**Doing science-based regional development rationally in Pakistan**

**Ali Shah**

**Head of Research, NUST Institute of Policy Studies (NIPS)**

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The government’s recent promotion of initiatives such as science parks, high-tech special economic zones, special technology development zones, and related organizations in different parts of the country is a clear sign of its good intentions to promote science-based regional development in Pakistan. But good intentions need to be backed by good logic to bear good results.

Science-based regional development is the special subset of regional economic development. In simplest terms, it aims to change the economic characteristics and growth trajectory of a designated city or region from low to high development, combined with increases in the level of skills and per capita income of the given city or region, through initiatives aimed at promoting S&T business and industry.

Since people who do science and technology are generally to be found in public and private universities and R&D setups, universities play a leading role in this special form of development. Since the density and proximity of organized groups of people and enterprises is the time-honored route for creativity and inventions to flourish as well as communication, transaction, transportation, and opportunity costs to come down, unique spaces called new industrial clusters like special economic zones, industrial parks, science and technology parks, research parks, business incubators and accelerators, high-tech development zones, etc., are set up within the striking distance of higher education institutions and R&D centers.

Since people who do all these special things need to live well like ordinary human beings, a good living environment, complete with the best of what man has made in housing, health, education, recreation, and entertainment and what nature provides, is built in and around these spaces through mix-used urban land development.

Since all of this cannot be left to the whimsies of chance, government plays the guiding and facilitating role in partnership with multiple stakeholders to promote the development of these bright spots of human creativity and ingenuity, primarily through making attractive rules that influence the free movement of high-value people, goods and services in and out of these spaces.

Global experience of science-based regional development in advanced, newly industrialized, and emerging nations reveals a surprising insight, which is that the way governments promote science-based regional development in any single area, region or city follows the stipulation of Occam’s razor. This philosophical principle holds that the explanation with the fewest necessary assumptions tends to be the correct one, or that things should not be multiplied beyond necessity.

Whether it was the birth of the iconic Silicon Valley in Palo Alto, California, around the nucleus of Stanford Industrial Park, later Stanford Research Park, in 1950s, or the origins of South Korea’s major innovation hub, Daedeok Innopolis, as Daedeok Science Town centered on Daedeok Science Park in 1970s, or the beginning of China’s biggest science park, Zhongguancun Science Park, as Beijing High-Technology Industrial Development Zone in 1988, actual historical experience shows that best results are obtained when in early stages the whole focus of planning is on the maximal development of one high-tech SEZ or science park in a single city or region. This allows for the optimal utilization of scarce resources and affords their proper concentration. Once fully developed, such a high-tech SEZ, science park or technology development zone makes outsize contributions to regional economy and GDP growth, and encourages similar initiatives elsewhere. Silicon Valley could not have become a global success, if there was not one but many research parks in Palo Alto in the beginning.

Somehow, this intensive minimalist approach is not being adopted in Pakistan. The focus in Pakistan is to promote multiple initiatives of essentially the same type in the same city or region. If we take the example of Islamabad, prioritized all-round development of one high-tech special economic zone, such as NUST-based National Science and Technology Park (NSTP), that is already at a moderately advanced stage of development higher than any other similar initiative in the twin cities, will be sufficient to promote S&T-led innovation and upgrade the twin cities’ regional economic structure. It enjoys a good location, a good ecosystem, and a good concentration of S&T talents.

All public and private universities and science, technology and innovation (STI) promotion organizations in Islamabad and Rawalpindi should be incentivized by the government to collaborate for the high-quality, large-scale development of NSTP. Similarly, all tech startups in Islamabad and Rawalpindi should be encouraged to set up shop in NSTP, while existing S&T enterprises and R&D setups should be facilitated to relocate there rather than be dispersed across multiple locations.

Our policymakers need to consider that all of Pakistan’s regions, cities, and initiatives cannot rise at the same time. If we tried this, we would not succeed. Multi-country experience of contemporary national development shows that in order for a country the size of Pakistan to rise as a whole, a few, say 4 or 5, cities have to rise first, and in order for these cities to rise, only one major, preferably already functional, R&D setup, high-tech development zone, SEZ or science park like NSTP in each city needs to rise first. Multiplicity of such initiatives in the same city or region will cause the dilution of limited S&T resources and thus inhibit their agglomeration.

At the same time, the government should consider reform, greater coordination and increased funding for major national STI promotion organizations like MoST, HEC, the Ministry of IT, and 1 or 2 top public universities, along with the establishment of new entities. New setups absorb resources which are already in short supply without producing bang for the buck. There is also a tendency for them to ensure their own survival at the cost of objectives they were given by the government.

This occasionally happens through what is called bikeshedding or Parkinson’s law of triviality – meaning ignoring complex but really important objectives in favour of spending the bulk of time and money doing things that are easy for most to do and understand, such as overhead utilization, organization of and participation in big-ticket conferences, multiple MoUs, frenzied networking untethered to strategic goals, overbooked roster of internal and external meetings, high social media footprint, etc. To be fair, this can happen even in an established organization, but new ones are especially vulnerable as they are under pressure to show greater results in less time.

New entities related to science-based regional development should be given crystal-clear but few targets, and then strictly monitored, while not being allowed to switch their goals ever so gradually and subtly, leading to the loss of real objectives amidst activities that appear to be a movement toward, but are, in fact a digression from their key deliverables. They should also be properly rewarded upon the concrete achievement of practical development targets such as developing STI infrastructure and clustering, measured against objectively verifiable indicators of regional and city-based growth.

One urgent area of attention, in so far as science-based regional development is concerned, is the modernization of Pakistan’s city development authorities and metropolitan corporations to grasp the realities of 21st century urban governance. Since science parks and high-tech development zones are a typically urban phenomenon, city governments and district administrations will need to train themselves to work at the forefront of the development and management of urban STI infrastructure and resources.

Where government differs from nature is that the former provides the benefits of evolution like greater competitiveness, survivability, fitness, and dynamism, while protecting against evolution’s drawbacks like wasteful competition and non-conservation of effort and energy that happens when multiple entities of the same type jostle for existence in the same ecological niche with dwindling resources. We should remember that the nascent national STI sector will burn itself out if it spreads itself thin.