

IMPEDIMENTS IN THE ROLE OF ENGINEERS IN ECONOMIC DEVELOPMENT

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ABSTRACT

The basic contributor to economic development is the flow of money into the community. The flow depends on surplus goods and services, and communication and transportation connections to external markets. It brings about rise in the income level, standard of living and quality of living. Pakistan's economy has natural upward trends and has proved to be resilient against frequent crises it meets. Some of them occur because of inadequate planning machinery, energy shortfall, and foreign exchange imbalance. In spite of these impediments, the sectors, where engineers provide back up, show significant upward trends. An integrated approach is required encompassing all disciplines and the engineers must learn to take up this new role if the impediments are to be addressed properly.

INTRODUCTION

By definition, the economic development is a net gain of money flow, called an "economic base", into the community. The economic base is derived from the production of resources, goods and services in excess of local consumption needs. It focuses on bringing in money from outside the community, not just re-circulating the same money within the community. Both basic communication and transportation infrastructure are essential to economic development. Without contact with the outside world, a community can't tell people about its surplus products. Economic development is also measured by its effect on raising income levels of individuals. Income levels are also raised by education, creativity and entrepreneurship support. Raising of the income levels is just not enough. Raising of standard and quality of living is more important, in the broader perspective.

A new building, no matter how majestic it may look, does not contribute to economic development, as long as it does not bring money from outside into the community. A factory which does not cause surplus goods that can be sold outside the community, does nothing to contribute to the economic development. Extraction of mineral resources, and agricultural produce, however directly add to the economic development, when the produce exceeds the threshold of surplus level. Rise in education level, creativity and entrepreneurship can also go down the drain, if the people who acquire such capabilities leave the community, and send no money home, or the system is otherwise such that it cannot avail their capabilities.

All the policy formulations from the governments, whether district, provincial or federal, need to observe this basic mechanism, if they are serious. Whenever there is any policy formulation from the governments, we need to check, if it is exothermic or endothermic; exothermic being the one which brings about economic development and endothermic being the one which inhales economic development.

The indicators that demonstrate whether the result of any intervention is going to bring about economic development or is going to diminish the economic development, in a simplified form are:

- a. Building of communications, transportation infrastructure;
- b. Production of surplus goods and services;
- c. Flow of money into the community;

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- d. Rise in the income level of the individuals as a whole (not just a few); and
- e. Rise in the standard of and quality of living of individuals as a whole (not just a few).

It may be noted that the items (a) to (d) above are intermediary items. They ultimately contribute into (e), which is the net resultant indicator, or the total denominator.

It is easy to say that the building of communication systems, transportation infrastructure, and production of goods and services, are those areas where engineers are actively involved. But it difficult to isolate them from others such as civil service officials, planning officials, financial people, administrators, legislators, political leaders, law professionals, social workers, civil society, health people, academicians, manufactures, traders and transporters. As regards the flow of money into the community, rise in the income level and rise in the standard and quality of living, it seems that the engineers do not have a remotest control over them. If we want, that what engineers do should go a direct way right into the depth of these factors, major changes in the position of engineers within the power and control hierarchy in the social structure will be needed to make. We need to study those societies, where a greater role has been given to engineers and that have produced significant effect.

In order to evaluate the role of engineers in economic development, we first need to know where and what does the bulk of our engineers work, what proportions are they in the population to be effective, how are they trained so that they can meet the needs, and who makes decisions for their utilization. We will then proceed on to link their work to the above listed indicators that determine the impact on economic development. We need to have a look if, in the last years that are passed, there was an economic development in real sense of the word. Have there been fluctuations, and if so, for what reasons. Have engineers, or their performances have been the cause. Have there been causes other than attributed to the engineers. Lastly, what are the trends, for the years to come. What can we do to improve.

Similarly, we need to look at the past, regarding the policy formulations. In the last years, what policies have been formulated that have influenced economic development. Who are the people who formulated these policies. Were the engineers taken into confidence in making such policy formulations. In the years to come, should the engineers be consulted, or should they be entrusted to make the policy formulations themselves. While discussing all this, we need to compare the same with other countries, especially with those countries, who are in similar situation as we are.

These are all questions and questions. There are a lot more, which go beyond the capacity of this paper. Yet they may be needed for further and advanced level of study.

For the present Paper, we will touch a few major aspects, to demonstrate what issues are involved, and what techniques are available to us to address them.

PROPORTION OF ENGINEERS

Pakistan has about 60,000 registered engineers in a population of about 180m as on the turn of 2013. This makes 0.33 in 1000.

As per US Census Bureau of 2010 there are 2,495,000 engineers in the USA in a population of 317m. This makes 7.87 in 1000.

India has only 0.214 engineers per 1000, China 0.340, Japan 0.765 and South Korea 1.435.

The percentage of doctorate degrees compared to engineering degrees was much higher in most of the other countries — 9 per cent in the US, 10 per cent UK, 8 per cent Germany and 3 per cent South Korea.

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Over and above this, the rate of increase of number of engineers is alarming. India has an impressive 10.4 per cent increase in the number of graduate engineers, while China recorded a 9.9 per cent increase in the number of graduate engineers, South Korea's progress is 5.9 per cent. The UK trails far behind with 3.9 per cent and the US with a negative growth of -1.0 per cent.

Another comparison is startling. Out of the graduates, who pass out, only 10% go into entrepreneurship while 90% go into employment. In Germany, 40% go into entrepreneurship and 60% into employment. In Japan 80% go into entrepreneurship and only 20% go into employment.

ECONOMY OF PAKISTAN

The economy of Pakistan is the 27th largest in the world in terms of purchasing power parity (PPP), and 44th largest in terms of nominal GDP. However as Pakistan has a population of over 183 million (the world's 6th-largest), GDP per capita is low: the nation's 2012 PPP-adjusted GDP per capita of approximately US \$ 2900 ranked 135th, 141st, or 147th in the world according to the International Monetary Fund, World Bank, and US Central Intelligence Agency respectively.

Pakistan has a semi-industrialised economy,^{[1][2][3]} which mainly encompasses textiles, chemicals, food processing, agriculture and other industries. Growth poles of Pakistan's economy are situated along the Indus River;^{[3][4]} diversified economies of Karachi and Punjab's urban centres coexist with lesser developed areas in other parts of the country.^[3] The economy has suffered in the past from decades of internal political disputes, a fast growing population, mixed levels of foreign investment and high defence spending.^[5] Foreign exchange reserves are bolstered by steady worker remittances, but a growing current account deficit – driven by a widening trade gap as import growth outstrips export expansion – could draw down reserves and dampen GDP growth in the medium term.^[6]

Natural Upward Trend of the Gross Domestic Product

This is a chart of trend of gross domestic product of Pakistan at market prices estimated ^[8] by the International Monetary Fund with figures in millions of Pakistani Rupees. See also^[7]

Year	Gross Domestic Product	US Dollar Exchange	Inflation Index (2000=100)	Per Capita Income (as % of USA)
1960	20,058	4.76 Pakistani Rupees		3.37
1965	31,740	4.76 Pakistani Rupees		3.40
1970	51,355	4.76 Pakistani Rupees		3.26
1975	131,330	9.91 Pakistani Rupees		2.36
1978	283,460	9.97 Pakistani Rupees	21	2.83
1985	569,114	16.28 Pakistani Rupees	30	2.07
1990	1,029,093	21.41 Pakistani Rupees	41	1.92
1995	2,268,461	30.62 Pakistani Rupees	68	2.16
2000	3,826,111	51.64 Pakistani Rupees	100	1.54
2005	6,581,103	59.86 Pakistani Rupees	126	1.71

Economic resilience inspite of Crises

Pakistan's economy proved to be unexpectedly resilient in the face of multiple adverse events concentrated into a four-year (1998–2002) period —
the Asian financial crisis;

economic sanctions – according to Colin Powell, Pakistan was "sanctioned to the eyeballs";^[9]

The global recession of 2001–2002;

a severe drought – the worst in Pakistan's history, lasting about four years;

heightened perceptions of risk as a result of military tensions with India – with as many as 1 million troops on the border, and predictions of impending (potentially nuclear) war;

the post-9 / 11 military action in neighbouring Afghanistan, with a massive influx of refugees from that country;

Despite these adverse events, Pakistan's economy kept growing, and economic growth accelerated towards the end of this period. This resilience has led to a change in perceptions of the economy, with leading international institutions such as the IMF, World Bank, and the ADB praising Pakistan's performance in the face of adversity.

Since the beginning of 2008, Pakistan's economic outlook has stagnated. Security concerns stemming from the nation's role in the War on Terror have created great instability and led to a decline in Foreign Direct Investment from a height of approximately \$ 8 bn to \$ 3.5 bn for the current fiscal year. Concurrently, the insurgency has forced massive capital flight from Pakistan to the Gulf. Combined with high global commodity prices, the dual impact has shocked Pakistan's economy, with gaping trade deficits, high inflation and a crash in the value of the Rupee, which has fallen from 60–1 USD to over 80-1 USD in a few months. For the first time in years, it may have to seek external funding as Balance of Payments support. Consequently, S&P lowered Pakistan's foreign currency debt rating to CCC-plus from B, just several notches above a level that would indicate default. Pakistan's local currency debt rating was lowered to B-minus from BB-minus. Credit agency Moody's Investors Service cut its outlook on Pakistan's debt to negative from stable due to political uncertainty, though it maintained the country's rating at B2. The cost of protection against a default in Pakistan's sovereign debt trades at 1,800 basis points, according to its five-year credit default swap, a level that indicates investors believe the country is already in or will soon be in default.

The middle term however may be less turbulent, depending on the political environment. The EIU estimates that inflation should drop back to single digits in 2010, and that growth should pick up to over 5% per annum by 2011. Although less than the previous 5 year average of 7%, it would represent an overcoming of the present crisis wherein growth is a mere 3.5-4%.^[10]

Economic comparison of Pakistan 1999–2008

Indicator	1999	2007	2008	2009
GDP	\$ 75 billion	\$ 160 billion	\$ 170 billion	\$ 185 billion
GDP Purchasing Power Parity (PPP)	\$ 270 billion	\$ 475.5 billion	\$ 504 billion	\$ 545.6 billion
GDP per Capita Income	\$ 450	\$ 925	\$1085	\$1250
Revenue collection	Rs. 305 billion	Rs. 708 billion	Rs. 990 billion	Rs. 1.05 trillion
Foreign reserves	\$ 1.96 billion	\$ 16.4 billion	\$ 8.89 billion	\$ 17.21 billion
Exports	\$ 8.5 billion	\$ 18.5 billion	\$ 19.22 billion	\$ 18.45 billion
Textile Exports	\$ 5.5 billion	\$ 11.2 billion	–	–
KHI stock exchange (100-Index)	\$ 5 billion at 700 points	\$ 75 billion at 14,000 points	\$ 46 billion at 9,300 points	\$ 26.5 billion at 9,000 points
Foreign Direct Investment	\$ 1 billion	\$ 8.4 billion	\$ 5.19 billion	\$ 4.6 billion
External Debt & Liabilities	\$ 39 billion	\$ 40.17 billion	\$ 45.9 billion	\$ 50.1 billion
Poverty level	34%	24%	–	–
Literacy rate	45%	53%	–	–
Development programmes	Rs. 80 billion	Rs. 520 billion	Rs. 549.7 billion	Rs. 621 billion

UPWARD TREND IN SECTORS BACKED UP BY ENGINEERS

Manufacturing sector, industrial sectors, SME's, textile sector, mining, services communication and transportation are major sectors where engineers provide the backbone.

In spite of all odds, these are the sectors where there is a natural upward trend.

Manufacturing Sector

Pakistan's manufacturing sector has experienced double-digit growth in recent years, from 2000 to 2007, with large-scale manufacturing growing from a minimal 1.5% in 1999 to a record 19.9% in 2004–2005 and averaged 8.8% by end of 2007.

The Federal Bureau of Statistics valued the finance and insurance sector at Rs. 311,741 million in 2005 thus registering over 166% growth since 2000. A reduction in the fiscal deficit had resulted in less government borrowing in the domestic money market, lower interest rates, and an expansion in private sector lending to businesses and consumers.

Industrial Sector

Pakistan's industrial sector accounts for about 24% of GDP. Cotton textile production and apparel manufacturing are Pakistan's largest industries, accounting for about 66% of the merchandise exports and almost 40% of the employed labour force.^[18] Other major industries include cement, fertiliser, edible oil, sugar, steel, tobacco, chemicals, machinery, and food processing.

The government is privatising large-scale parastatal units, and the public sector accounts for a shrinking proportion of industrial output, while growth in overall industrial output (including the private sector) has accelerated. Government policies aim to diversify the country's industrial base and bolster export industries.

Industries: textiles (8.5% of the GDP), fertiliser, cement, oil refineries, dairy products, food processing, beverages, construction materials, clothing, paper products, shrimp

Industrial production growth rate: 6% (2005)

Large-scale manufacturing growth rate: 19.9% (2005)

SME Sector

In Pakistan SME's have a significant contribution in the total GDP of Pakistan, according to SMEDA and Economic survey reports, the share in the annual GDP is 40% likewise SME's generating significant employment opportunities for skilled workers and entrepreneurs. Small and medium scale firms represent nearly 90% of all the enterprises in Pakistan and employ 80% of the non-agricultural labour force. These figures indicate the potential and further growth in this sector.^[19]

Textiles

The Textile Industry is dominated by Punjab. 3% of United States imports regarding clothing and other form of textiles is covered by Pakistan.^[20] Textile exports in 1999 were \$ 5.2 billion and rose to become \$10.5 billion by 2007. Textile exports managed to increase at a very decent growth of 16% in 2006. In the period July 2007 – June 2008, textile exports were US\$10.62 billion. Textile exports share in total export of Pakistan has declined from 67% in 1997 to 55% in 2008, as exports of other textile sectors grew. The major reason of decline of textile export of Pakistan is the Govt unhealthy policies. Sui Northern Gas Pipelines Ltd. (SNGPL) notified the textile mills to reduce the supply of gas for five months. Head of All Pakistan Textile Mills Association of Enterprises Anis-ul-Haq has expressed concern about the decision : “Now is the time to the textile industry out of a three-year downturn. The demand for textile products is growing, and if we are not able to fulfill our current orders, we will lose international buyers“. Monthly loss of the textile industry because of interruptions in gas supply could reach about U.S. \$ 1 billion, or 4 – \$ 5 billion for the fiscal year ending June 20 next year.

Mining

Pakistan is endowed with significant mineral resources and is emerging as a very promising area for prospecting / exploration for mineral deposits. Based on available information, the country's more than 6,00,000 km² of outcrops area demonstrates varied geological potential for metallic and non-metallic mineral deposits. Except oil, gas and nuclear minerals regulated at federal level, minerals are a provincial subject, under the constitution of the Islamic Republic of Pakistan. Provincial governments are responsible for development and exploitation of minerals, besides, enforcing regulatory regime. In line with the constitutional framework the federal and provincial governments have jointly set out Pakistan's first National Mineral Policy in 1995, duly implemented by the provinces, providing appropriate institutional and regulatory framework and equitable and internationally competitive fiscal regime.

In the recent past, exploration by government agencies as well as by multinational mining companies presents ample evidence of the occurrences of sizeable mineral deposits. Recent discoveries of a thick oxidised zone underlain by sulphide zones in the shield area of the Punjab province, covered by thick alluvial cover have opened new vistas for metallic minerals exploration. Pakistan has a large base for industrial minerals. The discovery of coal deposits having over 175 billion tons of reserves at Thar in the Sindh province has given an impetus to develop it as an alternate source of energy. There is vast potential for precious and dimension stones.

Currently about 52 minerals are under exploitation although on small scale. The major production is of coal, rock salt and other industrial and construction minerals. The current contribution of the mineral sector to the GDP is about 0.5% and likely to increase considerably on the development and commercial exploitation of Saindak & Reco Diq copper and gold deposits (world's largest gold mine), Duddar zinc lead, Thar coal and gemstone deposits.

Services

Pakistan's service sector accounts for about 53.3% of GDP.^[21] Transport, storage, communications, finance, and insurance account for 24% of this sector, and wholesale and retail trade about 30%. Pakistan is trying to promote the information industry and other modern service industries through incentives such as long-term tax holidays.

The government is acutely conscious of the immense job growth opportunities in service sector and has launched aggressive privatisation of telecommunications, utilities and banking despite union unrest.^[citation needed]

Communication

After the deregulation of the telecommunication industry, the sector has seen an exponential growth. Pakistan Telecommunication Company Ltd has emerged as a successful Forbes 2000 conglomerate with over US \$ 1 billion in sales in 2005. The mobile telephone market has exploded fourteen-fold since 2000 to reach a subscriber base of 91 million users in 2008, one of the highest mobile teledensities in the entire world.^[21] In addition, there are over 6 million landlines in the country with 100% fibre-optic network and coverage via WLL in even the remotest areas.^[22] As a result, Pakistan won the prestigious Government Leadership award of GSM Association in 2006.^[23]

Rise of Middle Class

As of 2013, according to Macro Economic Insights, a research firm in Islamabad, the size of the Pakistani middle class is conservatively estimated at approximately 70 million, out of a total population of 190 million. This represents 40% of the population of the country.^[11]

On measures of income inequality, the country ranks slightly better than the median. In late 2006, the Central Board of Revenue estimated that there were almost 2.8 million income-tax payers in the country.^[12] However by 2013, the number of taxpayers was drastically reduced to just 768,000 out of a total population of 190 million, meaning that only 0.57% of the population pay taxes^[13]

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Poverty levels have decreased by 10% since 2001^[14] Foreign Companies which provide for Pakistani middle classes have been very successful. For example, demand for Unilever products have recently been so high that even after doubling production the Anglo-Dutch company struggled to meet demand and its chairman stated "Pakistanis can't seem to have enough".^[15]

With a per capita GDP of \$2600 (PPP, 2005) in 2005 the World Bank considers Pakistan a low-income country, it is also recorded as a "Low Development Country" on the Human Development Index 2007. Pakistan has a large informal economy, which the government is trying to document and assess. Approximately 56% of adults are literate, and life expectancy is about 64 years. The population, about 168 million in 2007, is growing at about 1.80%.

Relatively few resources in the past had been devoted to socio-economic development or infrastructure projects. Inadequate provision of social services, high birth rates and immigration from nearby countries in the past have contributed to a persistence of poverty. An influential recent study^[16] concluded that the fertility rate peaked in the 1980s, and has since fallen sharply. Pakistan has a family-income Gini index of 41, close to the world average of 39.

SHORTFALL OF ENERGY - A KILLER FACTOR

For years, the matter of balancing Pakistan's supply against the demand for electricity has remained a largely unresolved matter. Pakistan faces a significant challenge in revamping its network responsible for the supply of electricity. While the government claims credit for overseeing a turnaround in the economy through a comprehensive recovery, it has just failed to oversee a similar improvement in the quality of the network for electricity supply. Most cities in Pakistan receive substantial sunlight throughout the year, which would suggest good conditions for investment in solar energy. If the rich people in Pakistan are shifted to solar energy that they should be forced to purchase solar panels, the shortfall can be controlled. This will make the economy boost again as before 2007.

FOREIGN EXCHANGE RATE - A KILLER FACTOR

The Pakistani Rupee was pegged to the Pound sterling until 1982, when the government of General Zia-ul-Haq, changed it to managed float. As a result, the rupee devalued by 38.5% between 1982/83 many of the industries built by his predecessor suffered with a huge surge in import costs. After years of appreciation under Zulfikar Ali Bhutto and despite huge increases in foreign aid the Rupee depreciated.

The Pakistani rupee depreciated against the US dollar until around the start of the 21st century, when Pakistan's large current-account surplus pushed the value of the rupee up versus the dollar. Pakistan's central bank then stabilised by lowering interest rates and buying dollars, in order to preserve the country's export competitiveness.

PKR per US dollar 1995–2008				
Year	Highest		Lowest	
	Date	Rate	Date	Rate
1996		PKR 30.930		
1997				PKR 35.266
1998		PKR 40.185		
1999		PKR 44.550		
2000		PKR 51.90		
2001		PKR 53.6482		
2002		PKR 61.9272		
2003		PKR 59.7238		

2005		PKR 57.752		
2006		PKR 58.000		
2009	05 Aug	PKR 60.75	01 Nov	PKR 60.50
2010	October 10	PKR 80.00	01 Apr	PKR 63.50
Source: PKR exchange rates in USD, SBP				

INADEQUACIES OF PLANNING ANOTHER KILLER FACTOR

Following are main hindrances in the way of effective planning in Pakistan:

(a) Administrative obstacles of planning: One major obstacle which has stood in the way of establishing a sound, efficient and independent planning authority is the lack of an effective administrative machinery as this has greatly limited the tasks of development policy and planning. Some of the factors which still continue to be major hindrances and act as administrative obstacles and bottlenecks to planning are discussed below:

(i) Lack of competent personnel: One of the major obstacles in the way of an effective planning machinery is the lack of competent personnel. Good and highly qualified economists, technicians, planners, etc. do not join government service because of lack of salaries and facilities.

(ii) Dilatory procedures: In Pakistan, documents and files must follow a prescribed series of steps through administrative layers. It has been pointed out that often there seems to be a disposition to shift the file and documents from one office to another, or from one ministry to another. The resultant delays are sometimes unbelievably long.

(iii) Lack of coordination: In many cases, the coordination of development activities has been extremely difficult because responsibility for different aspects of a project or programme are divided among many ministries and agencies. So it becomes, sometimes, very difficult to carry on programme according to policy.

(b) Inadequate preparatory work on projects: When a potentially desirable project has to be identified, a feasibility study has to be made to determine whether it is practicable and justified. A feasibility study involves a detailed examination of the economic, technical, financial, commercial and organisational aspects of a project.

According to Planning Commission of Pakistan, preparatory work on public projects in the country was frequently lacking. So due to inadequate preparatory work on projects, our plans have been failed in achieving their targets.

(c) Lack of implementation of plans: A major reason for the lack of implementation of the country's various five year plans has been the widespread failure of the governments of the day to maintain discipline, implicit in their plan. What is planned and what is done in many cases bears little relationship to each other. At times it almost appears that plans are prepared by a planning agency in one corner of a government and policy is made by various bodies in other corners.

(d) Lack of evaluation of plan progress and project implementation: Flexibility is an essential element of development planning because in many cases changes in economic conditions make deviations from original plan unavoidable. A central planning agency must, therefore, constantly review and assess progress in relation to events.

Unfortunately, whenever evaluation has been prepared by the country's planning authorities, they have been issued long after the end of the period to which they refer. In many cases the mid-term reviews of five year plans have been published almost near the end of the plan period and the final reviews of the

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plan have come long after the new plan have been launched and, therefore, been of little use to formulating targets and policies for the new plan. The need for a good reporting system on plan and project implementation is, therefore, an essential prerequisite for a good evaluation system.

An Operational Approach to Plan/Project Appraisal

A development plan is essentially a forward looking policy framework which envisages a concrete and prioritised but somewhat flexible programme of action to be launched in a dynamic situation to attain specified economic and social objectives. A plan or a programme / project is ultimately as good as its implementation since it is the actual achievement of the results in line with the targets and not merely the targets set or the resources allocated that determine the degree of success or failure of the plan / programme as well as its impact on the socio-economic life of the people. Thus, it is clear that only the technically, financially and economically sound and viable projects, if properly executed in a coordinated manner, can provide a strong edifice for the successful implementation of the plan.

Most of the developing countries still need to further evolve their development planning processes by redefining their national objectives and searching for alternative strategies, programmes and projects because it has been realised by most of them by now that the development planning adopted so far could not achieve the desired results especially in the areas of social development and income distribution. Recent international experience also shows conclusively that the formulation of technically sound, economically viable and administratively feasible programmes / projects, their proper appraisal, implementation and management are amongst the palpably weaker areas of development planning. In numerous instances, projects included in the development plans have either not been optimally implemented or even if implemented, have failed to yield the expected results on time. Similarly, such other factors like deliberate under-estimating of costs and over-pitching of targets at the approval stage, coupled with recent increase in input prices, have adversely affected the overall plan implementation in most of the LDCs.

In recent years, increasing attention is being devoted to more systematic processes of planning and decision making as a means of addressing the concerns of developing countries about the pace and pattern of economic growth, the failure to achieve planned objectives, and the continuing financial and economic crises. This approach has reinforced the case for greater depth in and a more systematic and inter-related approach to the monitoring, evaluation and follow-up of all public policy actions. This renewed urge is shared both by national as well as international agencies in order to up-grade the developing countries' status.

The United Nations International Development Strategy (UNIDS), therefore, emphasizes that, to provide increasing opportunities to all people for a better life, it is essential in the development planning to bring about more equitable distribution of income and wealth for promoting both social justice and efficiency of production, to raise substantially the level of employment, to achieve a greater degree of income security, to expand and improve facilities for education, health, nutrition, housing and social welfare, and to safeguard the environment. The International Development Strategy emphasizes the importance of national evaluation system. According to UNAIDS, every developing country is needed to establish a reliable and independent evaluation machinery or strengthening the existing one, in order to ensure the implementation of development programmes.

Plan Preparation and Implementation Cycle:

The process of development appraisal and performance evaluation is an intrinsic component of planning. The standard plan preparation and plan implementation cycle includes:

- (a) Establishment of goals, objectives and targets;
- (b) Formulation of strategies;
- (c) Formulation of operating plans composed of policies and specific measures necessary to achieve the real targets;

- (d) Implementation of policies and measures to the plan;
- (e) Monitoring and evaluation of performance (both financial and physical) against targets;
- (f) Adjustment of targets and/or plans as may be indicated by actual accomplishments and related developments.

ENGINEERS' NEW ROLE

Engineering have played a critical role in increasing the health, technology and quality of life in the last 50 years, From developing new equipments and goods, power systems, weapons, new materials, vehicles which will transport people and goods on ground, water and air, better water supplies, design of buildings to protect us from natural hazards and provide health care, improved agriculture, transportation systems, basic infrastructure on which modern society depends, power plants which give electrical power to do daily work and run industry. Engineers work has helped to comfort and do daily routines easier, reduced the death rate dramatically which is one of the principal reasons that population has been able to grow so dramatically in the last 150 years.

It has been pointed out, that the improvements in transportation alone have enabled rapid migration of large numbers of people all over the world and increased the volume of raw materials and finished products in international trade 800 times in the last century. Economic output has increased over 20 times, fossil fuel 30 times and industrial production 100 times in the last century.

Real time economic development can only be said to have occurred with the creation of a worldwide caring community; a community of people who are working together for common ends and to meet the basic needs of all our people.

This concept of real time economic development is central to the achievement of these key goals. It can be thought of in terms of policies and programmes designed to meet the needs of present generations without compromising the ability of future generations to meet their own needs. The achievement of real time economic development requires a new and different approach to policy making and its implementation. The Government is looking for greater integration and co-ordination of policy making and its implementation across the public sector, and across social, economic and environmental policy portfolios. It is also looking for an approach characterized by greater partnership between central government, local government, Maori economic entities, private industry and other community groups.

We need all professionals to carry out their lives and activities in a manner that is environmentally sound and sustainable. In addition, the current education and training of most professionals who are and will be employed by government, industry, academia and environmental organizations is narrowly focused and incomplete. Most of these professionals are trained in dealing with a subset of problems, but are not trained to deal with issues in an integrated and comprehensive fashion. Designing a sustainable future requires a paradigm shift toward a systemic perspective which encompasses the complex interdependence of individual, social, cultural, economic and political activities and the biosphere.

The engineers of the future must be much more interdisciplinary – the lines between the traditional engineering disciplines must be much more fluid or removed completely. Engineers will have to join forces with biologists, chemists, meteorologists, economists, planners, political scientists, ethicists and community leaders in unprecedented ways to lead society on a sustainable path. Since it is likely that we will double the amount of housing and building construction in the twenty-first century (and buildings utilize a tremendous amount of materials and energy) it is imperative that civil engineers team up with architects, planners and other engineers to revolutionize construction. I believe that there is a special role for civil / environmental engineers in the future. Rather than being the engineers that primarily design technologies, the engineers should be the interdisciplinary, systems specialists who will bring together, coordinate and manage all the specialists to solve complex problems. Moreover, all engineers

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must play a much stronger role in the public policy process to provide the right incentives for industry and others to move on a sustainable path so that engineers can be encouraged and supported to design the right technological systems. We must become better informed of the interdependence of environmental, economic, health and social issues, inform others and become leaders.

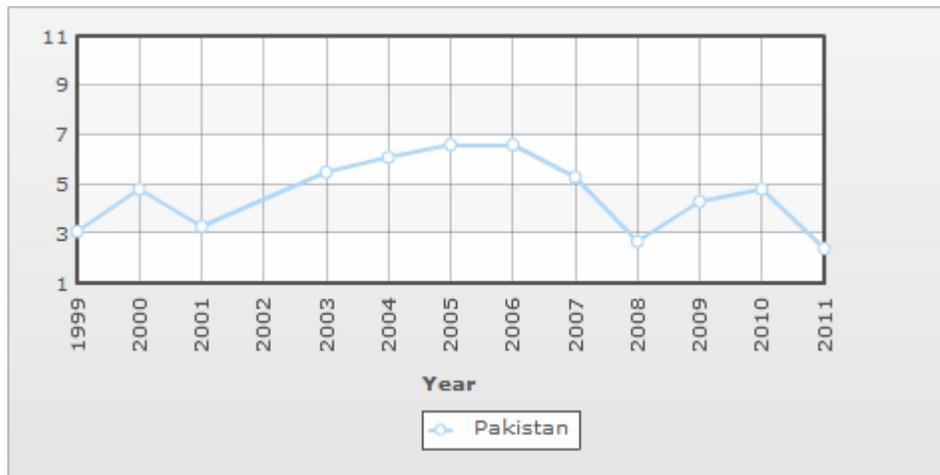
CONCLUSION

Economic development relies on engineers who bring about technological change to achieve its aims. The governments need to take tough steps to remove the impediments that are in their way. Let the radical technological innovations take the lead, rather than the technological fixes that have been evident to date? Such measures would require a long-term view and a preparedness to bear short-term economic costs while industry readjusts.

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Country	1999	2000	2001	2003	2004	2005	2006	2007	2008	2009	2010	2011
Pakistan	3.1	4.8	3.3	5.5	6.1	6.6	6.6	5.3	2.7	4.3	4.8	2.4

Figure-1: GDP - Real Growth Rate (%)

(Definition of GDP - real growth rate: This entry gives GDP growth on an annual basis adjusted for inflation and expressed as a percent).



Figure-2: Pak Rupee to US Dollar Exchange Rate

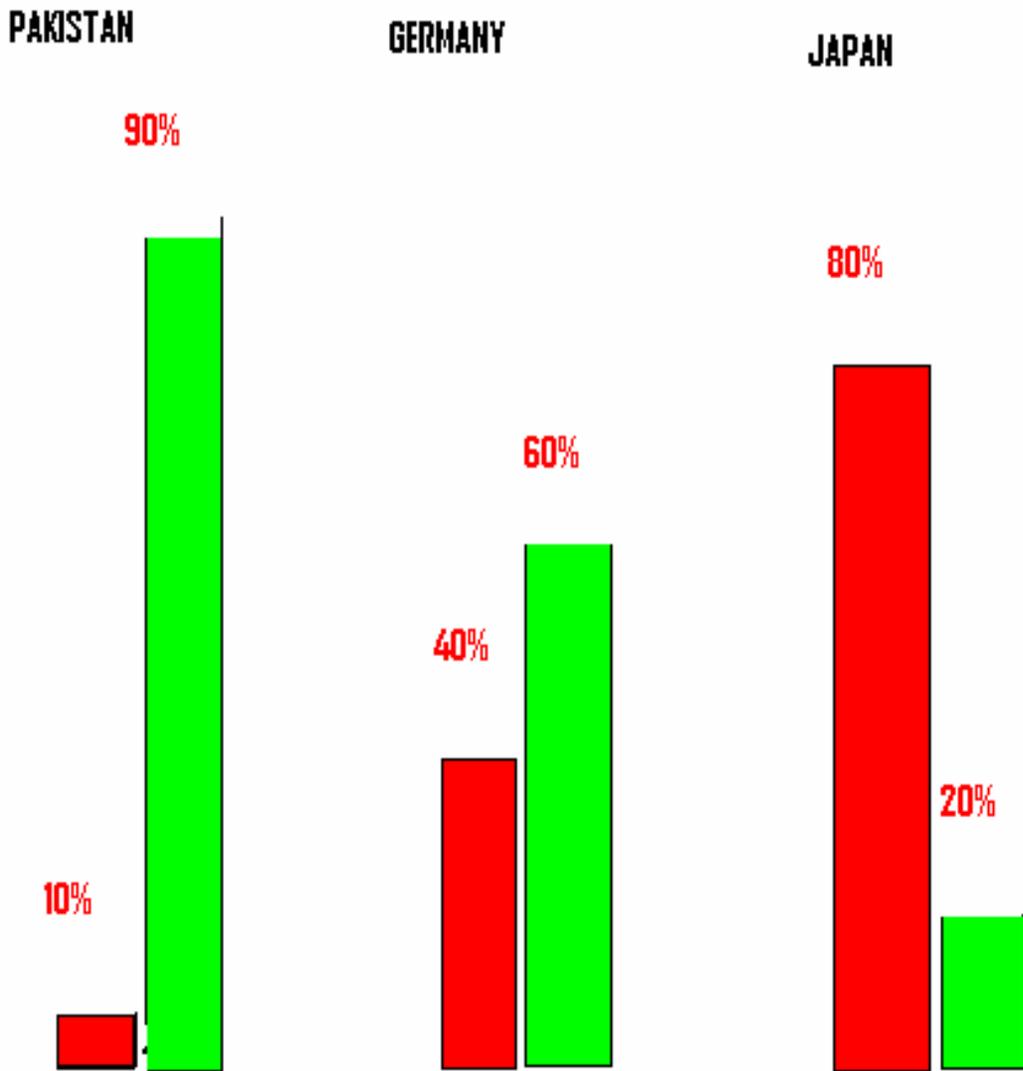


Figure-3: Graduates Taking Entrepreneurship