanical engineering, the processing sectors of the agro-industrial complex, light industry and the food industries.

In Kazakhstan, rational employment is influenced by specific demographic, social and economic factors of rural population employment. At present, the

rural population makes up 67% of able-bodied residents, including 39.4% in the southern regions and practically half of the work-bound population. The rural population outflow is sluggish, due to limited employment opportunities in the nearby towns. For example, in the period of 1986 to 1990, 30 small and mid-size towns and 150 large settlements did not undergo industrial development and consequently could not affect the transfer of unemployed rural residents in the industrial sphere. As a result, the number of persons involved in housekeeping and small-holding has considerably increased. Half of the total rural population engaged in housekeeping and small-holding lives in 4 southern regions.

Making Kazakhstan self-supporting in food production through the development of small-holdings could provide a solution of urgent present-day problems of employment in the region and, at the same time, turn out to hinder its development. An individual producer of agricultural products in the southern regions of the republic can make considerably more money than he could in public production, which becomes an important factor in securing employment. It is impossible to change the employment pattern of the rural population through the non-agricultural sphere of employment mainly in the towns. Consequently, to solve the problems of the rural employment, especially in the southern regions, original approaches should be employed regarding manpower peculiarities, national traditions, employment skills and the way of life.

We believe that a new model of rural employment could be formulated by ensuring multi-mode employment in rural regions through extensive diversification of state-farm and collective-farm production, and an optimum combination of agricultural and industrial labor and labor in the non-productive sphere, aimed at increasing the employment rate of women and youth; the creation of combined agro-industrial structures in large rural settlements and small towns which are accessible to transportation facilities, to be targeted at the organic unity of agricultural production and its industrial processing, transportation and sale. To this end, within the next few years, industrial production of appropriate machinery and equipment should be developed on the required scale.

With this end in view, the republic's market could be opened to foreign companies that would sell the required agricultural machinery. The republic can improve the rural employment pattern by making it more reasonable and considerably increasing employment in the non-productive sphere by expanding the social capacity of rural settlements, and can create an integrated system of medical, cultural, domestic and trading services for the rural and urban

population in the regions situated close to towns with a developed road network. The most promising trend seems to be in the concentration of non-productive enterprises in large populated areas and improving regular transportation service between rural settlements and the nearby towns. This approach can be explained by the fact that under the existing system of settlements, establishing non-productive enterprises and institutions in every rural settlement is hardly expedient. Mobile services could considerably enlarge the inventory of services and improve their quality and accessibility.

In the near future, one of the key social and economic problems in Kazakhstan will be the re-orientation of investments towards the creation of a developed consumers' complex. Capital investments in agriculture, production infrastructure, the development of light industry and food enterprises, trade, and housing construction are to be increased. The resultant gain in consumer goods production would allow Kazakhstan to normalize price dynamics, credit, financial, monetary and goods markets and the market as a whole. It provides an opportunity to secure new jobs and would act as an efficient safety net in case of unemployment as a result of bankruptcy or enterprises closing.

Tax benefits are another effective lever to stimulate the solution of social and economic problems of ensuring rational employment. The following option of favorable taxation seems to be more acceptable: for the first year a new enterprise, especially if it produces consumer goods, pays no taxes, in the next 3-4 years it pays 50% of the tax. Favorable taxation is maintained until the enterprise achieves full capacity. These benefits could be expanded to enterprises employing young people and mothers with many children. Solution of these problems under new economic conditions is within local Soviets jurisdiction.

The "small economy" sector, i.e. the number of small enterprises, might evolve as one of the factors ensuring rational employment. This is a very relevant issue in Kazakhstan. The republic should pave the way for the establishment of small enterprises by developing clear rules, and introducing state-backed measures, including tax benefits and supplying material and technological resources, facilities and equipment. Under local conditions, the small enterprises are supposed to be targeted at increasing consumer goods output, including production based on waste utilization. The social aspect of small enterprises establishment is no less important.

At the threshold of social deep changes and the transition to regulated market relations, a developed network of small enterprises in every sector of the national economy would help involve the released manpower in production

activity and prevent unemployment growth. The small enterprises are supposed to be transformed into shops and subdivisions of big enterprises. This step would make the republic's economy structurally flexible, promote the elimination of monopolization and create a rapid response to demand changes. An important feature is that local resources and production waste utilization would improve with low capital consumption and rapid recoupment of investments.

Along with the development of small enterprises, private enterprise, with its flexibility and mobility, seems to be a very promising model of employment insurance. Private enterprise has great potential to solve many urgent social and economic problems in the republic, which would considerably increase resources utilization efficiency while guaranteeing employment. However, like any other new useful business, private enterprise needs support from the society. Therefore, the state should defend the interests of entrepreneurs, provide the necessary environment for normal production and trading activities in the interests of every social group, and ensure equal opportunities for all those willing to go into business. Most important is protecting the entrepreneurs against any limitations imposed by red tape.

CHAPTER XIII
THE WORLD TRENDS IN NATURAL RESOURCES UTILIZATION AT THE TURN OF THE TWENTY-FIRST CENTURY

The end of the twentieth century is rapidly approaching. The final results will be summed up taking into account the current decade; however, we could estimate quite a few principal positions of the past century as regards resources involvement. The amount of natural resources involved in this time-frame is comparable with that of the past thousand years. Thus, world production of the most important industrial materials has increased ten-fold, a hundred-fold and even a thousand-fold during this period, and some materials, such as aluminum and plastics, have found industrial application only in this century. The qualitative side of resource-saving is even more important. In the course of scientific and technological revolution, practically every element of the biosphere and in recent years even those of near space are being rapidly involved in economic activity. At the same time, as was pointed out earlier, the reproduction function of resource-saving and the practical significance of resources economy have been increasing.

Analysis shows that the potential of resources involvement in economic activity has always been characterized by a number of limitations. The most significant factors of resource-saving, waste-free production have been and continue to be the availability (or lack thereof) of raw materials, semi-finished products of a required quality, machinery and equipment for optimum processing, power supply and, finally, the availability and professional skills of the labor force. However, the age of specific productions autonomy is ending. This manifests itself worldwide, in manufacturing, agriculture and the service

industry. An ever-increasing significance is acquired by the productive and social infrastructure, which determines the end results of economic activity. The infrastructure strengthens society's economic potential, with scientific achievements and funds utilization practically outrunning industrial production in basic sectors, as is the case in the United States and other advanced countries.

Finance, transportation, trade, communications, supply, and maintenance service for production systems (such as computers and complex technological devices) are gradually becoming units in an integrated information and production system with a global character. A trend towards interchangeability of the production processes and its final products is gaining strength. It might be asserted that the commercial and manufacturing achievements of a society are the result of a complex succession and systematic totality of social, natural, engineering and technological processes. Advanced countries successfully regulate optimum resources consumption when creating modern production cycles and maintain the existing ones through economic legislation and the specific natural, climatic, moral and ethical aspects of labor activity. In this respect, we should note the following peculiarity of the world market: its ability to expand reproduction of innovations with a consumer-oriented producer. On the other hand, both individual nations and international groups skillfully protect the existing production.

These facts have been known for a long time, but they have not found practical application in this country. Only a few institutions and experts were active in the international market, and this has negatively effected the former Soviet Union's participation in the global economy. Therefore, under present-day conditions it is important to develop reasonable means to secure a leading position in the world.

Radical production restructuring based on resource-saving should pay more attention to coordinated estimates and recommendations issued by international organizations such as the UN, the EEC and others. Agreements about the atmosphere, territorial waters, coastal zones, toxic substances, protecting workers against harmful effects of the workplace, and so on, can be developed and implemented. These agreements should be in line with international assessments of the influence of potentially harmful processes that are taking place in the CIS.[3]

3. Thus, a report of the United Nations International Committee on Environment and Development was published in New York in 1987 and in Moscow in 1989.

The authors of an analytic review entitled, *From Common Earth to Common World*, indicate the opportunity to begin a new era of economic growth based on a policy of optimum utilization and expansion of the natural resources base. The authors outline possible trends of international cooperation development. They emphasize that within the recent decade the environment quality in a number of industrially advanced countries has considerably improved. However, few nations have achieved this success and instances of pollution which earlier were limited to the local level have become regional and even international problems. Given the trends of social and economic growth predicted for the next century, it has become necessary to strengthen measures to reduce, monitor and prevent industrial pollution. More and more nations are becoming aware of the interrelationship between a clean environment and an efficient economy.[4] Natural resources reserves no longer satisfy the ever-increasing needs of industry, the infrastructure and domestic consumption. Therefore, state programs are necessary to efficiently promote the rational natural resources utilization in two principal directions. One direction is protection, recovery (**whenever possible**) and improvement of the functioning of natural systems which are the source of resources reserves. The second category includes regulating the utilization of resources that cannot be reproduced, including the development of alternate sources or substitutes.

Implementation of these most important trends is not possible without fundamental comprehensive research and substantial investments from the state, international corporations and funds. In every country, the legislation on

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Moscow in 1989. The UNICED recommendations have become well-known and were approved by the UN General Assembly. The were forwarded to the governments of the member nations with a request to take them into consideration while developing their programs and policies. See: **Our Common Future,** Report by the International Committee on Environment and Development (Moscow: Progress Publishers, 1989).

4. The experience of recent years in the field of natural resources utilization (both in individual countries and in the region as a whole, including, in addition to Europeam nations, Turkey, Canada and the United States) is presented in: **A Strategy of Environmental Protection and Natural Resources Rational Utilization in EEC Countries, Part I: Trends and Policy in Environmental Protection in the Regions of UNEEC** (New York: 1987).

environment and resources rational utilization needs substantial changes. Many nations have passed resource-saving and utilization laws.[5] It worth mentioning that legislation is often influenced by international legal acts. For international cooperative activities in the sphere of resource-saving, scientifically grounded predictions are of considerable significance. For example, *General Economic Prospects up to the Year 2000* gives a more comprehensive analysis of the dynamics of trends affecting the rational supply of energy and raw materials to the international community.

The question of how long the explored reserves of irrecoverable raw materials will last is of utmost importance. The answer is somewhat promising, testifying to the fact that in the case of appropriate investments in minerals exploration, their reserves would correspond to the dynamics of rational consumption. In any case, until the end of the century (and, possibly, in the more distant future) there would not be an acute shortage of natural resources caused by the depletion of mineral reserves or a drastic increase in production costs. As is well known, there were periods when Kazakhstan had a shortage of raw materials. However, those problems were solved through scientific and technological achievements, including discovering and developing new raw materials; substituting artificial products for the natural ones; concentrating low quality resources; recirculating waste; replacing scarce raw materials with abundant ones, etc. There is every reason to believe that problems of raw materials shortage could be solved in the future as well.

A vitally important condition of the scientific and technological revolution is an expansion and intensification of international economic, scientific and technological cooperation, including the international division of labor, and widening production specialization and cooperation. It is expedient to dwell on another essential problem. Earlier episodical efforts were aimed at fighting environmental pollution. Only later did people become concerned about the biosphere and protecting its ecological systems. Therefore, the regional strategy developed by UNEEC emphasized the interrelationship between environmental quality, natural resources utilization, economic activity and social development. In short, ecological resources should be treated on a par with energy and raw materials resources.

5. Thus, in 1976, the United States passed a law on resources protection and recovery (amended in 1980 and 1984). In 1980, the United States passed legislation about the environment, compensating for environmental damages and responsibility for the environment (Superfund).

Experience has proved that the mid-range and long-term benefits of environmental protection can exceed expenditures. A comprehensive analysis of expenditures and benefits is necessary to predict the material consequences of various alternative approaches to economic and social development. Priority attention should be given to passing and implementing nature protection legislation, to formulating a more comprehensive assessment of factors affecting the environment, to improving monitoring and statistical control of the environment, and to expanding ecological research and the development of low-waste and waste-free and waste utilization technologies.

Waste minimization is a basic element in developing a rational strategy for natural resources utilization. Ecological aspects should become a central part of our knowledge and activities. Heightened consideration for ecological prospects and a more profound understanding of the technological interrelationship between people and nature are vitally important. Personnel training and education play a significant role in changing the pattern of national consumption and re-orienting our life-style towards a maximum reduction of waste and pollution. Alternative approaches linking community-based social and ecological problems depend on awareness at all levels. Information and communication gain ever-increasing significance.

In June 1992, Rio de Janeiro hosted the most representative ecological forum in history - the International Conference on Environment and Development, with the participation of delegations from over 170 countries. Important position papers about matters of world ecology were approved for the late twentieth and early twenty-first centuries, including a convention on protecting the climate against the hothouse effect. Policy makers should pay careful attention to these papers when they formulate economic and social policy.

All states of the former Soviet Union, and particularly Kazakhstan, have a high degree of non-ferrous metallurgy development. The republican enterprises were producing (relative to the aggregate output in the former Soviet Union) approximately 70% of lead, 48% of zinc, 28% of copper, 40% of titan, 32.5% of magnium, and 20% of alumina. Despite considerable difficulties, a pronounced orientation to raw materials in Kazakhstan's non-ferrous metallurgy industry should take a rational turn. This is one of the basic sectors determining both a steady functioning of traditional enterprises and the establishment of new trends in radio-electronics, space research and elsewhere.

Hence, the most important international trends in non-ferrous metallurgy development are in the field of metal recycling. Thus, in 1989 the average share

of secondary metals worldwide was 33%. Secondary metals accounted for 36.4% in the United States, 61.3% in Japan, and only 25% in the former Soviet Union. It is a well-known fact that metal production from secondary sources (scrap) is far cheaper and better for the environment. The rapid decrease in the average metal content of ores, both in his country and worldwide, is another important factor. Not all metals are equally suitable for recycling. Recycling metals is a priority trend, and this also holds true in the CIS.

Non-ferrous metals which were negligently left in the environment frequently act as biologically active toxic materials. Therefore, huge mountains of waste from mining and the metallurgical industries must be recycled in the future. Table 24 shows the volume of the waste in the CIS. Recycling technologies for mining and metallurgical waste are varied and recycling can be very profitable.

Table 24

Dynamics of solid waste accumulation in mining and metallurgical production at the non-ferrous metallurgy enterprises in the former Soviet Union

Kind of waste	1976-1980	1981-1985	1986-1990
Stripped and holding rocks, mln. cubic m	4700	6850	8600
Final rejects, mln. tons	1606	3075	3677
Dumped slags, mln. tons	315	380	432

A greater significance is acquired by the utilization of a so-called consumption waste, which is increasing with the growth in the standard of living. More advanced nations have gained experience in utilizing consumption waste, producing both an ecological and substantial economic effect. Natural resources utilization efficiency under the market economy should be based on an adjusted economic mechanism and market regulators while an efficient resource-saving mechanism aimed at establishing waste-free productions and technologies should cover primary levels of production, regions and whole countries. This mechanism will consist of three units: production preparation, development prediction, rating and investments; economic levers to support production (financing, pricing, incentives and sanctions); and economic grounds for

management with clear requirements for ecological management.[6]

Thus, resource-saving strategy goes hand-in-hand with the strategy of natural resources utilization. Efficient natural resources utilization is important to our physical, psychological and social welfare. We should direct all the potential of science and technology, as well as economic and social development, to this aim.

6. Ecological management is especially essential dangerous ecological conditions, which at present affect 26% of the population. The ecological disaster zone covers 4 milliom square kilometers of the territory of the former Soviet Union. The largest zone is in Kazakhstan.

CONCLUSIONS

The above research into problems of resource-saving under conditions of the transition to a market economy allows us to draw both theoretical and practical conclusions. Firstly, the research has revealed the growing influence of resource-saving on economic growth rates, production efficiency and the standard of living. It is safe to say that a trend towards the maximum savings of raw materials, fuel, energy and other material resources is gaining strategic significance as an extremely important factor in Kazakhstan's social and economic development. In the future, the national income increase must be ensured largely at the expense of resource-saving, while in a number of areas the output increase could be attained by reducing the consumption of raw materials, fuel, metal and other basic materials. This is essential for Kazakhstan, a republic with a very large mining sector. Secondly, the trend toward resource-saving based on scientific and technological achievements and market economy gives us a more precise definition of the established theoretical models of extended reproduction and the practical uses of these models. A shift to resource-saving development of public production with a large-scale utilization of waste-free technologies would ensure the priority growth of output, change established proportions of consumption and accumulation, and accelerate the processes of economic social re-orientation. Resource-saving should take place in all stages of the reproduction cycle, including its strategic parameter and optimum investments utilization.

Thirdly, the concept of resource-saving production development based on

production engineering and technological modernization should be integrated. This would account for both productive forces development and a radical improvement of production relations in ensuring maximum social and economic effects. Integrated resource-saving programs are aimed at providing common activities and purposefulness for enterprises and institutions with different forms of ownership. To guarantee optimum resource-saving under the process of social and economic restructuring, Kazakhstan must fully develop market levers for exerting influence and economic incentives. The transition to a socially-oriented market economy in Kazakhstan must employ long-term programs of optimum resource-saving.

Fourthly, predictions of resource-saving in the republic's national economy reveal huge potential which is very slowly put into operation. Preliminary predictions carried out in 1990 showed a practical feasibility of increasing the aggregate national product by 24% by 1995 and the national income used for consumption and accumulation by 27%. Other steps were to cut the material consumption of the aggregate national product to 0.97 (relative to the level of 1990), to increase social labor productivity by 25% and per capita national income by 20%. Crisis phenomena in the economy, connected with the collapse of the Union national economic complex and radical social and economic restructuring, have impeded the implementation of these plans. Nevertheless, in the future, if the economic situation in the republic is stabilized and the trend towards resource-saving is pursued, economic growth rates might be higher and the level of social production efficiency and consumption would gradually approach international indicators.

Fifth, the implementation of a resource-saving economy considerably depends on establishing a new economic environment. The devolvement of various forms of ownership and market relations should be backed by creating more viable production patterns which would eliminate the producers' monopoly and the workers' alienation from their labor results. While making economic models of resource-saving, it is expedient to take into account not only the profits gained (partly due to unjustified excessive prices), but also the reduction in production and marketing costs. Special consideration should be given to shaping a system of indicators to characterize the efficiency of crediting the resource-saving trend of production development and joint ventures activity. For Kazakhstan, as well as other states of the CIS, creating a resource-saving market infrastructure is a major concern.

Sixth, material resource-saving and rational natural resources utilization are

evolving as international economic problems not only as regards consumption, but also from the point of view of creating a favorable ecological environment for the population. To this end, Kazakhstan must solve a number of economic and legal problems and study the international experience. The logic of scientific and technological progress and social development as a whole orients resource-saving in the future towards waste-free production and allocating a substantial share of investments for implementing environmental protection programs.

While overcoming the hardships of the transitional period, it is necessary to develop positive trends in economic development, such as making economic relations between enterprises more rational, optimizing the national economic pattern, expanding mutually advantageous cooperation with the CIS states and the international community. Here, initiative by working collectives at state-owned and cooperative enterprises, new commercial structures and private enterprises is evolving as a key factor. While developing market forms of production activities, it is essential to ensure a favorable environment for competition in replenishing the market with high quality goods while reducing their production costs through resource-saving and labor productivity growth.

In restructuring our economy it would be expedient to attract large-scale capital from foreign states, banks, companies and international organizations, along with our own sources of investments. To this end, the Kazakhstan National Agency of Overseas Investments has recently been set up in Alma-Ata. A maximum use of resource-saving potential with regard to the new scientific and technological trends in production, market relations and new forms of economic activities and international trends in natural resources utilization must become a central link in the economic policy of state and governments, and regional and economic institutions of all levels.

Completion of this book coincided with the need to work out a strategy for the Republic of Kazakhstan's development as a sovereign state. By now the strategy has been developed and published.[7] It contains the following premises. Transformation of society and its political and economic relations are becoming more and more purposeful. The development of democracy, the reformation of forms of property, and the trend towards a viable market are recognized as the only means of leading the economy out of the crisis situation, a necessary condition for establishing a prosperous national state. Following this trend, it is

7. Nazarbayev, N.A. **A Strategy of Kazakhstan Establishment and Development as a Sovereign State** (Alma Ata: 1992).

essential to reasonably estimate actual conditions and adopt a considered and practical approach. All social transformations ought to be realized in conformity with people's psychology and traditions. We must also consider the vestiges of the totalitarian regime that remain in our conscience and behavior, factors which we cannot rapidly overcome, as much as we might want to.

Resource-saving problems have found an actual implementation in strategic targets and the conceptual social and economic model of Kazakhstan development. Economic strategy and tactics - which is the key sphere of social life - involve the sustained transition to a market system while overcoming structural and technological backwardness. These problems would place a heavy burden on even a stable economy. They are intensified by the fact the CIS states, including Kazakhstan, are experiencing a complex economic crisis caused by political, economic and systemic factors, including the dead-end command economy and errors made by leaders of the former Soviet Union.

A vitally important question on the agenda is how can Kazakhstan overcome this crisis, stop the recession and create an upswing? Foreign investments could play a positive role here. However, practical experience proves that it would be a mistake to rely mainly on external factors. Until now, large-scale aid through credits has not gone beyond promises. There are objective reasons for this, such as instability, war, and the lack of certainty about with whom to deal, whether the weakened center or the republics that are gaining strength. Long-standing uncertainty about credit terms and aid is restraining our initiative and preventing us from making bold basic decisions.

The only solution to this crisis situation is to depend on our own powers. We must emphasize our own producers and investors and provide aid to those who work and produce, save and invest. If we fail to do so, the result will be economic disaster. The republics of the former Soviet Union would be in the humiliating position of being economic colonies to advanced nations. This unpleasant prediction is in line with reality.

It could be argued that if certain politicians in the CIS laid aside their political ambitions and futile games and combined their powers, it would be much easier to get out of the crisis. After all, our economies are tightly interrelated and it is extremely unreasonable to break the ties on the only ground that every member of the former Soviet Union has turned into a sovereign state, an equal member of the UN and other international organizations. Most nations guided by common sense are working towards integration, while we are zealously cherishing former grudges, at a time when the totalitarian center has

collapsed and the disintegration process continues to intensify. This does not do us credit.

Kazakhstan has always been prepared to undertake joint efforts to get out of this crisis situation, and has been willing to employ both economic and political methods to achieve this. However, most partners in the CIS have not backed our initiative. Therefore, although we remain ardent adherents of integrated efforts, we are compelled to find an independent solution to the situation, namely, to make the transition from a policy of integration to the policy of coordination with the CIS states. This policy will instituted in a calm and orderly fashion. Many nations have embarked on an economic recovery program without even a small share of what is available to us today.

Kazakhstan has many advantages. It has a wide range of mineral resources, ensuring reliable raw materials for practically any type of production. In addition, vast areas of arable land could change Kazakhstan into a major food exporter, even to the world market, if land reform is implemented. Thirdly, Kazakhstan enjoys the availability of a sufficiently developed production potential and a qualified labor force in every sector of industry. Fourthly, the country boasts a treasure trove of scientific ideas, discoveries and inventions. These ideas have not received state support because of red tape; the bureaucrats have not been eager to take risks and have been incapable of transcending traditional notions.

The first fundamental strategic conclusion is that to overcome the mounting crisis and restore the economy, it is necessary to rely on our own potential. There have been more difficult periods for Kazakhstan, and we managed to overcome the obstacles. The second equally important conclusion is that progressive economic restructuring, designed to overcome our technological disadvantages, is made possible by choosing appropriate priorities and implementing them through resource-saving and a new mechanism of economic incentives for developing promising sectors.

Kazakhstan has the following priorities in this field: meeting the market demand for foodstuffs and consumer goods; boosting construction and the construction industry, especially in the area of housing; creating complete conversions in ferrous and non-ferrous metallurgy, designed to partially replace the extraction of raw materials and their domination of the economy; developing hi-tech productions and machine-building; initiating measures for the diversification and conversion (if necessary) of defence industry enterprises; implementation of ecological technologies; and creating a modern infrastructure

(transportation, communication, energetics, tourism, hotels, etc.).

These priorities would be implemented through special state programs based on indicative plans and developed with the participation of new organizational structures. The republic will develop and implement state programs that are designed to do the following:

1) To meet the market demand for consumer goods, including foodstuffs.

2) To develop Kazakhstan's export potential. This program would be responsible for establishing complete conversions in industry, hi-tech productions, and developing and restructuring the defence industry.

3) To concentrate on the production of goods to replace imported goods, which would simultaneously solve the problem of currency reserves.

4) To undertake extensive construction and housing sales. This program should change traditional approaches to the housing problem and create a housing market which would provide a very important component of the market infrastructure.

5) To implement infrastructure development.

The implementation of these five programs would help solve Kazakhstan's ecological problems. Foreign investors would be involved and would provide Kazakhstan with modern technologies. Comprehensive inspection will take place before every project, in an effort to prevent ecological disasters, accidents and other unbalances in the ecosystem. Because there is a shortage of domestic experts in this field, we would have to engage the services of foreign firms on a long-term basis. Along with contracts inspection and consultations they would assist in personnel training and choosing ecologically safe technologies.

The principal objective today is to revive incentives and people's motivation to work. Kazakhstan must encourage people to work and earn, and to believe in the creative function of the market. The only way to accomplish this is to provide an abundance of goods. At first, people should be allowed to satisfy their moderate vital needs, especially in foodstuffs, without any restrictions whatsoever. The development and restructuring of the agro-industrial complex and implementing measures to meet the consumers' demand for manufactured goods would become the top priority.

The government is working on designing a national program to develop small agricultural industries to solve this problem. This program calls for building 1100-1200 small enterprises in rural regions, using compact equipment and subsidiaries of urban industry. This program would reduce the losses of agricultural resources, provide for the local production of high quality goods,

and create prestigious jobs for young rural residents. It would promote industrial renewal of rural regions, and create a community of rural engineers, technicians and businessmen. Parallel to this, the abovementioned housing program would be formulated and later implemented. Both programs would be run by banks, a common practice in countries with market economies. To this end, capital would be contributed by shareholders, represented by enterprises, local authorities and private individuals.

The republic also needs special programs to manufacture goods, which would receive ongoing state support. These programs would shape Kazakhstan's future participation in the global economy and would involve perhaps 10-15 types of goods and 3-5 hi-tech items. According to the American experience, all the programs listed should be registered under special laws.

The experience of advanced nations illustrates that we need short, medium and long-term plans and predictions to help the government consistently analyze and monitor Kazakhstan's economic growth in a certain time period. Important components of this strategy are Kazakhstan's restoration and development rates. A number of states have successfully implemented a strategy of rapid economic growth, including former West Germany, Japan, South Korea, Singapore, Taiwan, and Hong Kong. These states were originally in a much worse position than Kazakhstan is now, except for the fact that Kazakhstan has no direct access to sea and ocean routes. This fact, coupled with mega-trends in science, novel technologies and management, integration, and international economic relations, indicates that Kazakhstan's transitional period could take as little as 15-20 years. This step is necessary, for our own sake, for the sake of our children and that of our grandchildren. This requires an increase in the pace of work. The only route leading to progress and development is to consistently surpass what has been achieved previously. Unfortunately, many people are unwilling to do something new or to add to what was produced yesterday. According to data from 1990, labor productivity is lower in Kazakhstan than that in Pakistan, Thailand, Turkey and Iran. Selfless devoted labor is not yet another propagandistic slogan , but a necessity for living a decent life. Only people with initiative and ambition, who work hard day after day, are "making it." That is the task that we are face and must solve.

Now that we have every reason to succeed, we must make the most of every opportunity. The strategy of rapid development will be the economic ideology of the entire society, and every person who regards Kazakhstan as his Motherland and is ready to participate in the hardships of the transitional period

and the joys of prospective well-being will support this ideology. The market economy is like a railroad which must observe a rigid time-table. The journeys are made of different legs and each leg of the journey has its corresponding problems.

The first leg of the journey lasts from 1992 to 1995 and must be marked by two processes of macroeconomy stabilization: intensive property privatization and flooding the consumers' market with goods. During this period, property ownership is to undergo profound reforms at practically every state-owned establishment, excluding those with strategic and defence significance. Privatization of small and mid-size enterprises in various sectors of industry will have been completed by the middle of 1994. Public services establishments and the housing sector are to be privatized by late 1993. These steps, along with an intensive anti-monopoly policy, would ensure the strengthening of the private sector and entrepreneurs. Other elements include local concessions, long-term leases and land sale to foreign investors to be used for advanced technological projects.

The initial power for the stage of reviving and advancing the economy is in our internal reserves. It is therefore essential to consolidate them in order to overcome the departmental and sectoral isolation of the enterprises, to efficiently accomplish technological and economic integration, and to involve private business. Starting this year, the government is to develop a program of involving and utilizing foreign investments, and importing and implementing imported technologies regarding the chosen strategy and priorities. As regards state credits, this program will help to regulate the involvement of foreign investments in recouping projects, prevent a dangerous increase of overseas debt, and consistently monitor the gold and monetary funds of the state. A system to insure foreign and domestic investments, common all over the world, is to be introduced. This would guarantee a timely repayment of credits and help Kazakhstan win the reputation of being a reliable partner.

At the same time, a detailed revision of the republic's scientific and technical potential must be carried out to reveal completed advanced research projects and establish joint ventures ensuring that scientific research will be performed and its results will receive rapid commercial implementation. Kazakhstan must take practical and ongoing steps to establish a spring-board for future technological breakthroughs. These are objective prerequisites for establishing priority development zones in the suburbs of Alma-Ata and Pavlodar, technological parks or technological cities of international significance

at the Semipolatinsk proving ground and the Baikonur space-vehicle launching site, and innovation centers in Karaganda, Ust-Kamenogorsk, Akmol and Atyrai.

During the second leg (1996-2005), Kazakhstan would continue to overcome its dependence on raw materials extraction and processing. This period will be characterized by the accelerated development of telecommunications and the transportation networks, and establishing advanced commodity and money markets as well as capital, labor, securities, and intellectual property markets. The realization of Trans-Asian trunk-line project, extending from the Pacific Ocean to Bosporus, and the construction of a modern international passenger and freight airport in the vicinity of Alma-Ata have priority. These two projects would accelerate Kazakhstan's joining the international economy, help the republic realize its geopolitical functions, and make Kazakhstan the bridge between East and West, Europe and the Asia-Pacific region. During the second leg, the following motive forces and incentives for intensive economic development are to mature:

- fully-fledged market mechanism;
- true freedom for all producers;
- rational natural resources utilization;
- rapid implementation of high technologies and realizing an appropriate position in the world economy;
- consultation with experts about domestic and international business issues.

The third leg would last 5-7 years and would be characterized by the accelerated development of an open economy. This would encompass achieving the strategical objectives of the transitional period, consolidating Kazakhstan's position in world trade and upgrading it as a new industrial state. As market relations are being shaped, the problems of budget deficit and currency convertibility would be solved. The state would preserve only those functions which it exercises better than any other structure, including the market The former system of economic information has been proved invalid for economic processes, as it does not suit the new relations of production. The possibility of obtaining required information from the enterprises was undermined by the Bill of Enterprises. Therefore, to set up an integrated information system meeting international requirements, i.e. including information on the state of assets, solvency, prices, prime cost and other indicators, the enterprises must be legally committed to supplying true information to statistical institutions and banks.

After the problems of the transitional period have been solved, a new economic strategy is to formulated, taking into account Kazakhstan's new role and position in the international community. Realization of economic problems implies a clear-cut program of social development. First of all, steps must be taken to counterbalance the factors causing inflation and reducing real income. This can be achieved by expanding commodities and services output, checking the growth of income and diverting it from everyday demand to securities, housing constructions, durable goods, etc.

During the transitional period, the state will focus on the social protection of the population of Kazakhstan. This requires the state to establish and support a social safety net for the disabled and needy, including pensioners, invalids, large families and students; to support science, culture, education and health services; and to provide social guarantees to the unemployed. Serious attention must be devoted to establishing an employment service that would help minimize the negative consequences of unemployment, which can be aggravated by intense competition, bankruptcy and other market attributes. Every region, province and town must design a program to secure additional jobs. We should improve retraining for unskilled workers and specialists with academic degrees, upgrade the housing market, and control migration within and beyond Kazakhstan's borders. The realization of these trends will be based predominantly on budgetary allocations, various social funds and charity.

Economy reformation in Kazakhstan requires the active participation of the population. This involves educating a more involved generation and adapting new structures to a market economy. All the people in Kazakhstan must have an idea of the conceptual trends of development and perceive the particular steps in their strategic interrelation. The world economy must be a factor in establishing fundamental economic, social and political trends and in choosing prospective directions. This requires a mechanism of mutually beneficial advanced resource and power-saving technologies, which would eliminate obsolete models of economic development. Civilized market relations are necessary for the strategic option of development, and implementing a new and efficient model of socially-oriented economics in Kazakhstan, the states of the former Soviet Union and the entire international community.