

ROLE OF HIGHER EDUCATION  
IN INDUSTRIAL DEVELOPMENT  
OF THE REPUBLIC OF KOREA SINCE 1962

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**Master of Philosophy**

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**CERTIFICATE**

This is to certify that the dissertation entitled "ROLE OF HIGHER EDUCATION IN INDUSTRIAL DEVELOPMENT OF THE REPUBLIC OF KOREA SINCE 1962" submitted by Kamal Kishore Panda in partial fulfillment of the requirements of the Degree of MASTER OF PHILOSOPHY (M. Phil) of the University, is an original work and has not been submitted for the award of any other degree of this University or any other University to the best of my knowledge.

We recommend that this dissertation be placed before the examiners for evaluation.

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**IN LOVING MEMORY OF  
MY *FATHER*...**

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## **CHAPTER-1**

DEVELOPMENT OF EDUCATION IN KOREA FROM THE  
ESTABLISHMENT OF YI-DYNASTY TO THE END OF SECOND REPUBLIC  
( 1392-1961)

Koreans have historically recognized the importance and role of education as 'a means of rising in the world.' This was particularly noteworthy during the Yi-Dynasty (1392-1910) which witnessed the hegemony of Confucianism, more particularly neo-Confucianism<sup>1</sup>. It was during the yi-period that the dominant Yangban elite, "maintained itself by legal and de facto inherited status, privileges, landholding, office holding (in the central bureaucracy), and utilization of Confucian orthodoxy for the legitimization of status and economic interests".<sup>2</sup> Since only the sons of Yangban could appear in the higher civil service examination based on Confucianism, a powerful 'Confucious-centric' education system began to assume great importance.

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<sup>1</sup> For details see Lee Jay Cho. " Ethical and social influences of Confucianism", in Lee Jay Cho and Yoon Hyung Kim (eds), *Economic Development in the Republic of Korea : A Policy Perspective*, (Hawaii, East-West Centre, 1991). pp. 553-565  
Also see, Martina Deuchler, *The Confucian Transformation of Korea*. (Harvard University Press, 1992). PP.129-135.

<sup>2</sup> James B. Palais, *Politics and policy in Traditional Korea*. ( Cambridge, Mass : . London Harvard University Press, 1975). pp. 4-5.

In the later part of the 15th century i.e. in 1474, a law code was enacted regarding the school system. According to it, the system of official schools consisted of the district schools (hyanggyo) in the provinces; the Four Schools (Sahak) in the capital which handled secondary education; and, the National Academy (Songgyun'gwan) in the capital for tertiary education.<sup>3</sup> Primary education was left to the private initiatives. At the age of 14 and 15 a student could enter the district school or one of the four schools in the capital which had a capacity of hundred student in each school. The National Academy of Seoul had a quota of two-hundred students between the age 20 and 23 years and these students took the 'munkwa', the highest civil service examination. These government schools had performed a significant educational and social function in the early decades of the Yi-period.

However, the official schools began to decline within a few years of its existence due to the deteriorating quality of both teachers and students. This ultimately contributed to the power of the local educated elite and created a vacuum that was soon to be filled in the sixteenth century when the wave of orthodox neo-Confucianism overcame the literati.

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<sup>3</sup> Ibid. p. 112



In the later half of the Yi-dynasty, there occurred a number of factional controversies which resulted in dividing the Yangbans into various factions. The Korean version of neo-Confucianism was sought to be modified with emphasis on practical studies.<sup>4</sup> The state system of education was to be supplemented by private academies i.e. 'Sowons', which were sponsored by competing factions of Yangban. These schools were meant to supply educated men for competing in the civil service examinations.

After the seventeenth century, there were some important changes in the private academies and the attitudes of government towards them. The private academies had a quantitative expansion in its numbers. Eighty-eight academies were founded between 1542 and 1600. There were more than 600 academies by the beginning of the eighteenth century and by nineteenth century the number rose to 680 (founded since 1542).<sup>5</sup> With the growth in numbers, there was also a change in the nature and function of these academies. In the sixteenth-century these were the centres of learning and contemplation and havens for scholars trying to get rid of the political

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<sup>4</sup> The Korean Version of neo-Confucianism, which emphasized the revival of original Confucian values, was codified principally by Yi. Toegye (also known as Yi-Huang) and Yi-Yulgok. Toegye called for reforms in government and for improved technology. He also wanted to expand the private school network and was an advocate of higher education for the people of Korea. Lee Jay Cho; n-1, p-557,

<sup>5</sup> James B. Palais. n-2, p.114.

unrestlessness. But by the nineteenth century this had been sullied by the growing political and economic functions of the academies. As the academies grew in numbers, they became corporate institutions with political and economic power. They competed with the central government for control over land and population which posed a direct threat to the monarchical authority. And as from 1864-1873, the monarchical power reached its greatest extent under the leadership of Taewongun, who was under pressure from the threat of foreign invasion and rebellion; these academies were eliminated as meaningful institutions.

After the conclusion of the Treaty of Kanghwa, February 1876, Japanese influences began to increase.<sup>6</sup> Japan was then on the road to 'modernization'. One of the most important aspect of the Meiji modernization was the restructuring of the education system

Inspired by the trends of development in their neighborhood, the weak Yi-dynasty started sending tribute missions annually to Japan as well as China.<sup>7</sup> As a first step toward the reform of state administration, it dispatched

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<sup>6</sup> Ki-baik Lee, *A New History of Korea*, (translated by Edward W. Wagner with Edward J. Shultz), (Harvard University Press, Cambridge, Massachusetts, 1984), pp. 298-299; Also See, Harold K. Sunoo, *Korea, A Political History of Modern Times*, (Seoul, Kun Kun University Press), pp. 71-91.

<sup>7</sup> Chong Sik Lee, *The Politics of Korean Nationalism*, (Berkeley), 1963, pp. 13.

a team of young gentlemen to Japan in 1881 for inspection of Japan's administrative, educational, industrial, technological and military institutions. In the team Kim-ok-Kiun was the leader, who was a revolutionary among the progressive Koreans. After returning from Japan, he organized a newspaper which was named "independence" and was published under its banner. Through the newspaper, they propagated for the importation of the ideas and influences of the Western countries.

The party welcomed the Christian Missionary works which they believed would turn Korea toward the progress of the Western world and the culture of new Japan. As a result Christian missionaries and schools were established in different parts, which spreaded literacy among the people and ideas and techniques. They also introduced education for common mass, education for women etc. The major contributions of missionary institutions included the popularization of the Korean script 'hangul' and the introduction of several new subjects i.e. geography, history, arithmetic, science and ideals of Western ideas.<sup>8</sup> In 1885, the state for the first time established a school based on modern education system. Though the age old civil service

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<sup>8</sup> Byung Nak song, *The Rise of the Korean Economy*, (Oxford University Press, 1994), pp. 48-49. Also See Lee Jay Cho and Kenon Brezeale, "The Educational System", n-4, p. 571.

examination was abolished in 1894 due to the pressure of Japan, the urge for education was already well-developed in the Korean minds.

Japan used the pretext of the presence of Chinese soldiers in Korea at the behest of the Korean king to suppress the Tonghak uprising and to increase its military presence in Korea. Following Russia's defeat in the war with Japan in 1905, Japan declared Korea as a protectorate. Five years later in 1910, Japan formally annexed Korea and brought it under its colonial rule.<sup>9</sup>

Soon it began to involve itself in the educational affairs of the Peninsula to crush the dynamism of the movement of "education for the nation", among the Koreans. Till the time there were above 3,000 private schools in Korea managed either by Korean missionaries or Western missionaries teaching Western science, Law, Arithmetic all in Korean script, and preaching patriotic sentiments against the Japanese. But when the education regulation came out in 1906, all these academies needed the approval of Japanese government. All the government-run schools were taken over by the Japanese. The primary schools were reduced to ordinary schools

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<sup>9</sup>For details see, Henderson, Gregory, *Korea the Politics of the Vortex*, (Cambridge, Mass : Harvard University Press, 1968), pp. 59-112  
Also See John. Woronoff, *Asia's Miracle Economies*, Si-Sa-Yong-Osa Inc, 1986, pp. 91-92.

furthermore reducing the duration to four years from six years and in case of secondary schools, to three years from seven years by 1909.<sup>10</sup>

Japan was keen to use the instruments of education not so much to liberate the minds but to enforce loyalty among the colonial subjects. This becomes abundantly clear from the first two articles of educational ordinance in Korea, enacted and promulgated in 1911;

1. The essential principle of education in Korea shall be the making of loyal and good subjects by giving instructions on the basis of the Imperial Rescript concerning education;

2. Education in Korea shall be adopted to the need of the times and conditions of the people.

To carry out assimilation at the lowest strata of the Society, the Japanese planners emphasized more on the elementary and vocational education.<sup>11</sup> The first Governor-General of the Colony Terauchi Masatake

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<sup>10</sup> Soon, Lee-ock, *Colonialism and Education : A Comparative Study between India and Korea*. Unpublished Ph. D Thesis. (Delhi : University of Delhi, 1990) p. 89

“The Japanese dismantled the institutions of 1,000 years of dynastic rule, and accomplished overnight, in 1910, what the dynastic rulers failed to achieve in centuries : the abolition of slavery, codification of civil law, other reforms including separation of the royal household from affairs of state, abolition of the Confucian oriented national exams etc.”

Alice Amsden, *Asia's Next Giant, South Korea and Late Industrialisation*, (New York : Oxford University Press, 1989); p. 32.

<sup>11</sup>The Concept of Universal Primary education was introduced to Korea during the colonial rule. Lee Jay Cho and Kennen Brazeale; n. 8, pp. 571

expressed fears regarding the connection between private education in Korea and national consciousness in his policy speech. Countless numbers of posters with "Independence to Korea" and "Restoration of the State", printed by the private schools were found by the authorities. As these schools provided the teaching of nationalistic philosophy, language and economics, they were immediately put out of such business.<sup>12</sup>

The private school regulations were promulgated in 1911 and again in 1915, by which private schools were required to be licensed under the Japanese government and all teachers were required to reach the standards in moral and Japanese language. This was meant to fulfill what was mentioned in ordinance I. In all the schools Japanese teachers were employed and Japanese language became the sole medium of instructions.<sup>13</sup>

The authority also doubted the loyalty of the missionary schools which they thought were "too close" to their Korean converts. In order to check the influence of Christianity the teaching of Bible and all religious instructions were prohibited.<sup>14</sup> But there were some genuine respect for some of the

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<sup>12</sup> For details See, Lee Ock Soon, "Colonialism and Education- A Comparative Study Between India and Korea", *Unpublished M.Phil. Dissertation*; (Delhi : University of Delhi, 1987). pp. 50-54.

<sup>13</sup> Shin-il Kim, "Korean Education Past and Present", *Korea Journal*. (Seoul. Vol. 27, No.4. April 1987), pp. 4-8.

<sup>14</sup> Lee Ock Soon, n. 10. p. 90

missionaries' educational works like modern and scientific education and education for women.

In the meantime, the educational ordinance was further elaborated by Sekiya, the Director of Education Department in 1917 which aimed to bring up the Korean citizens as subjects of the Japanese empire. Thus excessive control was laid on education, which ultimately resulted in the sharp decline in the number of schools, under the Military rule which lasted till 1919. However after the March First movement of 1919, the Japanese allowed some concessions in education to conciliate the sentiments of Koreans.<sup>15</sup> The duration of years of teaching in schools were extended and was equalized with the pattern of Japanese schools in Japan. Higher education was denied to the native to prevent them from entering into higher professions.

As a result of the education ordinance issued in 1922, the Keijo Imperial University and some nominal schools came to existence. Prior to this, came the 1918 regulations, which declared that Japanese language and arithmetic were to be added to the 'Sodang' or village school curricula where ever possible and practical. Also 1918 regulations directed that the Japanese-

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<sup>15</sup> For detail see, Ki-baik Lee, n. 6, p. 335.

Andrew C. Nahm, *Korea : Tradition and Transformation* : (Hollym International Corporation, New Jersey, 1988), pp. 223-328.

Lee Chong Shik, n. 7, pp. 101-128.

edited edition of the Chinese classics should be used in the 'Sodang' thus preventing the Korean from Chinese influence. The "Sodang" were viewed as makeshift substitutes, until the ordinary schools could be built by the administration. Gradually, ordinary school began to come into existence which enrolled pupils. By 1918, there were 464 ordinary schools having nearly 88,000 students of whom out of seven, one was female. At the same time, there were also 26 private ordinary schools having 2,830 pupils and 24,000 'Sodang' claiming a total enrolment of 1,148,516 students.<sup>16</sup>

Until 1922, the Japanese had their own superior schools facilities, emphasizing much on the elitist groups. As the Education Rescript of 1922 come out, all post-elementary school facilities of both Korean and Japanese were combined into a single education system and were accessible to both Japanese and Koreans equally. But this was only in theory. In practice, only a few Korean got the opportunity and Japanese students dominated most of the formerly all Korean educational facilities. Though a university was established, a limited number of seats were allotted to Koreans which was quite inadequate to equip the Koreans with high talents.

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<sup>16</sup> Basabi Mukherjee. *Japanese Colonial Educational System. A Case Study of Korea and Taiwan. Unpublished M.Phil Dissertation. (Delhi : University of Delhi, 1993).* p. 66



The Japanese government's reluctance to respond to the demand of the Koreans for higher education was directly challenged by the Koreans.<sup>17</sup> From the early 1920s "the society for establishment of the Peoples University" began to raise funds to open a Korean-run university, purely based on its own financial resources and efforts with faculties of literature, agriculture, commerce, industry, medicine and other studies. As a result in 1924, the government opened a State University in order to check the movement. Under the Japanese Governor General Yamanashi, who came to Korea in 1927, vocational studies were once again emphasized at all levels to fulfill the requirements of Japan's military. In 1929, the policy of "one school in every district" was launched to encourage assimilation of Koreans.

In the mid-1920s the education system was supplemented by an extensive network of mission schools, mostly at the primary level. These schools, were providing primary education to some 37,000 pupils, in more than 750 schools that met government standards.<sup>18</sup> The mission also operated two Christian colleges for men, two theological seminaries, a college for women (Ewha college) and a medical College.

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<sup>17</sup> Hyung Chan Kim, "The Americanization of Higher Education in Korea": *Asian Profile*. (Vol. 17, No. 2, April 1989), p. 130.

<sup>18</sup> Lee Jay Cho and Kennon Breazcale. n- 8, p. 573

By 1935, about 1,28,000 Korean pupils were completing elementary education annually and the high schools were producing an additional 11,000 graduate students. Also Korea saw a rapid increase in its enrolment rate at all levels of education between 1925-1940. For instance, the enrolment rate of Korean children between the age of 6-12 years increased from 12.3 per cent in 1925 to 32.7 per cent by 1940 and the enrolment rate of students in the age group 13-18 years increased from 0.8 per cent to 2.4 per cent during the same period. However, in higher education, the rate of enrolment was very low i.e. 0.17 per cent by 1940 in the age group of 19-24 years.<sup>19</sup>

From 1937, education became a subject of fanatic policy of Imperialization, an intensified Japanization as the war intensified in early 1937.

The threefold principles of Japanese-educational policy were- (i) the clarification of national policy, (ii) the achievement of the Japanese and Korean unity; and, (iii) diversion of Labour; which was to be applied to every field of education.<sup>20</sup> The educational reform announced in 1938, was, in theory, the complete elimination of the differences between the Japanese and Korean schools. But in reality, the existing differences were further widened in terms of facilities and financial expenditures. All private schools

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<sup>19</sup> Ibid

<sup>20</sup> Andrew C. Nahm, n- 15, p. 255

and colleges came under the control of government and some Liberal law and Art colleges were diversified to teach science and engineering.

The objective of the colonial education of producing loyal and faithful subjects, remained unchanged in the reforms of 1938 also. The whole system of education was centralized. There was strict centralized control over textbooks, Syllabi, school hours and teaching method. Police was given power to monitor and control the student activities.

The number of Korean scholars in higher education and the proportion of tertiary scholars to total population was extremely small. In the Japanese eyes, the development of higher learning gave birth to the rise of nationalism. Also from their own experience during the Meiji period, they had known the political consequences of higher education. As Mori Arinori, the founder of modern education in Japan said-"..... If education were limited to the primary level, leaders could not be produced". The successful contribution of higher learning in the early phase of modernization of Japan determined the Japanese to minimize the essence of higher education in Korea. The facilities and opportunities for post- elementary education were kept reserved for the Japanese in Korea, who formed half of the students in the secondary stage

and more than two-thirds in the tertiary institutions managed by the government.

Till 1924, Korea had only one kind of special school (Sanman Gakko) which was equivalent in quality to that of special schools in Japan. The limited facilities of higher learning in Korean compelled the Koreans to go abroad for their higher studies. In 1935, 48 per cent of the total students enrolled in tertiary sector were in abroad. Though the Imperial university was opened in order to check the flow of students going abroad, it was not successful as the university was dominated by the Japanese students.<sup>21</sup>

The Meiji experiment of learning Western engineering, science and technology seemed to have encouraged it to emphasize vocational education in Korea, but on low-level training rather than higher education. Of the total scholars, over eighty per cent Koreans were in vocational studies.<sup>22</sup> There was generally no Korean student who was enrolled in any programme other than vocational studies in any of the government run colleges and university.

Inadequate importance was given to technical and engineering education as these were restricted to or reserved for the Japanese. For

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<sup>21</sup> Ibid. p. 252-254;  
Also see, Lee-ock-Soon. n. 10. pp. 128-169

<sup>22</sup> Ibid.

instance, as a proportion of the entire Korean population in 1939, there were places for 5.52 per cent at the primary level, 0.13 per cent at the secondary level and 0.12 per cent in vocational schools. Less than one Korean per 100,000 population gained admission to a university.<sup>23</sup>

Between 1912-1942, the average numbers of graduate engineers in Korea was ten per annum. Since the Japanese had almost no intention to industrialize the colony, whatever a few were there, the demands for skilled professionals and technicians were filled by the Japanese themselves. Out of the total, 94 per cent of technicians in chemical industries and 89 per cent of skilled professionals were Japanese. In 1942, a faculty of science and engineering was added to the Keijo Imperial University, which had earlier a faculty of medicine and a faculty of law and literature.

However, the colonial education system provided some exposure to ordinary people in modern education. The people born during the first three decades of the 20th century were the first generation of Koreans to receive a modern education. It has been argued that the microscopic minority of these who had received modern education during the colonial period did contribute

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<sup>23</sup> Lee Jay Cho and Kennon Brazeale, n-8, p. 572

to Korea's economic and technological development in the post colonial period.<sup>24</sup>

The defeat and unconditional surrender of Japan brought to an end the colonial order in Korea on 15 August, 1945. When the Koreans were rejoicing the end of their traumatic experience, plans were afoot in Washington to bring the area south of the 38th parallel under the control of the American forces.<sup>25</sup>

After the American forces came to accept the surrender of the Japanese forces located in Korea, the area South of the 38th parallel was placed under the United States of America Military Government in Korea (USAMGIK). The USAMGIK occupation lasted until the establishment of the Republic of Korea on 15 August, 1948.<sup>26</sup> Despite many changes during the colonial period, it remained underdeveloped with a variety of problems. In order to better the situation and to develop, education needed greater attention. Hence, the ground for democratic education was created on American model, by abolishing the Japanese education system. A major assertion in this system was the concept of "Hong-Ik-In-Gan" or the notion of the individual giving the

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<sup>24</sup> Ibid.

<sup>25</sup> For details on Colonial and Post Colonial history see, Gregory Henderson, n. 9, pp. 59-184 Also see, Eckert J. Carter, *offspring of Empire: The Ko'chang Kims and the Colonial origins of Korean Capitalism, 1876-1945*, (University of Washington Press, Seattle and London), 1995.

<sup>26</sup> For detailed discussion on American Military rule in Korea see Suk Joon Kim: *The State, Public Policy and NIC Development*, PP. 210-228; Also see, Andrew C.Nahm, n-15, PP. 329-356.

greatest service for the benefit of humanity. The most immediate problems faced by the US authority was the lack of sufficient trained Korean teachers, who could take over the teaching position earlier held by Japanese. Another significant problem was the production of books in Korean script. Hence, a teacher training programme was initiated and many books were printed and published in Korean script. These were some foundations laid by the military occupation for the development of a new type of education.

Following the establishment of the Republic of Korea in 1948, an education law was enacted on the basis of democratic principles. Also, education, as a basic right of the people, was included in the constitution.<sup>27</sup> The law resulted in the introduction of an autonomous educational structure and a compulsory education system. On the basis of the Education Law of 1949, a linear school system of the 6-3-3-4 type came to function and is currently in use. During the Korean war, a 2-year junior college system patterned after the American practice was introduced which later became a part of the Republic of Korea's higher education system.<sup>28</sup> Article 32 of the Education Law gives every citizen an equal opportunity to receive education and guarantees academic freedom, non-partisanship and autonomy of

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<sup>27</sup> Ministry of Education, *Education in Korea, 1996-1997, A Brief outline.* pp. 5-6.

<sup>28</sup> Hyun Chang Kim, n-17.

universities.<sup>29</sup> To realize the goal of education as stated in Article 81, several types of institutions were established i.e. schools, colleges, universities; trade schools, civil schools, special schools etc.

In the midst of the Korean war also efforts were continued to revive Korean education to fulfill the task of overcoming national crisis and for the reconstruction of its economy which was severely affected. After the war, the leadership realized the importance of their extremely limited manpower which had to be relied upon for the reconstruction and economic progress. It, therefore, became important for the government to emphasize education which could play a key role for the development of the nation despite inadequate financial and infrastructural facilities.

In order to improve the overall literacy, as a basic requirement, civic schools were established in 1952 for adults. By 1962 there were 561 Civic schools with an enrolment of 42,000 students providing primary education and 292 Civic high schools providing secondary education to 52,000 students. college students were urged to teach reading courses during their summer vacations to improve the adult literacy. As a result, the adult literacy which in 1945, was a little over 22 per cent; had been increased and was nearly 73 per

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<sup>29</sup> Ministry of Education, n-27. p. 10



cent at the end of 1960. A lot of reform measures were taken. Supplementary in-service education for teachers was introduced and teachers' colleges were created. The national standard admission test for Middle School applicants came into function. Also a number of national and public universities were established and the war-time emergency education act was promulgated.

During the period from 1952 to 1963, Korea got technical and financial assistance from US to rebuild and revamp its colleges and universities. Approximately, 19 million dollars were spent on higher education during the period, out of which a major share went to Seoul National University to make it a world- class University. Large number of students and teachers were sent to US for advance study and training in higher education. The school curricula was revised and kindergarten education were provided to children of 3-5 years of age to encourage physical and mental progress.<sup>30</sup> From 1948 to 1960, Korea's college level institutions doubled, rising from 31 to 62, the number fo college teachers increasing from 1,800 to 3,633 and the college student enrollment soaring nationally from 24,000 to 97,819.<sup>31</sup>

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<sup>30</sup> Hyun Chang Kim. n-17

<sup>31</sup> Henderson, Gregory. n. 9. p.170

In the same period, about 15 per cent of the total expenses for public elementary education was provided by national government, 10 per cent by local government and the remaining 75% by the Parent-teachers Association.

The state government subsidized secondary education to the amount of 6.5 per cent for middle schools, and 4.1 per cent for high schools. Here also the main support came from the parents.

Though there was sharp increase in the number of schools, teachers and students in Middle Schools and High Schools between the period 1945-1960; the increase in the level of higher education during the same period was remarkable.

The awareness to promote education by the Korean parents and teachers besides the state, has probably contributed a lot to the educational development, which is a unique feature, and thus separates Korea from other post colonial countries in this regard.

## **CHAPTER- 2**

## INDUSTRIAL DEVELOPMENT IN KOREA SINCE 1962: PATTERN AND CHARACTERISTICS

In the previous chapter, we had noted why the Koreans have viewed the colonial rule as a traumatic experience and how it marked a striking and significant disjunction in their history. Almost every aspect and every segment of the Korean Society was affected by the totalitarian, awesome, colonial and fascist order with typical Japanese characteristics. To be sure the broad colonial economic objective and framework was created for the benefit of the colonial settlers and masters. This inevitably brought about structural changes which had inherent contradictions, distortions and imbalances, be it in agriculture, industrial development or foreign trade.<sup>1</sup>

The defeat and unconditional surrender of Japan on 14th August 1945 brought about the sudden collapse of colonial order. In Korea, unlike, in many other colonized countries, there was no planned or organized transfer of power with all its ramifications to the liberated people. A series of policies and measures were pursued in Korea by the US and the Soviet occupation forces from 1945-48, which brought about the arbitrary and artificial division of a

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<sup>1</sup> There are several excellent studies on the Japanese Colonial Policies in agriculture, industry, external trade etc. which have highlighted the distortions and imbalances in the economy during the year 1910-1945.

See Bruce Cummings, *The origins of the Korean War: Liberation and the Emergence of separate Regimes* (New Jersey, Princeton University Press, 1981) pp. 39-67

In particular see. Ramon H. Myers and Mark R. Peattie, (eds), *The Japanese colonial Empire, 1895-1945*, (Princeton, New Jersey, 1984)

Eckert J. Carter, *offspring of Empire: The Kôchang Kims and the Colonial Origins of Korean Capitalism, 1876-1945*, (Seattle and London, University of Washington Press, 1995)

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homogeneous Korean notion. Thus, when the Koreans were trying to redress the serious problems of the distorted, undeveloped and structurally and regionally imbalanced, inherited colonial Korean economy, came the sudden division of the Peninsula which had disastrous economic and social consequences. For instance, before 1945 rice and barley were mainly grown in the south, which had 75 per cent of all paddy land while the North led in such crops as wheat and corn.<sup>2</sup> Heavy industrial establishments in the north were reported to be completely destroyed. For example, power production in 1953 was 26 per cent of the 1949 level; Fuel 11 per cent, Metallurgical output 10 percent, chemical production 22 per cent. The value of gross industrial output was 64 per cent of the 1949 amount.<sup>3</sup>

The emergence of two regimes and two state structures, each advancing juridical and political claim to the whole peninsula and the sudden disruption of the movement of goods and people between the two parts of the Korean nation created a volatile situation. Less than 2 years after the establishment of the Republic of Korea on 15th August 1948, the Korean peninsula was drawn into a horrendous war when on 25th June 1950, the North Korean forces crossed the 38th parallel. Never before the world had witnessed such a war in an area of about 85,000 Sq. miles in which there were estimated 4 million casualties including dead and seriously wounded and so much of

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<sup>2</sup> David C. Cole and Princeton N. Lyman, *Korean Development. The interplay of Politics and Economics*; (Cambridge: Harvard University Press, 1971) p. 22

<sup>3</sup> Rinn Sup Shinn and others, *Area Handbook for North Korea*, (Washington D.C. Government Printing office, 1969) p. 297

physical destructions within a short period of three years. When the much delayed armistice agreement was concluded on 27th July 1953, Korean nation and the world at a large welcomed it. Then the Koreans began to address themselves to their gigantic task of recovery and reconstruction of a war ravaged economy. However, it was not surprising that the US, which played the most decisive and crucial role in the defence of Korea, was called upon to intervene massively in the recovery and reconstruction phase. In fact, during the crucial years of 1950-1952 Korea received grant-aid of 330 million dollars from a number of various US organizations and United Nations Korea Reconstruction Agency (UNKRA). During the seven year period of reconstruction (1953-1960) the assistance provided by UNKRA accounted for 120 million dollar while the US grant aid accounted for 1745 million dollars including Public Law (PL) 480 funds for food assistance.<sup>4</sup> The foreign aid financed nearly 70 per cent of total imports between 1953 and 1961 and 75 per cent of total fixed capital formation. Of these about three-quarters was in the form of commodity imports and one half of this was agricultural commodities with the rest going preliminary to fertilizer and petroleum products.<sup>5</sup>

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<sup>4</sup> Kim, Kwang Suk, Joon-Kyung Kim, "Korean Economic Development : An Overview" in Dong Se Cha, Kwang-Suk Kim, Dwight H.Perkins (eds.): *The Korean Economy 1945-1995, Performance and Vision for 21<sup>st</sup> Century*; (Seoul, Korea Development Institute, 1997), p. 13

<sup>5</sup> R.R. Krishnan, "The State and Economic Development in Korea" in R.C. Sharma and Dalchoong Kim (eds.), *Korea-India Trust with Change and Development*, (New Delhi, Khama Publishers, 1993), p. 126

The help and assistance by the US were extended in several other ways also. For example, all major economic policy measures for Korea were decided in consultation with the US through the channels like the Combined Economic Board created in accordance with the "Agreement between the Republic of Korea and the Unified Command Concerning Economic Coordination" (Signed in May 1952). This, however, did not mean that there were no differences of opinion on economic policy measures between the US and Korea".<sup>6</sup>

The student revolutions of April 1960 overthrew the authoritarian and unpopular regime of Syngman Rhee which ruled for 7 years (1953-1960). Following the revolution, the amended Constitution provided for a Cabinet system of government and the popular leader Chang-Myon assumed the office of the Prime Minister. His government tried to introduce democratic polity and launch Korea on the path of Planned Economic Development. The Ministry of Reconstruction was instructed to draft a new five-year development plan that would improve upon and supersede previous efforts. Written with the assistance from the American adviser Charles Wolf, "the new plans stressed the need for a "leading sectors" approach that would concentrate investment in power, coal, cement and several other industries as well as agriculture.

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<sup>6</sup> For a debate on various policy issues with regard to the recovery and reconstruction phase and differences between US and ROK, see Stephen Haggard, Byung-Kook-Kim and Chung-in-Moon. "The Transition to Export. Led Growth in Korea. 1954-1966". in A seminar Paper on *The Role of the State in Economic Development of Republic of Korea*, (James E. West Centre. UCLA) August 14-16, 1987

Interestingly, the new plan embodied an imbalance approach to growth that demanded higher levels of State investment".<sup>7</sup>

It looked as though a historic breakthrough took place in the Korean Citizens' attempt to establish a democratic polity through the extensive participatory processes in the sustained and substantive economic and technological transformation with the establishment of Chang-Myon government. The hope was belied, when Major-General Park Chung Hee, supported by a group of colonels staged a coup-dé-etat and overthrew the government of Chang-Myon. Following the Seizure, General Park and his junta set up a powerful Supreme Council for National Reconstruction (SCNR) which was vested with enormous executive power under the chairmanship of General Park. It imposed normal military rule and launched Korea on a new path of political and economy development.

It was clear though not surprising that the military rulers replaced the political system as had evolved since 1948. What however came as a surprise was the determination shown by the Park regime to impart dynamism to the economy and bring about significant and striking structural changes through a series of bold policy measures and institutions. Park Chung Hee wrote in 1962 : "The key factors of the May 16th Military Revolution was to effect an industrial revolution".<sup>8</sup>

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<sup>7</sup> Ibid.

<sup>8</sup> Park Chung Hee, *The Country, The Revolution and I*, (Seoul Edition, Seoul, 1970) p. 173



The Korean state, especially during the Park Chung Hee era did not mystify the so-called centrality of market forces or make fetish of state intervention in the economy. The state and corporate strategies largely converged even though the state acted in an explicitly interventionist form during this growth-oriented period.<sup>9</sup>

It is now widely admitted and acknowledged that what probably distinguished the Park-era (1961-1979) was the "scale, scope, sweep, speed and success" of the industrial, technological and social transformations. While there are several distinctive patterns of Korean Industrial Development since 1962, a few of them may be highlighted here.<sup>10</sup>

(1) The state's extensive and effective, visible and invisible intervention in the economy was accepted as a prerequisite for mobilizing and galvanizing in the economy.

(2) The state's role was to vary depending on the stages of industrial development and sector of economy.

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<sup>9</sup> R.R. Krishnan, n-5, p. 130

<sup>10</sup> For details see important works of Leroy Jones and Il Sakong, *Government, Business and Entrepreneurship in Economic Development: The Korean Case* (Cambridge: Harvard University Press, 1980); Alice H. Amsden, *Asia's Next Giant: South Korea and Late Industrialization* (New York: Oxford University Press, 1989); E.S. Mason et al. *The Economic and Social Modernization of the Republic of Korea*, (Cambridge: Harvard University Press, 1989); Lee Kyu-Uck, *Government-Business Relation in Korea: With a Special Reference to the Concentration of Economic Power* (Mimco). (Seoul: Korea Development Institute Policy Forum on Private-Public Interaction towards Economic Development, 1989); Byung-Nak Song, *The Rise of the Korean Economy* (updated Edition) (New York: Oxford University Press, 1994); Lee-Jay Cho and Yoon Hyung Kim, *Economic Development in the Republic of Korea: A Policy Perspective* (Hawaii: East West Centre, 1991)

(3) It was a planned development where physical, fiscal and human resources were sought to be fully mobilized.

(4) The export-oriented industrialization and industrialization-oriented export policies were fused and brought into the overall planned strategy and development. The President was vested with enormous power without any substantive checks and balances.

(5) A unique and special place was given to the industrial conglomerates, i.e. Chaebols and special relations were sought to be established between big business and the state. In return for assigning an important place to 'Chaebols' for the country's economy, they along-with the other components of the private sector were expected to play an important role in human resource development specially, in the areas of education and R & D.

(6) Interlinkages between industry and higher education, including technological and vocational education, were to be strengthened in a planned and determined manner with the objectives of generating and providing employment across the industrial sector.

(7) The state was to play both the market substituting and market supporting roles across the industrial sector.

The Economic Planning Board (EPB), the most powerful economic institution which pursued the economic development plans, was created in 1961. It was given enormous power commensurate with its responsibilities. It took over the Bureau of Budget from the Ministry of Finance and the Bureau of Statistics from the Ministry of Home Affairs. Moreover, it was entrusted with the task of preparing the Budget, the determining agent for economic development, and co-ordinating direct foreign investment and foreign capital. The EPB was headed by a senior minister who was given the title of Deputy Prime Minister and made the highest ranking economic policy maker directly accountable to the President. The Five-year Economic Development plans prepared under the direction and supervision of Economic Planning Board were proved competent and professional as they included general policies and goals as well as sectoral programmes. To make it more effective and concrete, the plans were subjected to revisions and ratification as and when necessary."

The first five-year Economic Development Plan was released in 1961 for the period of 1961-1966. The main objective of the plan was to break the vicious circle of poverty and to lay the foundation for a self-sustaining economic development. The strategies adopted in order to achieve the set objectives gave much emphasis on the expansion of basic industries, sufficient supply of social overhead capital and utilization of ideal resources which could help build

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<sup>11</sup> see R.R. Krishnan, n-5, p. 128.

Also see Byung Nak Song, n-10, p. 141-142

John Woronoff, *Asia's "Miracle" Economies: Korea, Japan, Taiwan, Singapore, Hongkong.* (Seoul: Si-Sa-Yong-O-Sa, Inc. 1986). pp. 97-98

an infrastructure required for the economy. Also in this plan, the government included its goals of modernizing traditional values and behaviour, which is noteworthy. It was to resemble a form of "guided capitalism" in which the principle of free enterprise was to be nurtured "but in which the government will either directly participate or indirectly render guidance to the basic industries and other important fields".<sup>12</sup>

In the First Plan, the principal areas of manufacturing industries included electric power and coal which could generate energy; import-substitution industries like cement, synthetic fabrics, fertilizers, oil-refining; and export oriented consumer industries like footwear, textiles and processed foods... all of which were labour intensive in nature. Of these, synthetic fibres, fertilizer and oil refining, which were almost new industries in Korea, were developed at the Ulsan Industrial Complex with the assistance of foreign capital and external loans. The mining and manufacturing sector developed at an annual average rate of 14.2 per cent while the share of manufacturing and mining in the overall industrial sector increased to 25.7 per cent in 1966 from 21.7 per cent in 1962.<sup>13</sup>

Meanwhile, the ratio of heavy and chemical industries in total manufacturing exports accounted for 10.2 per cent per annum on average. The targetted growth rate for the first plan was 7.1 per cent; but the actual growth rate was 7.9 per cent. This remarkable achievement developed a self-confidence with

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<sup>12</sup> Government of the Republic of Korea : *The First Five Year Economic Development Plan* (Seoul, 1962) , p.24

<sup>13</sup> The Federation of Korea Industries : *Korea's Economic Policies 1945-1985*;(Seoul) p.10

strong determination in both the government and business sector justifying the old Korean saying of "*He who tries will succeed*", which began to be heard frequently in the business circles.<sup>14</sup>

Second Five-Year Plan (1967-71) was prepared more meticulously which involved along with the concerned ministries, the Economic and Scientific Council members, research representatives, foreign aid missions and business associations, in its formulation. This plan was based on a sectoral model of the economy and was formulated "to promote the modernization of the industrial structure and designed to build the foundation of a self supporting economy".<sup>15</sup> Thus, the industrial policy was directed towards improving technology and productivity. Parity was given to achieve self-sufficiency in food production; investment in chemical, machinery, iron and steel industries to accelerate and diversify industrialization; continuing expansion of exports; economic modernization of all sectors through raising the level of technology and productivity. The second plan had much the same targets and aims of the first plan.

The Second Five-year Plan period witnessed the development of ISIs (Import-Substitute Industries) with a view to building up the "outward-looking" industrialization process. Capital goods industries like iron and steel,

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<sup>14</sup> Lee Jay Cho and Yoon Hyung Kim, "Major Economic Policies of the Park Administration" in Lee Jay Cho and Yoon Hyung Kim (eds): n-10, p.21

<sup>15</sup> Government of the Republic of Korea : *The Second Five Year Economic Development Plan* (Seoul, 1966) . PP. 33

petrochemicals and electric appliances were included in the ISI drive, while light manufacturing industries like textiles, rubber and plywood were included in export industries. The share of manufacturing and mining industries to the total industry increased by 20.9 per cent at an annual average rate exceeding the original target of 10.7 per cent while that of heavy and chemical industries increased up to 14.2 per cent.<sup>16</sup> The exports grew at 30.8 per cent per annum of which almost half were from the heavy and chemical industries.

Among the major industries, the Korean steel industry has been a typical strategic sector since the establishment of the Pohang Iron and steel company and the Second Plan was a successful one as it achieved the set-targets. While the GNP was expected to grow by 50 per cent from 1965 to 1971 and exports by 147 per cent; the actual achievement in 1975 prices were 79 per cent for the GNP and an impressive 417 per cent for the exports.<sup>17</sup>

In the first two plans some industries were fully dependent on foreign capital, largely as a result of bad management which led to the threat of imbalance in the industrial structure. In order to check this, the Third Five-year Plan put major emphasis on the promotion of heavy and chemical industries and the year 1972 was the beginning of Korea's HCI drive.<sup>18</sup>

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<sup>16</sup> Federation of Korean Industries; n. 13, p. 10

<sup>17</sup> Paul Kuznets, "Indicative Planning in Korea", *Journal of Comparative Economics*. (New Brunswick, 1990) Vol. 14, p. 660

<sup>18</sup> Byung Nak Song, n. 10, p. 137.

The Third Five-Year Plan had the major objectives of "the dynamic development of the rural economy, sustained increase in exports and the establishment of heavy emphasis on the development of heavy and chemical industries in order to avoid dependence on imported raw materials and intermediate goods" and thus to realize a self-reliant economy.<sup>19</sup> The Plan gave priority to balanced regional development. The aim of the consequent HCI was to promote six strategic HCI's viz. iron and steel, nonferrous metals, ship building, industrial machinery, electronics and petrochemicals.

As in the subsequent year i.e. in 1973, the government announced its Heavy and Chemical Industry Development Plan, several targets were sought to be achieved by the end of the prospectus-period. These were : (i) the share of HCIs in the national output was to be increased from 35.2 per cent in 1971 to 51.0 per cent in 1981, (ii) the share of HCI products in exports were to be raised to more than 65 per cent in 1981; (iii) six more industrial estates were to be established for each strategic HCIs : Kumi for electronics, Changwon 'base' for machinery and defence, Pohang for iron and steel (already established), Ulsan for ship building and petrochemicals, Yeochun for petrochemicals and Omsan for nonferrous metals.<sup>20</sup> As a result technologically sophisticated industries began to appear in Korea. To finance for the development of HCI, National

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For details on HCI plan, Also See, Suk Chae Lee, "The Heavy and Chemical Industries Promotion Plan, in Lee-Jay Cho and Yoon Hyung Kim, n. 10, pp. 431-472

<sup>19</sup> Susan MacManus, "The Three 'Es' of Economic Development and the Hardest is Equity : Thirty Years of Economic Development Planning in the Republic of Korea"; *Korea Journal*, (Seoul : August-September 1990), p. 10

<sup>20</sup> Rajiv Narayan: "Macro-economic Planning in the Republic of Korea, Stages and Strategies". Unpublished M. Phil Dissertation (New Delhi : Jawaharlal Nehru University). p. 86

Investment Fund was founded in the financial year of 1974. The investments in new industries produced some positive results, with development in electronics, shipbuilding and other sectors. Shipbuilding was the first consumer sector to be targetted, with indigenous suppliers of steel on the way. By 1975, major projects were completed by Hyundai, Samsung and Daewoo, all private sectors while the initially government-owned Korea Shipbuilding and Engineering expanded somewhat.<sup>21</sup> Another consumer of steel i.e. the automotive industry was developed by the initiatives of private sector such as Daewoo, General Motors and Hyundai. During the Plan, the government undertook the New Village Movement or Saemaul movement to drastically improve the income and living conditions of rural people and to overcome the rural urban imbalance in growth.<sup>22</sup>

During the Third Plan period, the growth rate of heavy and chemical industries was 10.1 per cent per annum while that of manufacturing and mining sector was 18.1 per cent per annum on average. The share of HCI in the manufacturing sector increased to 45.6 per cent and the share of export of HCI to the total exports was 29.8 per cent by the end of 1976. Despite the disruption caused by the first oil shock in 1973, the Third Plan was a success as reflected by the Korean economy which actually grew by 11.2 per cent per annum as against a projected annual growth rate of 8.6 percent.<sup>23</sup>

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<sup>21</sup> John Woronoff, n. 11, p. 110

<sup>22</sup> Byung Nak Song, n.10, p. 137

<sup>23</sup> Federation of Korean Industries, n. 13, p. 12



A significant motive behind Korea's turn to the HCI plan was to upgrade the composition of its exports. It achieved considerable success in diversifying its market, of which the growth of construction industry was an important aspect in the Middle East and Europe. The development of an internationally competitive HCI sector with the efforts of the government and participation of Chaebols provided Korea its base of competitive edge in exports.

When the Fourth Five-year Plan (1977-1981) was formulated, Korea was undergoing the crisis of balance of payment. Hence it sought self-reliance in financing investment and equilibrium in the balance of payment by the end of the plan period. This plan was a very ambitious plan in the sense that its basic objective was to achieve structural shift in the manufacturing sector so as to ensure long-term viability of Korea's export-oriented development strategy; to distribute broadly the benefits of growth; to acquire a self-sustaining economy through employment expansion and manpower development; and to promote and improve its technology and efficiency.<sup>24</sup>

Further the plan emphasized the deepening of the industrial structure by promoting "... Skilled labour intensive industries such as electronics, machinery and shipbuilding" to enhance its international export competitiveness. It stated its priority at upgrading technology sophistication and greater efficiency thus : "Increased productivity throughout technological innovation and improvement in

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<sup>24</sup> Walter E. De Souza, *South Korean Economic Miracle*, (Pune : Dastane Ramichandra & Co., 1998) p. 80

efficiency are the keys to Korea's high rate of growth."<sup>25</sup> Besides these, it also included a definite attempt by the government to alleviate the problem of small and medium enterprises. In July 1980, the government introduced a major programme that helped the small and medium enterprises to borrow up to 30 million won from the Medium Industry Bank without collateral.

During the Fourth Five-year Plan, the development of electronics industry by the private sector of technological skills, set the pace of progress. The period also accelerated the import substitution of computers and semiconductor which was out of Korea's area of industries till 1976.

In the Fourth Five-year Plan period the growth in the manufacturing and mining sector decreased to 10.3 per cent per annum while there was a sharp increase in the growth of HCI, i.e., 51.8 per cent in 1981. The account of exports by the HCI was 45.3 per cent of the total output. This growth was mainly because of high export growth in iron, steel and shipbuilding industries.

It was quite disappointing that the overall performance in the Fourth Five-year Plan was unsatisfactory in comparison to the domestic demand. Also, the plan to promote technology-intensive industry was not fully successful.<sup>26</sup> It was for the first time since its formal planning, that the actual growth rate of 5.7 per cent was much lower than the target of 9.2 percent.

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<sup>25</sup> Susan A. MacManus. n. 19, p. 12

<sup>26</sup> Federation of Korean Industries. n. 13. p. 13

With the assassination of President Park on October 26, 1979 and by the end of the Fourth Five-year Plan, the so said initial phase of industrialization entered the matured phase from the beginning of the Fifth Five-Year Plan. It is important to mention here that Korean planning process was the gift of Park era. The economic development by nature, was pro-growth. The economy grew, exports grew, industrialization deepened and in overall, the actual growth rates exceeded the planned targets. Till the beginning of the Fifth Five-year Plan, Korea had already become a trade surplus economy. After Park, Chun Do-Hwan, another military leader came to power.

By the time Korea launched the Fifth Five-year Plan, it had already emerged as the most rapidly developing industrial and trading country. The basic objectives of the this Plan (1982-1986) were "stability, efficiency and balance".<sup>27</sup> During the period, the necessity to speed-up export-led growth was the immediate requirement as the initial phase of 1980s saw a very slow economic growth with high inflation and rapidly expanding foreign debts. Hence, the Plan aimed at increasing productivity and international competitiveness by co-ordinating development of metallurgical industries, emphasizing domestic demand, guaranteeing normal operation of capital goods industries in a bid to ensure the continued development of such technological and skilled labour-intensive industries such as electronics and machinery. Further, the Plan emphasized for the first time "the principles of a

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<sup>27</sup> Ibid.

market economy encouraging private initiative and creativity".<sup>28</sup> The major changes in trade policy during the period included intensive promotion of export goods and diversification of markets. As social development was included with the Economic Development Plan machinery, creation of sufficient employment opportunities became another target. For an amicable solution to all these problems, productivity growth was the means and to achieve this, the state gave much priority to technology and skilled-labour intensive industries than to the HCIs.

The strategic industries included in the plan were precision machinery, electronic products like TV, VTR, semiconductors, industrial information and communication. The policy makers took bold step to encourage technical assistance on the production floor to correct deficiencies in operating practices and to improve the level of skills and productivity of labour by means of intensified, on-the-job training programmes.

During the period, the growth rate of mining and manufacturing sector was 9.6 per cent per annum and that of heavy and chemical industries to the manufacturing sector was 57.0 per cent. The ratio of mining and manufacturing sector to the total the industry was 29.9 per cent.<sup>29</sup>

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<sup>28</sup> Government of the Republic of Korea : *The Fifth Five Year Economic and Social Development Plan* (Seoul : 1982) , p. 83

<sup>29</sup> Federation of Korean Industries. n. 13, p. 9

The Sixth Five-year Economic and Social Development Plan (1987-91) looked beyond developing an economic structure for self-sustaining growth and represented the first phase of laying the foundation for achieving the status of an advanced state in the 21st century. During the Plan, the three major objectives were : (i) competition between government and major sections of society to establish an economic and social system for all people to realize their potential fully; (ii) co-operation between Korean business leaders and workers to restructure industry and improve technology level; and (iii) the government would provide incentives to promote balanced regional development to establish a fair market order. In the period, the major contents of policy reforms included the reduction of government regulations constraining growth of enterprises and extensive promotion of liberalization of finance, imports and foreign exchange.<sup>30</sup>

In 1988, there was a change in the leadership as the more democratically-leaning Roh Tae-Woo replaced Chun Doo Hwan. Hence there was a revised Sixth Five-year Plan which was an attempt at economic democratization. The revised Plan put more stress on qualitative improvement of the economy, providing for equal economic opportunities and private initiatives in further economic development. The plan also called for institutional reforms and assigned priority to help alleviate the underprivileged and lagging

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<sup>30</sup> Byung Nak Song, n.10, p. 139  
Also See, Walter E. De Souza, n. 24, pp. 105-107

sectors of the economy. The constructions industry saw a tremendous growth in the period.

In 1991, at the end of the Plan period, the overall economic growth rate was 8.4 per cent and industrial production impressed by 8.3 per cent. While the share of export of light industrial products declined, that of heavy and chemical industrial products increased by a 10 per cent on an average. In the industrial structure, the GNP share of each sector of industry underwent a major change, with agriculture, fishery and forestry decreasing to 8.1 per cent from 9 per cent in 1990 and the manufacturing and mining sector to 27.9 per cent in 1991 from 29.9 per cent in 1961.<sup>31</sup>

After assuming the office, in February 1993, President Kim Young Sam revised the Seventh Five-year Economic and Social Development Plan so as to fit in with his term of office, which was for the period of 1993-1997. This Plan focussed much on internationalizing the economy. To sustain growth, incentives were offered to improve science and technology. Liberalization of domestic market with free trade principles was emphasized. Since the launching of the Kim-Young Sam government, its policies had been focussed on change and reform in a bid to prepare for national reunification and joining the family of advanced economies which was fulfilled in 1996 when Korea joined the OECD club.<sup>32</sup>

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<sup>31</sup> Korea Annual (Seoul), 1992, p.174

<sup>32</sup> Korea Annual (Seoul), 1992, p. 123

Private sector were called upon to lead and be the locomotive of growth and hence institutional reforms were made. For instance, in 1993 the government revised or scrapped a total of 966 administrative rules with a view to providing fair market competition, easier access to industries and price controls.<sup>33</sup> Financial and tax regulations were eased for a wider opening of the financial markets for foreign investor. Moreover, to expedite industrial restructuring the government decided to focus on technological innovation by increasing the R & D capabilities.

During the period, (1993-1996), the industries grew at an average rate of 7.4 per cent. While the mining and manufacturing sector grew on an average of 7.3 per cent in 1995, the agriculture, fishery and forestry sectors' growth further decreased to 3.5 per cent in 1995.<sup>34</sup>

It is also important to stress that there existed a correlations between the scale and pattern of industrialization and the availability and utilization of human resources during the first sixteen years of rapid industrialization (1963-1979). Total employment increased at an annual average rate of 3.7 per cent. The growth rate of non-agriculture employment was 7.2 per cent, much higher than that of total employment. The growth rate of manufacturing employment was much higher nearly 11 per cent. This significant rise in employment

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<sup>33</sup> Walter E. De Souza. n. 24, p. 111

<sup>34</sup> Korea Annual. n. 32, pp. 123-124

brought about a gradual decline in the unemployment rate from 7.9 per cent in 1963 to 3.8 per cent in 1979 to the 2.6 per cent in 1996 despite a continuous expansion of the labour force.<sup>35</sup> This shift in labour market condition could be explained by parallel upward movement in both the vacancy ratio and real wages.

On the whole, the experience of Korea with planning has been very dynamic and positive as far as its achievements are concerned. What actually distinguishes the planning process in Korea from other countries is not the formulation of the plans but the proper and are effective implementation of it.

There is hardly any ex-colonial divided small nation with a population little over 40 million which has witnessed such a remarkable and rapid socio-economic and technological transformation within a short span of three and a half decades. As a result of remarkable growth of GNP from 2.3 billion US dollars in 1962 to about 480 billion US dollars in 1996, exponential growth of exports from 55 million US dollars in 1962 to 12,220 million US dollars in the end of 1996 and imports from 422 million US dollar in 1962 to 13,597 million US dollars in the end of 1996, per capita income from 87 US dollars in 1962 to 10,548 US dollar and other impressive strides in social sectors, Korea could emerge as the 11th largest economic power, the 15th largest trading power and

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<sup>35</sup> Kwang Suk Kim and Joon Kyung Kim, n. 4



be counted among the top thirty nations in terms of human development indicator.

## **CHAPTER- 3**

# ROLE OF HIGHER EDUCATION IN INDUSTRIAL DEVELOPMENT OF KOREA: QUANTITATIVE AND QUALITATIVE DIMENSIONS

In the previous chapter we have discussed the pace and pattern of Korean industrialization since 1962. We noted how as a result of rapid and remarkable growth of GNP, impressive industrial and technological development marked by significant and striking structural changes and an overall growth in other economic indices; Korea has achieved the status of a nation among advanced economies. We also noted that one of the crucial factors that contributed to the deepening and diversifying of the industrial and technological profile was priority assigned commitment and concerted action displayed by the State and society for the development of human resources, especially higher education, scientific, technical and vocational training.

In this chapter an attempt is made to examine the correlation between the pattern of higher education and the pattern of industrialization.

In the first chapter while presenting an historical survey of education from the establishment of Yi-dynasty to the end of the Second Republic (1392 1961), we had noticed five distinct stages or phases of development.

Prior to the launching of its planned strategy of development, with the First Five-year plan, Korea had achieved almost universal literacy by 1960. As its "industry-led-economic-growth" began from the First Five-year Economic Development Plan in 1962, the State adopted an educational policy with a human resource development strategy, based on the premise that, "human capital plays a crucial role in the economic progress of a nation". The government planned the educational provision on the basis of a manpower plan which attempted to estimate the demands for different skills in industries. During the first phase of Park Chung Hee's administration, the Ministry of Education prepared a Five-year Educational Reconstruction Plan for the period 1962-66. It targetted the middle-school level.<sup>1</sup> Surprisingly, despite its various attempts to curtail the enrolment rate in high school and college levels, its enrollments exceeded predictions by 30 per cent and 38 per cent respectively.<sup>2</sup>

In order to develop general education, the government increased its spending on education over the years. Educational spending which was 2.5 per cent of the total budget in 1951 rose to over 17 per cent in 1966.<sup>3</sup> It constituted only one-third of the total national expenditures. The other two-thirds came from the private

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<sup>1</sup> Park's education policies stressed socio-economic development and aimed at integrating educational policies with the First Five Year Economic Development plan by tying the expansion of higher-level enrolments to the rate of growth in the school age population. See Tun-Jen Cheng, "Dilemmas and Choices of Educational Policies, The Case of South Korea and Taiwan, Studies in Comparative International Development, vol. 27, No. 4, Winter, 1992-93, pp. 54-79

<sup>2</sup> Ibid.

<sup>3</sup> In 1996 of the total budget, education budget accounted for 19 per cent.

sector and parents.

In the 1960s, as Korean economy was concentrated mainly in the labour-intensive industries, the skills and educational qualifications needed for the labour force was minimal and the state had already had a relatively educated manpower to fulfill the requirements of the industrial sector. Hence the scope for development of higher education was almost negligible till the first half of the 1960s.

However before the Second Five-year Economic Development Plan was formulated in 1967, the government emphasized higher education with an international perspective and "science and technology" orientation. It was mentioned that the new perspective and orientation could act as a driving force behind the industrial take-off of the state.<sup>4</sup>

Following the pattern and role of science and technology in the economic progress of many developed nations like US and Japan, Korea adopted a two-pronged strategy to increase the scientific and technical capabilities, which was to be accomplished through :-

- (i) building-up of a domestic science and technology infrastructure, both by improving and expanding its scientific and technological education standard, and,
- (ii) by acquiring foreign technology. As the first one was not possible

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See Ministry of Education, Education in Korea, 1996-97, A Brief Outline (Seoul ), p. 40

<sup>4</sup> Dong-Hyung Kim, "The Development of Indigenous Science and Technology Capabilities in Korea", *Korea Journal*, (Seoul : February 1990) pp. 20-23

without achieving the second one; it preferred the second one to be acquired first.

To deal with the increasing demand for science and technology, Korean Institute of Science and Technology (KIST) was established in 1966 with the financial and technical assistance of United States Agency for International Development (USAID). It was the state's first integrated, multidisciplinary, technical government R & D Centre to support industry technology learning.<sup>5</sup> Following this, the Technology Promotion Law was promulgated in 1967 and, "The Ministry of Science and Technology" (MOST) was established focusing on the creation of basic institutional structure and advancement of R & D activities to strengthen achievements in science and technology for national development.

The government increased the enrollment quotas in science and engineering while limiting the intakes in social sciences and humanities. New departments in social sciences were restricted and research grants were made available more to projects with practical application than to basic research. Considerable efforts were made to encourage students toward vocational and technical schools and colleges. Graduate education, which in the past was limited largely to medicines and that too to a few prestigious universities such as Seoul National and Yonsei, was extended to science and engineering and was strengthened

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<sup>5</sup> Ibid.

Also see, Linsu Kim and So-Mi Seong, "Science and Technology : Public Policy and Private Strategy" in Dong Se Cha, Kwang Suk Kim, Dwight H. Perkins (eds), *Korean Economy, 1945-1995 : Performance and vision for the 21<sup>st</sup> Century*, (Korea Development Institute, Seoul, 1997) p. 393

through the establishment of more graduate schools.<sup>6</sup>

As a result, in the University level, in science and engineering the enrolment rate was highest between 1962 to 1971. The number of students pursuing science and engineering education at 4-year Colleges increased from 22,630 in 1962 to 1,39,298 in 1971. For 2-year junior colleges the corresponding figures went up from 6,945 to 1,06,389 during the same period. Moreover, in the course of educational expansion the rate of enrolment increased sharply in all levels of formal education. In the primary level, there was a five times increase between 1973 and 1994. In the secondary level, it increased more than 25.8 times between 1945 and 1984, and in colleges and universities increased more than 142 times during the same period.<sup>7</sup>

It is important to mention here that in 1969, the National Council for Long-term Educational Planning (NCLEP) was established to plan for both secondary and higher education. But it failed to receive adequate funding from the budget. Therefore, it was soon replaced by the educational policies which worked effectively through its proper implementation.

In the beginning of 1970s, as the industrial structure deepened, it led to an increased demand for scientists and engineers in the academic system. Hence science and technology development policy was coordinated with the economic development plans. Further, the export-promotion strategy, adopted by the

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<sup>6</sup> Jasbir Sarjit Sing; "Higher Education and Development", *Prospects* Vol. XXI, no. 3 (UNIDO; Vienna, 1991) p. 392

government for maintaining the industrial growth produced some positive result on technological learning in industry along with the two-pronged strategy mentioned above, for the development of scientific and technological development. The state promoted "technology transfer" or "import of technologies" from advanced countries, by the means of capital goods imports which in turn forced the Korean firms to take initiatives in learning-through-doing.<sup>8</sup> The knowledge and techniques incorporated in the foreign capital goods was translated into knowledge embodied in the people by the efforts of the existing educated workforce and entrepreneurs of Korean firms, thus giving rise to a high technological capability for the economy as a whole.<sup>9</sup>

To improve their productivity local businesses started fastening their technological learning from the 'imported technologies'. Also the emergence of an international competitive market condition forced the firms to invest heavily in technological learning in order to adapt and improve the imported technology and to maintain their international competitiveness in quality production. The acquired foreign technology was effectively distributed across the firms within an industry and across industries within the economy, which helped in the upgradation of the overall technological capability. The state promoted the distribution process through specialized agents such as capital goods producers, engineering consulting firms and Government Research and Development Institutes. Foreign personnel

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<sup>7</sup> Linsu Kim and So-Mi Seong; n. 5, p. 394

<sup>8</sup> As Republic of Korea was lacking technological capability at the initial phase of its economic development, it had to rely heavily on foreign technology.

<sup>9</sup> Linsu Kim and So-Mi Seong; n. 5, p. 390



were also employed in different foreign and indigenous firms introducing new productions processes, managerial know-how and financier expertise. In 1973, National Council for Science and Technology was established with the objective to facilitate communication and dispersion of R & D related information and data at the international level.

At the time when Korea announced its Heavy and Chemical Industry plan, i.e. in 1973, it did not have the required financial resources, skilled and technically efficient manpower, and business experience, all of which were important for successful constructions and operation of HCI sector. But given certain favourable factors, such as an abundant labor force with low wage rates and the state-of-the-art facilities, by which it could start and thereby acquire comparative advantages against advanced countries having relatively old facilities the state took steps to build HCI.<sup>10</sup>

As the HCIs began to expand, development of appropriate technology was required. It demanded more advanced foreign technology. Further, the successful adoption of foreign technology required "absorptive capabilities".<sup>11</sup> In order to produce the said capabilities, the universities were entrusted with special mission-oriented postgraduate schools for educating high-calibre scientists and engineers under the responsibility and supervision of MOST. The academic system deviated its mission from basic research to intrinsic scientific and technological

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<sup>10</sup> Suk-Chae Lee, "The Heavy and Chemical Industries Promotion Plan" (1973-79), in Lee-Jay Cho and Yoon Hyung Kim (eds), *Economic Development in the republic of Korea A Policy Prospective*, (Hawaii, East West Center, 1991), PP.439.

development through the elevation of production assessment and validation of ideas. Special graduates school programme was introduced to impart training to the top-line scientists and engineers. There was a nation-wide expansion of graduate programmes, which aimed to meet further needs at least in quantity. But it resulted in the deterioration of quality. To correct this problem, in 1975, the government opened the Korean Advanced Institute of Science (KAIS), a state financed graduate school of applied science and engineers, offering both master and Ph.D programmes. KAIS was located in the neighborhood of KIST so that the two could co-operate and collaborate to the maximum extent possible.<sup>12</sup>

As several qualitative industry emerged, the demand for diversified technology became higher which KIST could not meet effectively. So the government established a number of independent industrial research institute in various fields. These include metals, electronics, nuclear energy, chemicals, telecommunications, shipbuilding and marine science. These institutes worked independently with sufficient financial assistance and certain incentives provided by the government. The government also encouraged technical high schools and junior technical colleges as well as four-year engineering colleges, to increase their enrollment specialized technical schools were established in order to produce technicians for special fields such as precision machinery, electronics and steel, while general technical schools provided the skills.

The influence of these new developments was sharply felt in the

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<sup>12</sup> Dong-Hyung Kim; n. 4, pp. 20-24.

electronics department whose students' number increased rapidly to keep pace with the development of these industries. The number and variety of courses in electronics leading to Masters and Ph.D degree increased. The courses ranged from semi-conductor and electronic materials, digital system, communications, automatic control and measurement, and computers. The number of electronics departments increased from 4 in four-year colleges in 1965, to 36 in 1975 and further to 100 in 1988; while in graduate schools the numbers rose from 3 in 1965 to 21 in 1975 and 75 in 1986.<sup>13</sup>

After the end of the Third Plan, the policy makers observed comparatively the competitive aspect of Korean industries with other developed countries in high-technology sectors. They realized the necessity of more advanced and sophisticated basic science and applied science needed for their industries. Hence Korea Science and Engineering Foundation, KOSEF, was set up in 1977 to support researchers in accumulating modern technology. The big business groups, i.e. the "Chaebols" were requested to establish one research centre per company and small and medium enterprises were advised to organize research consortia. As a result, Republic of Korea had 129 private research institutes and 18 research consortia.<sup>14</sup>

In 1960s and 1970s, although the character of Korean industry was more of labour-intensive light industry, it entered the HCI, the capital and

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<sup>12</sup> Ibid

<sup>13</sup> Jasbir Sarjit Sing; n. 6, p. 394.

<sup>14</sup> Dong Hyung Kim; n. 11, p. 23.

technology-intensive sector; there was little demand for domestic R & D to improve imported technologies and to develop indigenous technologies. The government had also no policy instruments to create demand for corporate R & D. Still the government took some initiatives in indigenous R & D efforts in the early years.

Table-7 (see Appendix) shows that the total R & D expenditures increased steadily from 1.2 billion won in 1963 to 282.5 billion won in 1980. The government played a major role in R & D activities in early years when the private sector failed to make sufficient R & D investments despite government's strong efforts to encourage such activities. But over the years, from 1963 to 1980, the state's share of total R & D witnessed declining trends. With the help of attractive incentives offered by the government and increasing technological competition the number of corporate R & D centres increased significantly, i.e. from 1 in 1971 to 54 by 1980, their task was mainly concerned with imitative reverse engineering from the imported technologies rather than with innovative research and development.<sup>15</sup> Universities, which accounted for 85 per cent of the high calibre scientists and engineers with Ph.D degrees in Korea, made little progress in R & D as demand for innovative technology was absent. Though the government provided several incentives for R & D activities, most of the industries ignored the offer because of the easy availability of foreign technologies which they could acquire, assimilate and used in their production facilities.

Throughout the 1960s and 1970s as its industrial structure was more

of the labour-intensive and export-led nature, the not so highly built-up but being capable of learning through imitation of mature technology, the almost literate labour force, helped Korea to come out of poverty. But the situation was something different as it saw the emergence of a new international environment of "industrial-competitiveness" in the beginning of the 1980s. The state was forced to change export-oriented growth strategy due to the hesitant attitudes of protectionist policies of European and Latin American countries who were exporting technology through their capital goods to it. Secondly, Japan also became reluctant to transport technologies as it saw a growing challenge from Korean industries. On the other hand, the increasing real wage rate, i.e., at an average of 5.8 per cent in the 1960s and 7.5 per cent in the 1970s, caused the loss of its competitive advantage of labour intensive industries. The state also witnessed a change in the political structure with the end of the Park era in 1979.

The new government of Chun-Doo-Hwan, reevaluated and recognized the education policy mainly the science policy. Technology became the urgent national development goal. It became imperative for the state to built up its own technological capability to strengthen its bargaining power against foreign technology and to undertake its independent innovation. It started to give R & D the attitude it was deserving and 'innovation' become the watchword among the industrialists and government officials.<sup>16</sup> To achieve its objectives, high-technology efficient industries were to be developed in accordance with a comprehensive

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<sup>15</sup> Linsu Kim and So-Mi Seong; n. 5, p. 393.

<sup>16</sup> *Ibid.* p. 398.

technology policy. The state made a shift in its major policy which had to reduce state interventions in the market mechanisms.

Problem of disparity, i.e., inequality between small and big business sectors due to the monopolies of Chaebol in the 1970s, was sought to be checked by the promotion of technology-based small and medium enterprises. The government established some important institutions such as the Small and Medium Industries Promotion Corporation (SMIPC), the Korea Trade Promotion Corporation (KOTRA), and the SME- related R & D centre to support in developing their technological capability.<sup>17</sup> The focus of the industrial policy during the period was shifted from the promotion of strategic sectors to that of innovative sectors which could produce qualitative items. Hence, to improve the effectiveness of science and technology policy making, KIST and KAIS were merged into KAIST (Korea Advanced Institute of Science and Technology). In addition to KAIST, Korean Institute of Technology (KIT) was established in 1985 as a special undergraduate training center to educate the scientifically gifted student to fulfill the need of highly technology- intensive industries, i.e., highly qualified scientist and technical experts. Soon it became an integrated part of KAIST. In this way, KAIST was developed as a unique R & D institute.<sup>18</sup>

Moreover, to utilize the existing research capabilities in operation, the equipment and manpower of 16 government supported research institutes were consolidated into 9 institutes under the preview of the MOST. Including KAIST,

these were:-the Institute for Advanced Energy Research, Electrotechnology and Telecommunications Research, Standards Research and Ginseng and Tobacco Research; Institute of Energy and Resources, Machinery and Metals, Electronics Technology and Chemical Technology.<sup>19</sup> Since their rearrangement, these institutes have been constantly contributing to the industrial progress, through the development of new products, processes of production and improvement of imported technology.

An extensive network of state, public and private technical support system have been introduced to promote technology diffusion among the small and medium enterprises. Although some of such types of institutions existed in the 1970s, more numbers flourished in the 1980s. Some major institutions were:-

(i) Industrial Advancement Administration (IAA), a government agency to co-ordinate the functions of different technical support agencies for both large and small firms;

(ii) The National Industrial Technology Institute (NITI) and 11 Regional Industrial Technology Institutes (RITI) which together with the SMIPC constitute a national network of technical assistance services; and,

(iii) The Korean Academy of Industrial Technology (KAIT), which together with other Government Research Institutes and industry- specific R&D

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<sup>17</sup> Ibid. p. 400

<sup>18</sup> Dong Hyung Kim; n. 4, p. 24.

<sup>19</sup> Ibid.

institutes under trade associations comprise a crux of R&D network for technology diffusion.<sup>20</sup>

Onwards 1980, perhaps the most significant effort made by the government in science and technology development was in the area of indigenous R & D activities. This was all the more necessary because the government emphasized the upgradation of industrial structure by the development of hi-tech industries such as micro-electronics, biotechnology, new materials and information industries.

The government began to continue special science and technology promotion meetings which were attended by representatives from industries, government-supported research institutes and academia. The meetings approved the creation of an indigenous science and technology base through enhancement of the quality of its R & D structures.<sup>21</sup>

There have been two sources of Korean investment in R & D activities. First, the state provided direct R & D which helped in promoting universities and public institutes for basic and applied science and joint research projects between these academic institutes and private corporations. Secondly, the state provided indirect incentive packages such as preferential financial and tax concessions to

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<sup>20</sup> Linsu Kim and So-Mi Seong; n. 5, p. 403.

<sup>21</sup> Choong Yong Ahn and Joo-Hoon Kim, "The Trade Policy and Industrial Development", n. 5, pp. 359-360.



industries which in return helped them to intensify their R & D activities.

Government Research institutes were established to deal with the increasing sophistication and diversity of industries; each designed to develop in-depth capabilities in an area of high industrial priority such as shipbuilding, marine resources, electronics, telecommunications, energy, machinery and chemical etc.

Two high technology centres were set up; (i) Seoul Science Park and, (ii) Taedok Science Town. Seoul Science Park started with three GRIs and three economic research institutes but has failed to attract private R & D centres in surroundings. On the other hand, the development of Taedok Science Town has been actively promoted, where 14 GRIs and three tertiary educational institutions have been located.<sup>22</sup> Also, it has attracted over 11 corporate laboratories. Eighteen more firms have planned to establish their R & D Laboratories there within a few years making it the first high-tech "Valley" in the country.

Two important research institutes in the Taedok Science Town are :- (i) Electronics and Telecommunications Research Institute (ETRI) and, (ii) Korean Aerospace Research Institute (KARI), and both are regarded as major strategic fields for future oriented technological development. The R & D activities of ETRI are mainly targetted at research into basic and advanced technology, semiconductors, telecommunications computers and information strategies and

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<sup>22</sup> Linsu Kim and So-Mi Seong; n. 5, p. 404.

Also see, sang-Chul Park, The High Technology Policy in South Korea and Taiwan : Taedok Science Town and Hsinchu Science-based Industrial Park, *Korea Observer*, Vol. XXVIII, no. 2, Summer 97, pp. 219-230.

technology. Its achievements are remarkable : TDX (Time Division Switching System), TICOM (Medium-sized Computer), 4M DRAM semiconductor chips, CDMA Digital Mobile System; which are some of the most sophisticated industrial products of the state in the 1990s.<sup>23</sup> ETRI is also operating the Industrial Technology Enhancement Centre in order to strengthen the competitiveness of manufacturing industries by supporting R & D activities in information and telecommunication technologies.

The KARI was established in 1989 and its primary role includes R & D in aerospace technologies, technical support to the relevant industries and assistance to the government. It is carrying out regional transport projects focussing on medium-size aircraft, the KOMPSAT (Korea Multipurpose Satellite) project to produce main components in the spacecraft bus and payloads used for earth observation, communication experiments etc., Electrical Power Distribution subsystem (EPDS) and sound rocketing projects. It has already launched its Science-1 and Science-2 rockets in 1993 and carried out technical monitoring on the Delta-II lunch vehicle launched in 1995 successfully.<sup>24</sup>

Research activities in universities have been comparatively less developed, though universities accounted for 33.0 per cent of the nation's R & D manpower and 73.7 per cent of its Ph.D-level R & D manpower in 1993. R & D expenditure in universities accounted for 5.4 per cent in 1971, 10.5 per cent in 1987 and 7.2 per cent in 1993 of the nation's total R & D budget. However, the

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<sup>23</sup> Sang Chul Park; n. 22, p. 225.

government has made attempt to promote R & D activities in universities since the mid-1970s as a result of which a research oriented S & T school was founded in 1975 and another one was started in 1995, establishing a new research tradition in university education. The Basic Research Promotion Law enacted 1989 to strengthen basic research as one of the nation's top technological priorities. A new scheme was started under which a chain of Science Research Centres (SRCs) and Engineering Research Centres (ERCs) in universities were established. By 1993, 14 SRCs and 16 ERCs were established.<sup>25</sup>

The GRIs have been the backbone of advanced R & D in Korea. These institutes have been utilized as major instruments for the Industrial Base Technology Development Project (IBTDP) which concentrates on problems in technology areas with high economic externalizes, the national R & D Project (NRP) and the Highly Advanced National R & D (HAN or G-7) Project. The GRIs are undertaking most of these projects in cooperation with private firms. The University Research Laboratories are also playing a great role by undertaking these projects with financial support from MOST and MOTIE (Ministry of Trade, Industry and Energy), jointly with private firms and GRIs. The most ambitious project is undoubtedly the HAN R & D project, also known as the G-7 project as it aims at upgrading Korea's technological capabilities to the level of G-7 countries within a decade (1992-2001). It has two parts : (i) Product technology development project , which includes new drugs and chemicals, Broadband Integrated Services

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<sup>24</sup> Ibid, p. 228.

<sup>25</sup> Linsu Kim and So-Mi Seong; n. 4, p. 405.

Digital Network (B-ISDN), next generation vehicle technology, and high definition television (HDTV); and, (ii) fundamental technology development project which includes ultra-large scale integrated circuits, advanced manufacturing system, new materials for electronics, and energy industries, environmental technology, new functional bio-materials, alternative energy technology, and next generation nuclear research reactors.<sup>26</sup>

From table 2 it is observable that with the emergence of competitive market and the common support through various incentives, private sector begins to play the major role in investment and development in R & D activities after 1980. The Korean economy recorded one of the world's fastest growth rates, but its R & D expenditures rose even faster. The share of R & D spending in GNP (R&D/GNP) increased from 0.32 per cent in 1980 to 1.95 per cent in 1990 and to 2.33 per cent in 1993. Out of the total investments in R & D the private sector accounted for 83 per cent in 1993.

Since 1980, the R & D investments by domestic companies has increased at an annual average growth rate of 19.2 per cent (at 1985 constant prices). The number of research institutes of private companies increased from 54 in 1980 to 2,000 in February 1995. In 1993, the industrial sector accounted for 55 per cent of the total R & D personnel.

Vocational education and training in both formal and non-formal sectors has also made a large contribution to the success of the Korean

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<sup>26</sup> Ibid, p. 406

industrialization. In fact, the Republic of Korea's successful industrialization has been largely based on vocational and technical education and its timely emphasis on the widespread provisions of education and training at the secondary and higher educational institution level.

Though vocational education was given priority from the beginning of its industrialization process and a few vocational training centres were existing before 1966, it was from 1967 that a serious and systematic planning began with the legislation of the Vocational Training Law.<sup>27</sup> Public Vocational Training Centres were established throughout the country with the objectives of producing skilled workers as well as providing training opportunities for workers from low-income families to better their qualifications as well as career.

Technical high schools were also established and expanded. These schools were grouped into four categories on priority basis with specialized functions to respond to the demands for specialized skills in industries; (i) the mechanical high schools were given high priority to produce precision machine workers; (ii) the specialized technical high schools to train skilled workers in electronics, steel manufacturing, railroad maintenance and architecture; (iii) the demonstration schools to produce skilled workers for industrial firms abroad; and (iv) the general technical schools to produce general skilled workers.<sup>28</sup> But as values'

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<sup>27</sup> In republic of Korea, the provision of a large-scale programme of technical and vocational education has been a central element in long-term planing since this period.

Paul Morris: Asia's Four Little Tigers; *Comparative Education*, Vol. 32, no. 1, 1996, p. 102

<sup>28</sup> Proceeding of the Regional Seminar on Technical and Vocational Education and Training : An Overview; Sponsord by Asian development Bank, 22-27 Jan, 1990, Manila;

changed and the technical workers had aspirations to become college graduates, the vocational high schools transformed themselves into junior colleges. In-plant training was soon made compulsory for all industrial enterprises with 300 or more workers through an amendment to the Vocational Training Law in 1976. This forced the private enterprises to develop skilled craftsmen to meet their own needs. Also the private enterprises were encouraged to establish vocational training centres.

These vocational training centres opened more occupational avenues for unskilled labour to catch up with high skilled labour. It increased the participation of the labour force and changed its distribution as population shifted from agriculture to industry and services sector. It also transformed their operational dissolution, creating more professional, technical and skilled workers to be absorbed in the industries.<sup>29</sup> In 1987 there were 313 public vocational high schools with about 2,80,000 students and 277 private high schools with 4,53,700 students. As a proportion of all high school enrolment, the enrolment in Vocational high schools was about 32 per cent. The employment rate of graduates of the vocational training institutes was ranging from 95 per cent to 99 per cent during the period 1983-87. The employment rate of these vocational school graduates is higher than that of general school graduates. In 1986, about 30 per cent of the graduates were employed.<sup>30</sup> But in 1990s, as the industries move into more sophisticated high-technology area, the vocational education system becomes

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Also see, Ahn Seung Chul; *The Role of Human Element in the Republic of Korea*.

<sup>29</sup> Tum Jen Chang; n. 2, p. 55.

insufficient in providing the required technologies.

As a result of rapid educational expansion at all levels, the number of universities has increased from 69 in 1966 to 138 in 1994. The enrolments in universities during the period 1970-75 was doubled and further doubled during 1975-80. Open universities were established with emphasis on experimentation and practical exercises. Beginning with the Kyonggi Open University of Technology in Seoul in 1982, at present there are 18 open universities with about 103,376 students. In these universities priority in selection is given to responsible persons from industrial organizations, holders of national technical qualifications and graduates from vocational technical schools.<sup>31</sup> In order to increase the efficiency of workers by providing them opportunities for education, these universities offer an educational system to the industrial complex. Out of the total number of universities established, the private sector has a major share, i.e., around three-fourth of the universities are private.

From the beginning of its planning process, the state has been providing facilities for students to send them abroad for overseas training and education. A large number of students returning after completing their training abroad could easily find employment in the huge industrial complexes set up by Chaebols.

When economic progress of Korea began to take off with its

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<sup>30</sup> Proceeding of the Regional Seminar; n. 28, p. 26.

<sup>31</sup> Ministry of Education; n. 3, p. 26

industrial growth, there was massive educated unemployment problem. To absorb these unemployed, the creation of sufficient employment opportunities was seen as the ultimate requisite of the time. Hence from the very beginning the economic policy has been focussing on enhancing the economy's ability to absorb the increasingly educated labour force into the modernized industrial sector. To accomplish the goal of both employment creation as well as economic growth, the five-year economic plans emphasized an export-oriented labour intensive industrial policy from the First to Fourth Plans and technology-intensive industrial strategy from Fifth Plan onwards. As a result, the size of the employment had expanded enormously from 1963. The number of employed has increased over two and a half times from 1963 to 1994, i.e., from 7,563 thousand in 1963 to 19,837 thousand in 1994. There are two factors responsible behind such an expansion:-

(i) its standard labour markets that could flexibly mobilize human resources necessary for fast economic growth; and

(ii) its consistent annual GDP growth rate of around 8 per cent on an average during the period.<sup>32</sup> The annual employment increase-rate during the period 1963-1994 was 3.3 per cent on an average. Also, the unemployment rate was reduced substantially over the period from 8.1 per cent in 1963 to 2.4 per cent in 1994.

With the rapid expansion of manufacturing sector, workers' skill has

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<sup>32</sup> Sookon Kim and Ju-Hu Lee, "Industrial Relation and Human Resource Development", in Dong-Se Cha, Kwang Suk Kim, Dwight H. Perkins (eds) n. 5, p. 603



been improved through the provisions of on-the-job training, provided by the industrial units. The employment rate in manufacturing sectors has increased from 7.9 per cent of the total employed in 1963 to 27.8 per cent in 1994. Contrary to this, the employment rate in the agriculture, forestry and fisheries sector, has declined from 63.0 per cent on 1963 to only 13.6 per cent in 1994.

Korea has also a well educated cadre of managers in line with its engineers. They are recruited from the universities and different institutions. The newly recruited managers in diversified business groups are trained first in short courses oriented to understanding company culture. Then they are assigned training on the job and also on outside courses. Courses on quality control are offered to them by the Korean Bureau Standards and KAIST. They are also sent abroad to learn about in-plant experience.<sup>33</sup>

The intensive training programme of managers helps the industries with the reward of putting imported as well as innovative technologies and machinery into operation. If the wage factor is taken, the persons in managerial positions earned more than four times the production workers from 1971 through 1984. It indicates the value of labour force having higher education. Although both the number of managers and engineers increased absolutely between 1960 and 1980, the later's increase was far greater than the former which recognizes the importance of technical education in the manufacturing firms.

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<sup>33</sup> Alice H. Amsden, *Asia's Next Giant, South Korea and Late Industrialisation*, (Oxford University Press, 1989), pp. 228-229.

The relative contribution rate of labour-input to Korea's economic growth is substantially higher than the rates for capital and other factors. For instance, the relative contribution rate of labour input was 40.7 per cent between 1965 and 1985, more than twice the contribution of capital that was 19.8 per cent in the same period. Further, the working hours per week for the labour force is perhaps the longest in the world, i.e., around 53.6 hours per week, and 4.5 days of vacation per year in (1980s) which shows the strong determination and spirit of the labor force.<sup>34</sup> The state has been successfully in exploiting the "can-do-spirit" and *eui-yok* (will or ambition) of the workforce by enhancing their education standard and thus creating legendary work ethics.

The success story of industrial development will be incomplete without a brief discussion of the Chaebols' contribution to its technological development and vice-versa. Chaebols have been the driving force behind the industrial development in every stage, i.e., in expanding production and raising its exports in the 1960s and 1970s; and in developing high-technology industries by diversifying their sourcing of technologies in the 1980s, and 1990s. The 'outposts' set up by Chaebols in developed countries like the US and Japan help them in emulating advanced technologies in semi-conductor and computer industries and they also serve as training posts for scientists and engineers from R&D centres and manufacturing plants in Korea. Chaebols have also made strategic alliances with

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<sup>34</sup> Ibid, p. 205

In 1996, the average workweek constituted 47.3 hours and in manufacturing unit it was 48.3 hours.

Also see, Korea Annual 1997, (Seoul) p.180

multinationals in high-tech areas such as IBM, Hewlett-Packard and Toshiba which in return provide important inputs to their manufacturing and processing technologies.<sup>35</sup>

Chaebols have invested heavily in developing and strengthening their in-house R&D activities to absorb, assimilate and adapt imported technologies and their own innovative activities. For example, Samsung set-up 12 new R&D centres during the 1980s. In 1989, Samsung spent \$900 million; Hyundai and LG spent \$600 million each; and Daewoo \$300 million in R&D. Of these, 80 per cent was for electronics sector and 18 per cent for chemicals.<sup>36</sup>

The growth of electronics industries has a major contribution in the advancement of Korea's technology frontier. Two Chaebols have a major chunk of electronics industries in Korea, LG and Samsung. Among the electronics industries, semiconductor and computer are the two most developed. The strongly motivated high calibre Korean engineering manpower trained abroad and within the state itself as well as in technical cooperations with multinational firms has resulted in the production of 64K DRAM (Dynamic Random Access Memory), a Samsung product, it has also tackled 4M,16M and 256M DRAM, all self created designs. To avoid duplicate research and investment, the government has designated the R&D of the DRAMs as a national project, as a result of which Samsung is now the largest and the most formidable DRAM designer and producer in the world. The Electronics Switching System (ESS) and optical fibres are going to become high-

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<sup>35</sup> Linsu Kim and So-Mi Seong; n. 5, p. 412.

technology products in telecommunications in the near future.<sup>37</sup>

The computer industry has been concentrating mainly on the development of mass productions know-how based on cheap labour force and has been investing 4-5 per cent of their revenue in R&D activity to compete with technologically advanced countries. A government entity, KIET (Korean Institute of Electronic Technology), has been established to function as suppliers of high-technology required by the electronics industry to develop itself into a strategic one for the export market as well as to provide research and development capacity for applying advanced technology to domestic needs. It is also the central body for the development of micro-electronics and software.

In terms of employment, the contribution of the electronics industries is quite significant. It was approaching 3,00,000 workers by 1985. Meanwhile, the share of engineers and technicians in total employment rose from 18 per cent in 1978 to 27 per cent in 1985. Much of this is attributable to the rising automation level especially in semi-conductor assembly. Employment in the local electronics sector numbered 4,77,000 persons in 1990, which was 9.8 per cent of the nation's total manufacturing employment of 4.8 million. It is also notable that out of the total workforce, 60 per cent were female workers in the age group of 18-24, which shows the enthusiasm of females for national development.

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<sup>36</sup> Ibid.

<sup>37</sup> Ibid; p. 414.

Also see, Sanjay Sharma : The State and Industrialisation in Korea; A Case Study of the Electronics Sector Since 1969; *Unpublished M. Phil. Dissertation*, (Jawaharlal Nehru University, New Delhi; 1993); pp. 63-79.

In case of Pohang Steel Corporations (POSCO), it is the rigorous overseas training in technology and management that provided a large number of engineers and supervisors. The commitment as well as determination of the employees put the industry in the front rank with an export of more than 40 per cent in the first half of 1972-84. Before its Operation-597, POSCO personnel received on- or off-job training in Japan and the US.

It provided training to its workers to improve the performance of each piece of product. Between 1965-1979 training courses in one or other forms included roughly 61,400 workers. In 1984 alone, 9,900 workers received training, some 1,000 of them in computer application. The early success of POSCO can be attributed to its Quality Control Division emphasizing quality on its agenda in the early 1973 resulting in the establishment of QC department. Till 1977 it was entrusted with heavy task. However, spurred by the energy crisis, it began to concentrate heavily in R&D as a consequence of which, in 1985, out of the total 260 employed in R&D, 148 were researchers with 12 Ph.D and 112 technicians.<sup>38</sup> Additionally, POSCO emphasized on-the-job training in operations for all its technical managers. Newly recruited engineers with university backgrounds were required to work on all three shifts in order to become familiar with every operation. Presently, POSCO also runs engineering college and technical training school in

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<sup>38</sup> The POSCO's R&D includes, "The Research Institute of Industrial Science and technology (RIST) and Pohang University of Science and Technology (POSTECH) were put in charge of basic science and applied research areas; the POSCO research Institute (POSRI) in charge of management consulting and human resources development; The POSCO Technical Research Laboratories in charge of short-term research projects related to on size manufacturing and others. See, POSCO Report, 1995, pp. 21-22.

Pohang. The improvement of labour productivity has resulted in its dropping of employee per ton shipped from 32.65 in 1975 to 9.62 in 1984.<sup>39</sup> POSCO's increased steel productions, for which its labor force is solely responsible, has greatly boosted Korea's self-sufficiency rate from 20 per cent in 1972 to 90 per cent in 1995. The guiding principle of "our own ships, our own engines, our own designs" placed Hyundai Heavy Industries as the world's largest ship-builder by 1984, i.e. within a decade after its building up of the first ship in 1973.<sup>40</sup> Here also "labour productivity", which is a function of the degree of equipment automation, the skill level of operators and the quality of ship designs, has helped in achieving the success. For instance, Seoul National University alone provided 36 per cent of its naval architecture graduates to the ship-building industry. In time, foreign technical assistance mainly, from Japan, and learning-by-doing also helped Hyundai Heavy Industries (HHI) in developing its ship-building know-how. In 1978-79, HHI launched its quality improvement programme. The QC department revised all its standards and issued a new 'worker quality manual' and accordingly qualifications were set for its technical workers in the production departments. Further, it established a Welding Research Institute in November 1983, which aimed at developing and managing new welding technologies, monitoring quality control towards high productivity level by reducing the cost and man hours. Out of its total labour force, engineers and technicians accounted for 10.8 per cent in 1978.

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<sup>39</sup> Alice H. Amsden, n. 33, p. 306

For details on POSCO see, Korean Iron and Steel Association, 1994, *The Steel Industry in Korea*; also see, State and Steel Sector in South Korea, A Case study of POSCO, *Unpublished M Phil Dissertation*, (New Delhi : Jawaharlal Neheru University, 1996)

<sup>40</sup> Alice H. Amsden, n. 33, p. 273.

In 1984, HHI opened its Maritime Research Institute, one of the most well equipped institutes of its kind in the East. This also provides architectural consultations to its engineers.<sup>41</sup>

In the automobile sector, Hyundai Motor Company is a leading one. In 1974 it constructed its integrated automobile manufacturing facilities. At first it also adopted the "importation of technology" procedure from different countries. But by 1979, when exports appeared on its agenda, it established its own engineering centre. The industrial engineers in the Methods Engineering Department have a high educational level and high status in the plant as they are the people responsible for developing new production methods. There is also a Quality Department to inspect its quality of production. The earlier established Engineering Centre is responsible for the design of its vehicles, which was managed by graduates from the Seoul National University in the 1980s.<sup>42</sup>

In other areas of industrial activities such as textile, some heavy and light machinery industries, pharmaceuticals and construction-related industries like in cement, Korea has demonstrated its advantage in production-technology as well as product-inventing technologies. Through its manufacturing industries, it has showed that it is able to produce the articles or goods, i.e., the products of advanced countries, with better quality and low production costs. For this, it has the experts in

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<sup>41</sup> Ibid, p. 288.

<sup>42</sup> Ibid; p. 178; The plant manager graduated from the Korea Naval academy and had been a Vice-president of HMC for a long time.

Also See, Wilfred Lutkenhorst, *Industrial Development and Industrial Policy in the Republic of Korea with Special Emphasis on Engineering Industries*; *Industry and Development* No. 25

engineering and technology and also superbly organized production lay-outs backed by devoted employees who share a common purpose of development.

Thus, it is the planned and well-organized education system of Korea which has resulted in its tremendous industrial development. The efficient human resources development strategy adopted especially in "science and technology" and "vocational and technical training supplemented with an on-the-job training" has produced skilled and hard-working manpower consistently. And it is indeed this manpower which acted as the 'engine' of industrial development in Korea.



## **SUMMARY AND CONCLUSION**

## SUMMARY AND CONCLUSION

There are excellent and exhaustive studies on various aspects of economic transformation in the Republic of Korea since 1962 when the First Five-year Economic Development Plan was implemented. It is also well-known that Korean education has experienced an extraordinary growth during the last about three and a half decades. It has been a catalyst of a remarkable industrial, technological and social progress. And yet there has hardly been any full-length study or monograph in English on the nexus between development of education and industrial and technological transformation. In this dissertation a modest attempt, ~~an~~ an exploratory exercise, is made to examine the evaluation of the correlation between the patterns of industrialization and education during the years 1962-1996.

The dissertation has three chapters. The first chapter presents a historical survey of the development of education with a focus on the period from the emergence of Chosen (Yi-dynasty) in 1392 to the eclipse of the Second Republic in 1961. The second chapter deals with the pace and pattern of industrialization since 1962. The third chapter highlights the role of higher education in industrial development and examines in detail the quantitative and qualitative dimensions.

The historical survey of the development of education from 1392 to 1961 has been divided into five parts, i.e., (a) the Yi-dynasty (1392-1910); (b) the

Japanese colonial rule (1910-1945); (c) the Post-liberation period and the United States Military Government in Korea (USMGIK) rule in Southern part of Korea (1945-1948); (d) the First Republic under President Syngman Rhee, (1948-1960); and, (e) the Student Revolution and the Second Republic (1960-1961). Since each part has had distinct characteristics with regard to the basis and orientation of the education system, it would not be proper to find a unilinear or continuum or uninterrupted development in education in the history of Korea from 1392 to 1961.

The Yi-dynasty was chosen as the starting point of the historical survey of the development of education for a number of reasons. A few may be mentioned here. The Yi-dynasty was the last and the longest of the Korean monarchical dynasties. It saw the zenith of Confucianism which not only became the state ideology but also the dominant and hegemonic ideology, especially, from the 17th century to the 19th century. Secondly, Confucianism had a pervasive influence on the polity, economy, culture, bureaucracy and education systems during the Yi-dynasty. The Yi-dynasty also witnessed towards the end of the 19th and beginning of the early 20th century, the dismantling and disintegration of the Confucian edifice as a result of challenges from within and without. Finally, it has been argued by some analysts that one of the important factors that contributed to the contemporary economic transformation was the Koreans' yearning and commitment for education inherited from the Confucian cultural tradition of the Yi-dynasty. It

was felt that this argument needed to be examined with a view to understanding the development of education in a proper historical perspective. During the Yi-dynasty, the Yangban elite sought to impose its hegemony on the majority by "legal and de facto inherited status, privileges, land-holding, office-holding (in the central bureaucracy) and utilization of Confucian orthodoxy for the legitimization of status and economic interests". An important access or passage to bureaucratic power was qualifying in the Confucian-oriented Civil (Service) examination system which produced an elite class of scholar-officials. To appear in the examination, the children of Yangbans were sent to an "academy", either private or government run, which was the hub of the education system. The student-intake capacity of the academies used to be fixed. For example, National Academy of Seoul had the capacity of 200 students to take the 'munkwa' (highest civil service examination), open to the legitimate children of the Yangbans. It has been estimated that in the beginning of 18th-century there were 600 academies and by 19th-century the number rose to 680. It may be stressed here that the Yi-dynasty saw that the education system was based exclusively on Confucianism, propagated a Confucian world-view and social philosophy of rigid hierarchical structure and oriented towards fulfilling the bureaucratic aspirations of the Yangban elite. However, towards the later half of 19th-century the entire Confucian-centric education, polity, economy and social structure began to disintegrate as a result of revolts and rebellion from within, like the Tonghak uprising, and cultural, economic and territorial challenges from Japan and the Western powers at times. Thus, two

aspects of the challenges as far as the Korean education system may be referred to.

In the last decade of the 19th century, western influences began to pose a challenge to the Yi-dynasty social structure and education system. For instance, Christian School founded by American, German, and English missionaries admitted individuals of any social background. In July 1894, the distinction between Yangbans and commoners was legally ended, and examinations for government posts no longer were based on the Confucian classics. Christian schools began to increase their influence on education through its expansion. For example, in 1902 there were 63 missionary schools with 993 pupils, by 1907, 508 plus 22 high schools and two theological schools with an estimated 13,288 students under American missionary alone. By 1909, the Christian College, Union Christian College and Ewha College had made deep marks on higher education.

The second phase, i.e. Japanese colonial rule in Korea (1910-1945) marked a traumatic disjunction in the national history of Korea, <sup>which</sup> unlike most of the colonies of the European powers, had existed as a distinct and homogeneous ethnic, cultural, linguistic entity in well-defined territory for centuries. Almost every aspect, every segment and section of the Korean Society was effected, albeit in varying degrees by the oppressive, awesome, colonial totalitarian order. The education system like the agrarian, industrial, bureaucratic and commercial systems had the objective of sustaining and

strengthening the colonial edifice. Under the Japanese administration the education system was highly centralized.

And yet it is important to note that the colonial education system was completely different from the education system of the Yi-dynasty in several ways. For instance, for the first time a clear distinction emerged between Yangban-based knowledge-oriented education and literacy-oriented universal primary education under the aegis and control of the state. The colonial rule emphasized the latter since it was felt that semi-literate population would be more productive and more loyal subjects of the state.

As a result, an active campaign was launched for increasing enrolments of students in government schools which were founded by the colonial government. The enrolment figure showed a phenomenal rise, from 16,000 in 1910 to 95,000 in 1918. Once the government's effective and extensive education system was established in the first few years of the colonial rule the western missionaries' influence began to decrease, especially, in the primary and middle school levels. How successful was the colonial efforts to spread primary education is to be judged from the fact that about 50 per cent of Korean children in 1945 had received compulsory primary education. Colonial education system also emphasized Vocational education in Korea. While the emphasis on Universal primary education was significant, colonial administration did not want to place equal emphasis on secondary, higher and technical education. This becomes clear from the fact that there was only one

secondary student for every 700 population in Korea, and these schools were mostly located in the urban areas.

In 1927, only 9 students out of every 100 primary graduates went to secondary stage and by 1937, the number of pupils who went beyond primary education was barely 5. Similarly, the number of Korean scholars in higher education and the proportion of tertiary schools for total population was extremely small. The industrial schools provided low-level technical training and were designed to equip workers for non-administrative positions in industry and agriculture. Special schools prepared Koreans for lower government posts. It was only in 1942, a faculty of science and engineering was added.

Thus, the colonial education system which was forced on the Koreans was structurally flawed, imbalanced, discriminatory and essential oriented towards the exacting demands of the Japanese military and industrial sector. It was, therefore not surprising that a completely restructured education system oriented towards the needs and interest of the Koreans was a major agenda of the anti-colonial movement. The realization of the agenda had to wait for the disintegration of the colonial order.

The defeat and unconditional surrender of Japan on 14th August 1945 also brought an end to the Japanese colonial rule in Korea. "They were indeed incandescent and intoxicating moments for Koreans". While the dawn of freedom was hailed by the Koreans, the twists and turns in the

relations between the US and the Soviet Union as Japan's surrender became imminent , seemed to have indefinitely postponed the inalienable right of the Koreans to shape their national destiny without outside interference. Ironically, at the moment of their national ecstasy, Koreans became the victims of Cold War, another phase of Allied occupation and artificial and arbitrary division of their homogeneous nation. The area south of the 38th parallel came under the occupation of the United States of America Military Government in Korea (USAMGIK). The occupation ended under extraordinary circumstances and the Republic of Korea was proclaimed on 15th August 1948.

The USAMGIK interregnum witnessed reforms in various areas including education. Three aspects of the new education system introduced by the American government may be emphasized. They are :(a) creation of the ground for democratic education by abolishing the Japanese education system; (b) creation of sufficient trained Korean teachers through teachers' training programme and (c) production of books in Korean script.

There was uncertainty about the continuity of these reforms. Less than three months after the May 10, 1948 election, under the aegis of United Nations Temporary Commission on Korea (UNTCOK) in the southern part of the peninsula, the Republic of Korea came to be established on 15 August, 1948 with a constitutional commitment to democracy. The constitution set out broad objectives, orientation and agenda of the new state. The constitution, among other things, announced a new education philosophy which in itself was



unprecedented in the history of Korea, thus marking the fourth phase in the survey of development of Korean education since 1392. An Education Law was enacted on the basis of the democratic principle. Article 32 of the Education Law gives every citizen an equal opportunity to receive education, guarantees academic freedom, non-partisanship and autonomy of universities. To realise the goal, several types of educational institutions were established.

Less than two years after its establishment, the Korean peninsula was plunged into a devastating war during 1950-1953. Efforts were made to restructure and reorient education. An impressive commitment was displayed to sustain education during the tragic years of the Korean War. However, there was no visible link between education and import-substitution industrialization. This may have been due to the chronic political instability and the US dependent economic growth. The deepening political instability and economic crisis, the total alienation of the citizens against the corrupt and authoritarian regime became the major factors behind the student revolution of 1960.

Following the successful revolution, the popular government of Prime Minister Chang Myon, with a commitment to ushering in a credible, viable, democratic polity and less dependent economy, came to be established in August 1960. It was hoped that since the students who had made enormous sacrifices to bring in a new political social order, radical transformation of the education system could find a place in the agenda of the Chang Myon government. Even as the Chang Myon government was trying to work out a

comprehensive development strategy which could address, among others, the vital issue of employment, the military coup d'état of 16 May, 1961 overthrew the government and Korea entered a phase of uncertainty in all fields, including education.

It was only after the military leadership stabilized its power and authority, the interim Supreme Council for National Reconstruction (SCNR) made public its programmes and policies including in the domain of education. Thus, as was stated earlier, there is no unilinear development in education in the history of Korea from 1392 to 1961.

The pattern of economic development during the years 1962-1996 has been examined in the second chapter. This has been done with a view to understanding the nature of linkages that existed between patterns of development in economy and education. The seizure of power by military in May, 1961 marked a turning point not only in the political but also in the economic history of Korea. Following the successful and what has generally been recognised as a bloodless coup, the issue of political economy of the new paradigm of development has assumed great significance. The three interrelated issues, i.e., political stability, national security and economic growth were articulated by the military junta as the major concerns of the country. These three issues became the rationale as well as the excuse for controlling the entire society. Although the SCNR came to be replaced by direct

presidential election in 1963, the three issues mentioned above continued to be on the agenda of the third, fourth, fifth and sixth Republics.

It could be said that one constant feature in the political paradigm of Korea was the role of the state, its authority and autonomy and the extent and effectiveness of its intervention in politics, economy, education and other aspects of the society. Since state played a central role in setting the pattern, parameter, priorities of economic development, all required resources including financial and human, came to be mobilized to achieve predetermined targets. Thus, in order to understand the context and specific aspects of the linkages between patterns of development in economy and education, it is important to look at the comprehensive and holistic view taken by the state on the whole question of planned capitalist development as distinct from sporadic and spasmodic growth, be it in industrial sectors like textile or social sectors like education. Here four important features of the Korean pattern of state-led capitalist industrialization may be highlighted :

(a) the state promoted a phased and planned manner of industrialisation through its formulation and successful and timely completion<sup>of</sup> Five-year Plans. The effective planning process in Korea was started in 1962. Economic Planning Board was created and was entrusted with the task of making and supervising the plans. Since then seven Five-year Plans have been carried out. The First Five-year Plan sought to build an export-oriented industrial base principally through<sup>u</sup> construction of basic industries. On the basis of the progress

achieved during the first plan, the second Plan stressed industrial expansion with an objective of modernising the industrial structure. The third Plan is significant as Korea entered the area of heavy and chemical industries during this Plan aimed at increasing its exports. The Fourth Plan was an even more ambitious one. It had the basic objective to achieve structural shifts in the manufacturing sectors which could ensure long-term viability of Korea's export-oriented development strategy the Fifth Plan emphasized the pursuit of economic stability, efficiency and development. In this Plan, quality production by developing technologies was stressed much. As by the end of the Fifth Plan Korea had attained the status of a Newly Industrialised Country. Hence, the Sixth Plan projected more of the same, i.e., greater emphasis on qualitative aspects of the economy. The Seventh Plan in brief, was aimed at laying the foundations for greater efficiency and more equity in distribution through investing more on infrastructure, industries and upgrading technologies. In all the Plans, the state sets the targets in every aspect of growth and as the results were observed, the actual achievement exceeded the targetted rates, except in the Fourth Plan.

(b) the state helped to create and favour in several ways the industrial conglomerates - "Chaebols" - and assigned them certain strategic industries for speedy development, like automobile, ship-building, electronics, etc..

(c) the state played both "market-substituting" and "market-supporting" roles. For example, the all important steel sector was under the direct control of the state.

the state played a direct and decisive role in promoting exports.

Since the Korean economy developed in a planned manner, including in the vital export sectors, planning of human resource development with an emphasis on higher education became imperative.

It is against this background that the third chapter has sought to delineate and analyse the place and role of higher education during the years of dynamic industrial and technological transformation (1962-1996). As we had noted earlier, Korea came to adopt a twin strategy of Five-year Economic Development Plans and export-led industrialisation. In fact, the strategy pursued in Korea was a fusion of both export-led industrialisation and industrialisation- led exports, which were indeed the two sides of a coin. The planned industrial development and planned export promotion passed through distinct phases and stages. Therefore, the focus on human resource development and more specifically, the orientation of higher education varied across the developmental phases. The demands for qualified engineers and technicians varied depending on the thrust areas of industrial development. For example, the demands for qualified engineers and technicians in chemical, steel, ship-building, nuclear power, automobile and electronics varied. The

capacity and capability to adopt and adapt, absorb and assimilate foreign technology also differed from industry to industry depending upon the educational training, skill of the workforce and terms of workers. In order to enhance the education level and skill of the workforce, the subject of higher education came to be defined by the state in relation to economic development. Educational policies were linked with manpower planning. In the initial phase of its industrialisation, there was a quantitative expansion in education. This expansion included the increase of the student population, the expansion of educational facilities and growth in the number of teachers.

In the 1960s, as the economy was concentrated mainly in the labour-intensive industries, the skill and qualification needed for the labour force was minimal and the state had already had an abundant relatively educated manpower. Before the formulation of Second Five-year Economic Development Plan, the government emphasised higher education with science and technology orientation. It sought to build a domestic science and technology infrastructure by improving its scientific and technical education which resulted in establishing of prominent institutes like KAIST, KIST, KOSEF etc., with the diversification of Korea's industrial structure there was a perceptible increase in the enrolment quotas in science and engineering departments. In the middle of the 1970s, as the state saw a change from labour-intensive to capital-and-technology-intensive industrial sectors, it needed scientists and research engineers who could promote creative assimilation of

foreign technology as well as capable of inventive and innovative technologies.

Hence the state promoted the "import of technologies" which in turn forced the Korean firms to take initiatives in learning-by-doing.

As several qualitative industries began to emerge after the HCI Plan was adopted, the demand for diversified technology became higher. To fulfil the demand, the government established a number of independent industrial research institute in various fields. These institutes were provided with financial assistance.

From the beginning of the 1980s, technology became an urgent national development goal. As Korea entered the qualitative phase of its industrialisation, research and development began to draw the attention of the government. A number of government-supported and private R&D Institutes came into being, with the increasing sophistication and diversification of hi-tech industries. Industrial parks like the Seoul Science Park and Taedok Science town where created in order to upgrade the standard of the industrial workforce to advanced nations. Vocational and technical high schools and colleges were expanded in both public and private sectors to train skilled workers in electronics, steel manufacturing, precision machinery, etc. These vocational training centres provided more professional, technical and skilled workers to the industries. With the rapid expansion of the manufacturing sector, workers' skill was improved through the provision of on-the-job training.

The state, in co-ordination with the Chaebols tried to pursue concerted national higher education policies which helped to develop and strengthen the country's scientific and technological capacities. The state also encouraged the Chaebols to set up their independent research centres. Chaebols have invested heavily in developing and strengthening their in-house R&D activities. For example, in 1989, Samsung spent \$900 million, Hyundai and LG spent \$600 million each and Daewoo, \$300 million in R&D. It helped them to absorb their own innovative activities. Further in the R&D sector the share of spending to GNP increased from 0.32 per cent in 1980 to 1.95 per cent in 1990 and to 2.33 per cent in 1993. It is important to mention here that out of the total investment in R&D the private sector had accounted for a major share, i.e., 83 per cent in 1993.

The state has also increased its overall allocation on education over the years. Educational spending, which was 2.5 per cent of the total budget in 1951, increased to over 17 per cent in 1966 and 19 per cent by 1996. <sup>Govt. expenditure</sup> <sup>R</sup> constituted <sup>0</sup> only one-third of the total national expenditures, <sup>on education.</sup> The other two-third came from the private sector and parents which indicates the commitment of the private sector as well as the Korean society towards education. Thus, with the required support coming in from all spheres and directions, higher education played a very determining role in the industrial development of the Republic of Korea, especially since 1962.



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## APPENDIX

**TABLE-1****REGISTERED STUDENTS IN KOREA BY TYPE OF SCHOOLS  
SELECTED YEARS 1910-1937 (10<sup>3</sup> STUDENTS)**

Types of schools	1910	1919	1930	1937
<b>Primary Schools</b> (Years 9-6)				
For Japanese	15.5	42.8	67.4	89.8
For Koreans	20.1	89.3	450.5	901.2
<b>Middle Schools</b> (Years 7-12)				
For Japanese	0.2	2.0	5.8	7.8
For Koreans	0.8	3.2	11.1	15.6
<b>High Schools For Girls</b>				
For Japanese	0.5	1.9	8.3	11.9
For Koreans	0.4	0.7	4.4	7.1
Teacher's Seminaries	0.0	0.0	1.3	3.8
Industrial Schools	1.1	4.5	15.3	26.6
Colleges	0.4	0.9	2.5	4.0
Universities	0.0	0.0	0.6	0.5
University Preparatory Schools	0.0	0.0	0.3	0.4
Non-standardized Schools <sup>a</sup>	71.8	39.2	47.5	142.0
Total <sup>b</sup>	110.8	184.5	614.4	1,211.4

Source : UNESCO (1954; 23)

a. Includes short-course elementary Schools

b. Column Totals are subject to rounding errors.

**TABLE-2****RESEARCH AND DEVELOPMENT EXPENDITURES (1980-1993)**

	1980	1985	1990	1993
R&D Expenditures	282.5	1,237.1	3,349.9	6,153.0
Government	180.0	306.8	651.0	1,039.0
Private Sector	102.5	930.3	2,698.9	5,117.0
Govt. vs. Private	64:36	25:75	19:81	17:83
R&D/GNP	0.77	1.58	1.95	2.33
Manufacturing Sector				
R&D expenditures	75.97	688.59	2,134.70	3,596.61
% of sales	0.50	1.51	1.96	2.62
Number of researchers (total) <sup>b</sup>	18,434	41,473	70,503	98,764
Government / public institutions	4,598	7,542	10,434	16,068
Universities	8,695	14,935	21,332	28,618
Private Sectors	5,141	18,996	38,737	54,078
R&D exp. / researcher (thousand won)	15,325	27,853	47,514	62,300
Researcher / 10,000 population	4.8	10.1	16.4	22.4
Number of corporate R&D centers	54	183	966	1,890

source: Ministry of Science and Technology, Korea

b: the figure donot include research assistants, technicians, and other supporting personel.

**TABLE-3****RELATIVE SHARE OF GNP AND EMPLOYMENT BY INDUSTRY FOR  
SELECTED YEARS**

Unit : per cent

Year	GNP			Employment		
	Agriculture, & Forestry & Fishery	Mining manufac- turing	SOC & Service	Agriculture, & Forestry & Fishery	Mining manufac- turing	SOC & Service
1961	38.7	15.4	45.9	-	-	-
1963	43.1	16.2	40.7	63.4	8.7	27.9
1973	26.7	22.3	51.0	50.4	14.3	35.3
1980	14.9	30.2	55.4	34.0	22.5	43.5
1990	8.7	29.7	61.6	18.3	27.3	54.5
1994	7.1	27.4	65.5	13.6	24.1	62.3

Source : Economic Planning Board, *Major Economics Indicators*,  
Various Issues.

**Table-4****Indicator of Human Resource Development in Korea's Student Enrolment 1953-1994**

	1953	1960	1970	1980	1990	1994
Literacy rate(%)	22.0	72.1	89.4	- <sup>a</sup>	- <sup>a</sup>	- <sup>a</sup>
Enrolment as a Percentage of the corresponding age group						
Elementary School (age 6-12)	59.6	86.2	102.8	101.0	100.7	100.5
Middle School (ages 12-14)	21.1	33.3	53.3	94.6	98.7	99.0
High School (ages 15-17)	12.4	19.9	29.3	68.5	68.9	88.7
College and Universities <sup>b</sup>	3.1	5.0	8.7	16.0	37.7	48.8
Graduates of Vocational training centers (1,000)	n.a	n.a	31.6	104.5	67.7	184.4
Number of graduates from tertiary schools (per 10,000 population)	n.a	18.8 <sup>c</sup>	36.9	103.7	258.0	311.8

a: Illiteracy rate after the mid-1970s was so insignificant that the government ceased to collect data on it.

b: The government controlled the quota for tertiary level schools. The demand for tertiary level education was far greater than the quota.

c: For 1960

**Table-5**

NUMBER OF SCHOOLS, STUDENTS AND TEACHERS : SELECTED YEARS 1960-

96

Items	1960	1970	1980	1996
<b>Elementary Schools</b>				
School	4,496	5,961	6,487	5,732
Students	3,662,685	5,749,301	5,658,002	3,800,540
Teachers	61,605	1,01,095	119,064	137,912
Ratio <sup>a</sup>	59.4	56.9	47.5	27.5
<b>Middle Schools</b>				
Schools	1,053	1608	2121	2705
Students	528,593	1,318,808	2,471,997	2,379,983
Teachers	13,053	31,207	54,858	99,928
Ratio <sup>a</sup>	40.5	42.3	45.1	23.8
<b>High Schools</b>				
Schools	640	889	1353	1856
Students	273,434	590,832	1,696,792	22,43,307
Teachers	9627	19,854	50,948	101,591
Ratio <sup>a</sup>	28.4	29.7	33.3	22.1
<b>Higher Education</b>				
Schools	85	168	236	849
Students	101,041	201,436	601,994	2,541,659
Teachers	3,808	10,435	20,900	63,809
Ratio <sup>a</sup>	26.5	19.3	28.8	39.8

Source :- Ministry of Education, ROK. Education in Korea (1996-1997)

a:-Average number of students per teacher.

(V)

**TABLE- 6**

**Technology Imports Vs R&D**

	1977-81	1982-86	1987-90
Tech. Imports	90.2	236.8	879.5
R&D	427.4	1195.8	4817.5
R&D/Tech. Imports (%)	21	20	18

Source : Ministry of Science and Technology.

**Table-7****RESEARCH AND DEVELOPMENT EXPENDITURES (1963-1980)**

(Unit: billion won)

	1963	1965	1970	1975	1980
<b>R&amp;D expenditures</b>	1.2	2.1	10.5	42.7	282.5
Government	-	1.9	9.2	30.3	180.0
Private Sector	-	0.2	1.3	12.3	102.5
Government vs. Private	97:03	90:10	88:12	71:29	64:36
<b>R&amp;D/GNP</b>	0.25	0.26	0.38	0.42	0.77
<b>Number of researchers (total)*</b>	n.a	2,135	5,628	1,027	18,434
Govt./Public Institution	n.a	1,671	2,458	3,086	4,598
Universities	n.a	352	2,011	4,534	8,695
Private Sectors	n.a	112	1,159	2,655	5,141
<b>R&amp;D Expenditures/ Researcher (Thousand won)</b>	n.a	967	1,874	4,152	15,325
<b>Research/1,000 Population</b>	n.a	0.07	0.17	0.29	0.48
<b>Number of Corporate R&amp;D Centers</b>	0	0	1 <sup>b</sup>	12	54

a: The figures don't include research assistance, technicians and other supporting personnel.

b: For 1971.



**TABLE- 8**  
**GROWTH RATES (%)**

	1961 <sup>a</sup>	1966	1972	1981	1987	1993
<b>Agriculture</b>	3.4	5.6	11.5	2.0	2.5	1.1
<b>Industry</b>	11.4	14.3	18.7	14.3	13.4	7.5
<b>Social Overhead</b>	14.4	18.3	20.9	14.2	10.4	10.5
<b>Services</b>	2.9	7.7	10.3	6.9	9.3	8.7
<b>GNP</b>	3.9	7.8	9.6	8.1	9.5	7.8

Note : average annual.

a : Growth rate from 1953.

Sources : National Income in Korea; 1978 and National Accounts 1994.

**Table 9****Strategies of Korean Economic Development Plans**

<b>Contents of Plans</b>	<b>Plan Targets</b>	<b>Rates of Planned(Actual) Economic Growth</b>	<b>Development Strategy (Policy)</b>	<b>Principles of Industrialization</b>
In Five-Year Plans (1962-66)	1. Correction of vicious circle of social and economic aspects. 2. Establishment of the foundation of a self-sustaining economy.	7.1 % (8.5 %)	1. Correction of structural imbalance in national economy caused by increase in agricultural productivity. 2. Securing of resources supply energy 3. Expansion of basic industry and sufficient supply of social overhead capital 4. Utilization of idle resources 5. Improvement of the balance of payments	Adjustment of the foundation of industrialization
2 <sup>nd</sup> Five-Year Plan (1967-71)	1. Modernization of industrial structure Acceleration of self-sustaining economy	7.0 % (9.7 %)	1. Self-sufficiency in food and development of water resources 2. Establishment of the foundation for rapid development of industries (chemical, iron and steel, and machinery) 3. \$ 700 million worth export performance and acceleration of import substitution-industries-improvement in the balance of payment 4. Increase of employment, expedite family planning measures and restrain population growth 5. Diversification of farming and increase in farm income 6. Promotion of science and management technology and increase in productivity	Outward-oriented industrialization
3 <sup>rd</sup> Five-Year Plan (1972-76)	1. Balanced growth stabilization and a balanced economy 2. Realisation of self-sustaining economic structure	8.6 % (10.1%)	1. Self-sufficiency in major food grains 2. Improvement of living standards in farming and fishery villages 3. Promotion of science and technology and development of manpower 4. Promotion of manufacturing through the build up of heavy and chemical industries 5. A balanced expansion of social overhead capital 6. Efficient development of national land resources and optimum dispersion of industries and population 7. Social security and promotion of national welfare.	The build-up of export oriented heavy and chemical industries

Cont'd...

Contents of Plans	Plan Targets	Rates of Planned (Actual) Economic Growth	Development Strategy (Policy)	Principles of Industrialization
4 <sup>th</sup> Five-Year Plan (1977-81)	<ol style="list-style-type: none"> <li>1. Growth, equity, and efficiency</li> <li>2. The creation of economic structure of self-sustaining growth</li> <li>3. Promotion of social development</li> <li>4. Technological innovation and raising of efficiency</li> </ol>	9.2% (5.5%)	<ol style="list-style-type: none"> <li>1. Self-reliance in investment financing</li> <li>2. An equilibrium in the balance of payment</li> <li>3. Change in industrial structure and rapid development thereof</li> <li>4. Expansion of Saemaul (new community) Movement</li> <li>5. Increased investment in science and technology</li> <li>6. Management of economy and system improvement</li> </ol>	Development of technological and skilled labour-intensive industries
5 <sup>th</sup> Five-Year Plan (1982-86)	<ol style="list-style-type: none"> <li>1. Stabilisation, efficiency, and balance</li> <li>2. Completion of the foundation of economic stabilisation</li> <li>3. Increase opportunity and income</li> <li>4. Promotion of nation welfare</li> </ol>	7.6% (8.6%)	<ol style="list-style-type: none"> <li>1. Price stabilization.</li> <li>2. Nurturing of comparative advantage industries</li> <li>3. Maximization of investment efficiency</li> <li>4. Promotion of market competition</li> <li>5. Acceleration of liberalisation or market-opening to foreign goods</li> <li>6. Resolution of management-labour disputes.</li> <li>7. Expansion of social development.</li> </ol>	To attain a stage of advanced industrialization
First 6 <sup>th</sup> Five-Year Plan (1987-91)	<ol style="list-style-type: none"> <li>1. Sustain Price Stability</li> <li>2. Promote Competition</li> <li>3. Improve equity of income distribution and enhance social welfare</li> <li>4. Ensure balanced development between regional and economic sectors</li> </ol>	7.3%	<ol style="list-style-type: none"> <li>1. Establish new free-market economic order based on autonomy, competition, and industrialization</li> <li>2. Base economic ethics on principles of equity and rationality</li> <li>3. Reduce central government regulatory functions to a minimum; transfer functions to private sector or local governments (privatisation, local autonomy)</li> <li>4. Government encouragement of plan and equipment investment in potentially high-growth manufacturing industries</li> <li>5. Accelerate development of small and medium-sized industries to bolster the industrial base</li> <li>6. Increase investment in science and technology development projects and education</li> </ol>	

Contents of Plans	Plan Targets	Rates of Plan ned(Actual) Economic Growth	Development Strategy (Policy)	Principles of Industrialization
First 6 <sup>th</sup> Five-Year Plan (1987-91)			<p>7. Adopt more rational, professional (less nepotistic) business management</p> <p>8. Government promotion of different regional economic blocs (in addition to Seoul) by strengthening ability of large local cities to serve as regional growth centres</p> <p>9. Develop small and medium-sized industrial estates in areas designated as agro-industrial districts</p> <p>10. Strengthen vocational training and lifelong education programs; bolster employment services</p> <p>11. Promotes workers' welfare</p> <p>12. Expand the middle class</p> <p>13. Sustain economic growth</p> <p>14. Expand the medical insurance system</p> <p>15. Develop a medium and long-term housing loan system for wage earners</p> <p>16. Institute a national pension system in 1988</p> <p>17. Improve Social well-being by strengthening traffic safety, food sanitation, and crime prevention, recreational and cultural activities</p>	Industrial diversification, balanced regional and sector development
Revised 6 <sup>th</sup> Five-Year Plan (1987-91)	<p>1. Sustain economic and control inflation</p> <p>2. Enhance economic equity</p> <p>3. Diversify the economic base</p> <p>4. Improve the quality of life</p> <p>5. Liberalize and internationalize the economy</p>	7.5%	<p>1. Tax reform; make system more progressive</p> <p>2. Curb real-estate speculation</p> <p>3. Grant greater autonomy to the financial market</p> <p>4. Promotes balanced development of large and small firms by facilitating fair competition and preventing concentration of economic power</p> <p>5. Establish cooperative and autonomous labour-management relations</p> <p>6. Accelerate and expand rural industrialisation</p> <p>7. Alleviate shortage of housing units for working people, especially in urban areas</p> <p>8. Increase government support for educating children for low-income families</p> <p>9. Control the balance of payments surplus</p>	Industrial Diversification, balanced regional and sectoral development, stimulation of small and medium-sized manufacturing and service firms

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Contents of Plans	Plan Targets	Rates of Plan ned(Actual) Economic Growth	Development Strategy (Policy)	Principles of Industrialization
Revised 6 <sup>th</sup> Five-Year Plan (1987-91)			10. Accelerate industrial restructuring and promot balanced growth of both the export and industrial sectors 11. Expand international competition and encourage overseainvestment, especially with socialist countries. 12. Establishing ground rules for a free market economy that generates equal opportunity and fair competition and stress autonomy and responsibility 13. Expand Public welfare programs and improve redistribution of income gradually so as to maintain economic stability 14. Open domestic markets to promote greater internationalization of the economy	

**Source :** First Five-5-year plans are from the federation of Korean industries, Korea's economic policies (1945-1985) (Seoul, FKI, 1987:6). Entries for the Two Sixth 5-year plans were abstracted from: Government of the Republic of Korea., The Sixth Five Year Economic and Social Development Plan 1987-91 (Second and Social Development Plan (1988-191) Soul, ROK: 1988, pps 9-16).