

« IN THE NAME OF GOD »

## **Technology Approach in Industrials and Mineral Sector of Iran.**

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Achieving and utilizing experience based knowledge in industrial and mineral sector, especially in developing countries, has been of great importance. Through utilizing of knowledge based management, the industrial and mineral development and growth of these countries could be considerably accelerated. Today, economy based development has been replaced by technology based development and consequently has affected the world economy through drastic increase of added value resulting from utilization of more advanced technologies. However, the strategy of achieving economic growth and its subsequent social welfare through development and approaching advanced technologies as the essence of development has acquired its position among the new concepts of the global management.

Sustainable development has some quantitative elements such as sustainable production, sustained products which necessitates proper quality, competitive price, good services and sustained characteristics. By utilizing the appropriate technologies, the way of achieving the said elements and producing more added-value could be smoothed. The strategy for import substitution is not acceptable. In fact, considering only local and internal market, while ignoring the competitiveness, will practically deviate the developing countries from sustainable development.

For a sustainable development, the bench marking shall be defined globally and compared with international measures. This will highlight the strength and weakness points and cause to move towards production with higher productivity and effectiveness. In line with the above, the technical standards shall also be taken into consideration and shall be upgraded while comparing with international standards. For developing countries, approaching to the new and advanced technologies is much easier than adopting medium technologies and its dependent industries. In medium technologies, the required volume of investment would be considerably high and lots of constrains exist in seeking suitable markets and penetrating into formed clubs for even with quality products and high competitiveness.

However, the advanced technologies due to creating high added value may be adopted even in small scale industries which require lower investment, and in the meantime, due to better space in global markets have better competitiveness. In this regard, expansion of the international transactions will greatly accelerate the process of such technologies in developing countries. The innovation and creativity hidden in the substance of the Iranian people can play a significant and key role in increasing the flow of technology in industrial and mineral sector. In this regard Nanotechnology can be referred to as one of the technology causing for the world industrial revolution. Utilization of Nanotechnology increases the product competitiveness through adopting the said in existing manufacturing lines, could be one of the managerial solutions in Iran industries and mines sector.

The selection and application of such types of advanced technologies is of crucial importance. Comparative advantages, potentials, special conditions of the country as well as priorities shall also be taken into consideration when selecting the suitable industrial technologies. Information technology, advanced materials, Biotechnology also follow this concept and policy.

One of the other important parameters in sustainable industrial development would be safeguarding the continuous and counterbalance relation between technology and design processing. In principle, utilization of technology shall lead to an industrial design. Increasing designing potentials are essential in achieving industrial development. Production expenses will be drastically increased if we do not enter into design stage or depend on imported designs, while ,high added value may be obtained through adoption of suitable designs to establish conformity between new technologies and specific requirements of the country and customers.

Furthermore, the creative potentials of the talented youth of the country shall be utilized for technology promotion, export development and rendering services in international markets specially is neighboring countries. Utilizing the added value resulting from designing in industrial and minerals investments projects could be included in developmental programs. As a whole, strengthening of the structure of industrial designing and utilizing the creativity in this field could be one of the important elements in sustainable development of industry. In this regard collaboration and integration with potential international enterprises for promotion of designing capabilities and to put it in the same direction with new technologies will be fruitful.

Fortunately , the document of country strategy for industrial development has been compiled , however , the required amendments for the conformity with strategy based on the experiences gained through enforcement of the strategy is essential. This document emphasizes on important parameters and guidelines such as competitiveness, sustainable development, proper utilization of advanced technologies and technology development in line with global direction. As a consequence, the country will achieve its deserved share in global market through its potentials, resources and comparative advantages which are higher than the world average. Also changing comparative advantages to competitive advantages.

Research and development projects and centers in the industry and mine sector of our country have a determining role in creating, transferring localizing and developing of technology. Existence and sustainability of manufacturing and developing is greatly dependent on R&D. Industrial development strategy, with respect to intermediate industries which depends on country's comparative advantages such as minerals, oil, gas, fossil fuels energy resources, emphasizes from basic research until the commercialization of the results. However, with regard to certain consumable industries, transferring, localization and development of technology and its effective application with due consideration to conditions and potentials of the country are concerned.

One of the key factors in industry and mine sector, is environment and its related standards. Attention shall be paid to "dual economy considerations". With respect to the environment, not only the matter of the pollution and contamination protection is concerned, but in the meantime , solutions such as changing fuel type consumption by industries and mineral energy and fuel savings as well as application of more appropriate technological process shall be taken into consideration. Through the above solutions, while reducing the pollution, production cost will also decline. By applying this "dual economy considerations" methodology, changing production parameters and condition in factories and offer industrial and mineral plants, we will witness considerable decrease in costs.

Furthermore, by elimination of pollution and contaminations in production systems of these units before dissipation, we may access to more clean products. In this case, the subsequent investments to compensate the losses resulting from demolishing the environment parameters will decline. As a matter of fact, type of the applied technology and reducing the inputs would also result increase in productivity. Needless to say that the environment is not an abstract matter, and various countries shall consider this matter in accordance with their own conditions and comparative advantages. As for Iran,

considering its huge gas resources, strategy of dual economy considerations may be applied in various fields through appropriate planning and effective utilization of such resources. Gas is not only a source of energy but is usable as a raw material in certain industries such as petrochemical and steel industry. In this connection, application of advanced technologies also would reduce pollution and provides required ground for qualitative and quantitative improvements and increase productivity resulting from investments.

The spatial plan for industrial and mineral sector would very much assist in this regard.

Through planned location of industries and proper land utilization, by taking into account the potential and needs of industries and appropriate technology, investment productivity and logical, land development is achievable. I would name some of the following measures which have been taken by the Ministry of Industries and Mines to fulfill the macro objectives of knowledge based and sustainable industrial development:

- Compilation of document related to Industrial development.
- Strategy and compilation of strategy related to its selected sub sectors. The strategy emphasizes on requirements for its implementation such as preparation of proper environment including legal, cultural, economical, financial, research and technological development environment
- Compilation of document productivity development of industrial and mineral sector.
- Compilation of document related to research and technology development in Industrial and Mineral Sector.
- Nano and information technology strategy and long term development plans.
- Implementation of comprehensive technological projects in Industrial and Mineral Sector.
- Compilation of spatial plan in Industrial and Mineral Sector.

- Establishment of advanced research centers for certain industrial and mineral fields.
- Establishment of the trust private sector research fund with government share. The society of Industrial and Mines R&D with about 1000 members.
- Establishing specialized companies in the field of advanced technologies with collaboration of local and foreign private sectors for development of high technology base.
- Providing financial and technical supports through various research and study projects and in industrial prototypes.
- Establishment of Advanced Industrial Center and adapting venture capital mechanism.
- Establishment of advanced research centers.
- Preparation for employing human resources required for industrial and mineral sector through implementation of various projects.
- “FAJED” (Universities Young Graduates) is considered as one of these projects. Based on this project over 10000 university graduates, (B.S and higher degree) have been employed in last three years industrial and mineral sector. The main purpose of implementation of such project is to strengthen the scientific basis required for industrial and technological development. Conducting local training courses and dispatching human resources for study in selected countries will significantly strengthen the scientific and technological potentials for achieving sustainable development.