

**Could NEPAD Be Africa's Marshall Plan? Appraising  
Africa's Economic Recovery Initiative in a Comparative  
Perspective**

**By**

**M.H. Khalil Timamy, D.Phil**

**December, 2006**

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## Abstract

The aim of this paper is to cast a critical appraisal of Africa's Economic Recovery Initiatives since the Lagos Plan of Action launched in 1980. In devising the various blueprints, the authorities appear to have been motivated by the desire to catapult Africa to new heights of prosperous rejuvenation, this after years in which the economies have been wallowing in secular stagnation and worsening economic malaise.

The question that arises is whether NEPAD offers promising prospects for Africa to realize a process of economic renaissance. In this respect, the analysis hopes to address the following questions: Were the fundamental causes of Africa's economic downturn since the mid-1970s properly unearthed? What were the factors responsible for the eventual paralysis? Is the condition of *recession momentum* likely to be overturned in any profound way by the NEPAD proposals if they were implemented? How viable and robust is the recommended plan of action?

This paper is structured as follows. First, it discusses the notion of "recovery" in the context of the wider dynamic of economic change. Here, the neoclassical conceptualization of the phenomenon will be presented, followed by a description of a contrasting interpretation. Second, it examines the contents of the various strategies and the conceptual frameworks informing and shaping their fundamental outlooks respectively. Third, the paper analyzes some notable international experiences, and proceeds to show that the successful cases were guided by conceptual frameworks that forthrightly cast aside neoliberal principles, on the one hand, and actively integrated technological imperatives, on the other. Fourth, I reflect on the potential implications of NEPAD's neoliberal conditionalities on Africa's renewal prospects. Finally, the paper urges African policymakers to re-cast the entire NEPAD strategy in accordance with the demands for technological infusion.

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## **1.0 Introduction**

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## **2.0 Economic Recovery, Neoclassical Orthodoxy, and the Technological Imperative**

But, what makes economies grow? What is the driving force behind any growth? Are investments key to economic renewal? Or is there something else that growth strategists and governments need to pay particular attention to?

## 2.1 The notion of economic recovery

Market-based economies tend to experience a natural recurrence of economic crises and depressions. The process is wavelike in character. The ebbs and flows of economic activity are systematically generated by such economies in the course of their evolution.

In other words, the alternations between prosperity and recession are a result of the economies' own internal dynamics. When the times are good, the demand for goods and services increase, stimulating employment. At the same time, applications for new loans lead to greater investment injections into the economy. Interest rates rise, profits increase, and demand for higher wages grow. The environment is gripped by an epidemic of optimism.

Each wave has the tendency to produce another wave. The waves are a product of forces within an economy, each phase of the cycle systematically producing the next. Wesley Mitchell puts it in the following vein:

“An incipient revival of activity, for example, develops into full prosperity, prosperity gradually breeds a crisis, the crisis merges into depression, depression becomes deeper for a while, but ultimately engenders a fresh revival of activity, which is the beginning of another cycle.”<sup>1</sup>

The notion of cyclical fluctuations suggests regularity of activity, which, of course, is not the case. The fluctuations vary in intensity and duration. Some fluctuations are protracted in time, lasting 50 years. These are referred to as the Secular Cycles. But within these Kondratiev waves, fluctuations spanning 10 years are also in operation. These are the Decennial cycles. And within the decennials are even smaller fluctuations called the Cyclettes. These have a span of 3 years.

Now, early neoclassical economists argued that fluctuations were temporary and transient departures from equilibrium, and that sooner rather than later, the economy would gravitate towards order and stability once again. Therefore, economists like Lionel Robbins of London School of Economics and Joseph Schumpeter of Harvard advocated a hands-off approach to dealing with depressions and downturns generally. They believed that depressed economies would automatically pick up again. The best policy, according to them, is not to intervene; the downswings should be allowed to run their course.<sup>2</sup>

But the post-war era witnessed a shift in neoclassical emphasis. Economies gripped by crisis were urged to embrace a series of measures that came to constitute the standard prescription of the Bretton Woods institutions. These will be discussed later under structural adjustment programmes. What is crucial to bear in mind is that the kind of crises bedeviling African economies do not fall neatly within the model described above. Most African regimes have, by and large, become pear-shaped because of the sheer recklessness of, and economic misgovernance by, the political leaderships. Whatever the

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<sup>1</sup> Wesley Mitchell (1913) *Business Cycles*, Burt Franklin, New York.

<sup>2</sup> See Galbraith, J.K. (1987), *A History of Economics*, Hamish Hamilton, United Kingdom.

causes of the prolonged ebb in economic activity in Africa, the need to re-activate the pear-shaped economies has received considerable attention over the last 30 years. The question that arises is whether the recovery blueprints have embodied strategic measures capable of initiating a process of sustainable economic renewal in the region.

## **2.2 Technological imperatives and conceptual preconditions for recovery and take-off**

No recovery can ever be expected to be deep and dynamically sustainable without the entrenchment of technological preconditions. This is what economic history tells us. Rostow's (1955) work heightened the significance of technological change in stimulating growth-oriented dynamism in an economy. Although his analysis can generally be faulted for imprecision, it nevertheless sheds insightful light on the strategic role of technology in catalyzing an economic take-off. He observed that the preconditions for take-off (what we would regard as preparing the ground for initiating a recovery) were, among other things, rooted in applications of new discoveries and inventions, on the one hand, and changes in values and orientations, on the other. In addition to significant investments in social overheads (e.g. transport), Rostow emphasized the importance of another technological underpinning, namely, phenomenal increases in productivity stemming from technological revolutions in agriculture.

During the take-off stage itself (what we would, for our purpose, regard as the renewal process), not only did he emphasize the need to inject high levels of investments (5% - 10% of GDP), but also underscored the imperative to develop one or two leading sectors capable of fuelling a process of dynamic and synergistic resurgence. It is here that the technological underpinnings of Rostow's model become evident. In his analysis of the *primary growth sectors*, he suggested a focus on those domains with inordinate *prospects for innovations*. These, he observed, should generate growth rates surpassing anything in the wider economy. This technological feature of the primary growth sector would be responsible for triggering rapid growth in the *supplementary growth* sectors. In other words, the leading sector, given its technological vivacity, would have a ripple effect on other sectors through productivity-increasing transformations. Clearly, Rostow placed a special premium on the technological factor in the take-off of economies gripped by economic inertia.

Another vital factor key to facilitating economic take-off rests on the emergence of a *governing elite* imbued with results-oriented paradigmatic framework, values, and an orientation conducive to spearheading progressive economic change. Armed with a correct worldview rooted in reality and nourished by the springs of experience, the leaders pursue courses of action that inspire people to embrace technological modernization.

Now, this point is worth belaboring because many African countries have, in recent years, witnessed the rise of a new crop of well-meaning and progress-desiring leaders who have, unfortunately been guided by a paradigmatic framework too obsolete and

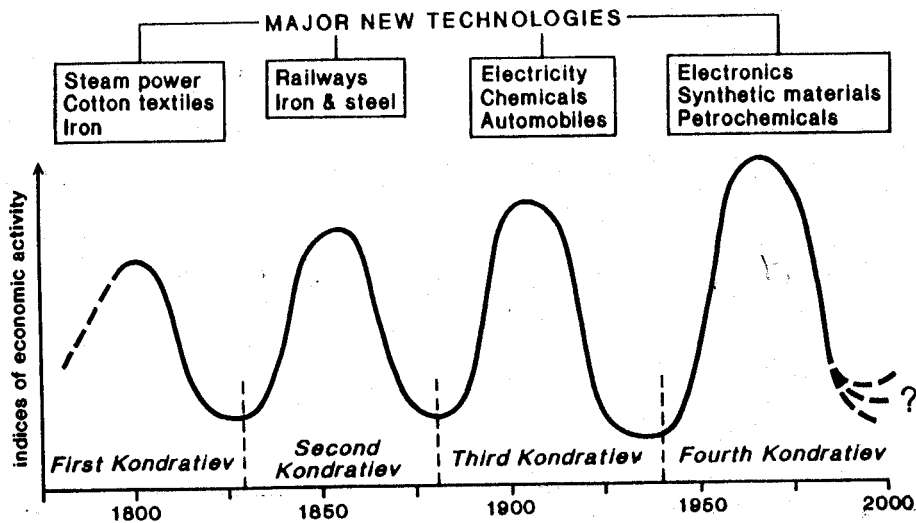
simplistic in its conceptualization of the science-technology relationship. Their enthusiasm to initiate processes of recovery and renewal has been blunted by a narrow cognitive outlook. The ramifications of a flawed cognitive orientation will be taken up in the last section.

### 3.0 Technology and the pursuit of economic growth

Evidence from history shows that periods of significant economic resurgence and renewal were underpinned by major innovational experiences and the evolution of requisite technological capabilities. Schumpeter associated major bursts in economic activity with the disequilibrating effects of technological change. Therefore, the role of technology in the economic renaissance of stricken nations cannot be overemphasized.

From a path-breaking study by Abramovitz (1956) and Solow (1957) on the U.S. economy, it emerged that new capital investments accounted for only 18% increase in production. So, where did the other 82% increase in output come from? The researchers concluded that the disproportionately large growth in output stemmed from technology -- increased proficiency and skill of workers, technical changes (shifting to better techniques), minor innovations at the shop-floor level, institutional and organizational improvements, etc. Their evidence cast the technological factor into sharp relief.

**Figure 1 Technological innovations and economic resurgence**



**Source:** Dicken, P. (1992) *Global Shift*, Paul Chapman Publishing Ltd, London.

Wonderstruck and enthralled by the marvels of techno-industrial change, developing countries in their eagerness to model themselves according to IC's, cultivated a belief that technology transfer from the north was an important condition of development. Access to modern technology was a crucial prerequisite for development. Gee (1981) makes the following point:

"Foreign countries remember the miracles of technologically based industrial innovation in the United States dating back to the Industrial Revolution and have witnessed the major role that American technology played in the economic resources of West Germany and Japan since World War Two. These industrial lessons have not been listed on them but have since found expression in their determined efforts to adapt imported technology to local needs. The developing countries in particular realise that, in order to reap the full benefits of an increasingly technological world, they must align their governmental infrastructure for effective utilization of technology imported mainly from the industrialized countries."<sup>3</sup>

Faith in technological change expressed in the policy objectives of developing countries was thus strengthened as a result of its influence on the growth patterns of industrialized countries.

The continuous creation of new science and technology, and the accumulation of knowledge in general, has been seen as a positive development largely because this accumulation is deemed to favour newcomers.<sup>4</sup>

The point was not lost when more than 50 per cent of economic growth of IC's was realized to have stemmed from technological changes, the latter being identified as a major determinant of economic development.

After this basic recognition, many developing countries expressed optimism and went about setting up institutions to obtain technology from industrialized countries. The declaration made by the United Nations proclaiming the 1960's as the first Development Decade gave greater urgency to Africa's ambition of facilitating technological, industrial and economic development. This realization also placed some responsibility on the IC's to help initiate a faster development process in the south. By the end of that decade, little progress had been made on its vital score, despite futile efforts by developing countries to secure agreement from IC's on the crucial question of International Code of Conduct for the Transfer of Technology to the South. The technology issue was brought up in the discussions on the

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<sup>3</sup> See Gee, S. (1981) *Technology Transfer Innovation and International Competitiveness*, John Wiley and Sons, Inc., New York, pp.103-104.

<sup>4</sup> Hans Singer is not convinced that the accumulation of science and technology in the North presents any great advantages and benefits to latecomers. He contends that "... it is because of the accumulation of science and technology, or rather the specific nature of this accumulation, that we witness much widespread failures of real development among the latecomers, belying the unthinking optimism of earlier days". Singer raises two principle objections. One, a large part of the simple accumulation of science and technology in the North is unlikely to benefit the South mainly because the knowledge is idiosyncratic and distinctively unique to the problems, circumstances, factor endowments, and requirements of the North. Two, there is a continuous process of displacement of previous knowledge as new science and technology are created. The submergence of this knowledge when new innovative changes are introduced implies that it is displacement rather than accumulation that takes place. What also needs to be added is that a large part of this knowledge is protected by patents and forms intellectual property rights, and is therefore not freely obtainable. The high cost of technology has slowed down the South's industrialization process. For an elaboration of Singers view on the transfer of technology. See Singer, H. (1975) "Science and Technology for Poor Countries" reprinted in G. Meier (1976) *Ibid.*, p.395-397.

New International Economic Order in 1974, after developing countries felt that the global economic system an independent development of their economies. The thrust of the challenge stemmed from the recognition that an exploitative relationship characterized economic relations between the North and the South that worked to the considerable disadvantage of the south.

International inequities, particularly those related to trade and technology transfer, were reflected in the magnitude of resource outflows from the South mainly generated from royalty payments, transfer pricing, market control, restrictive business, monopolistic abuses, duty exemptions, capital repatriation allowances and favourable terms of trade for the North. On general terms, a large part of research and development expenditure, about 98 per cent was, and continues to be invested, by industrialized countries. For the majority of African countries, interest payments for matured debts were well in excess of 50 per cent of export earnings, sparing only a modicum. Driven by sombre predictions of impending economic malaise, many developing countries launched a drive to redress the global economic system towards greater social and economic justice. In the wake of the OPEC oil embargo of 1973, and the new found power of oil exporters, the developing countries put forward a series of demands that would, among other things, involve an equitable framework for questions of technology transfer, industrialization market access of industrialized countries, debt, and Aid. Despite the inauguration of two crucial environmental conferences in the early seventies, the broad issues of discussion on technology and industrialization during the decade hardly addressed the fundamental questions of ecology in the technological capabilities in the Third World.

Why is it that, despite overwhelming and decades-long evidence underlining the primacy of technology to economic growth, governments in Africa have consistently failed to *embody* this factor as an integral part of their development processes and recovery strategies? This state of affairs is baffling, if not shocking, to say the least. Yet, it can be explained. Africa's development planning activities have largely been dominated by technocrats of neoclassical persuasion whose conceptualization of technological change is simplistic, restrictive, and narrow. For all practical and policy purposes, their understanding of this variable i.e. strategic driving force of all economic systems, is superficial. In this respect, the disproportionate influence that the neoclassical economists have traditionally exerted on Africa's economic affairs has translated into the inexorable relegation of technology into the periphery of development concerns. It is therefore not entirely surprising to witness the persistent marginalization of this factor in one recovery blueprint after another.

#### **4.0 NEPAD, Neoliberal Conditionalities, and Recovery Prospects**

In view of the fact that privatisation and liberalization constitute among the core pillars of the donors regime of conditionalities, the question that arises is whether the prevailing global system offers any promising prospects for Africa to realize an economic



renaissance early this Millennium and, in particular, whether the NEPAD framework, in its present constitution, embodies the dynamic gems vital for activating Africa's deliverance. At the outset, Africa's immediate challenge is cast in terms of the massive resource gap (US\$64 billion annually) that the NEPAD implementers have to grapple with, and how foreign capital injections, largely expected to flow in the form of Direct Foreign Investment (the latter deemed as vitally significant in realizing NEPAD's goals), could be accelerated appreciably. This way, I am able to contextualize the critical discussion on neoliberal projects (privatization, liberalization and globalization), the former underpinned by the Output-Based Approach (OBA) potentially inimical to Africa's technological prospects.

Unfortunately, though NEPAD has been seen as an indigenous African creation, it has turned out to be a scheme already domesticated by the G-8 countries to serve the broader covert objectives of organized spoliation. By all conceptual indications, NEPAD has been programmed to fail. The ideological forces of neoliberal fundamentalism have made it abundantly clear that their support for the NEPAD project would only be forthcoming if Africa fulfils the free market conditionalities endorsed at Monterrey, Mexico, in March 2002. Apparently, the neoliberal reforms would be technologically harmful and strategically inimical to Africa's prospects for dynamic economic evolution.

## **5.0 Global experiences**

A cursory glance of economic history shows that market-based economies have experienced major fluctuations in the course of their economic evolution. To stem the tide of recessionary or depressionary conditions obtaining in their systems, different countries devised recovery measures in the process. Let us look at some notable international experiences in this regard.

### **5.1 The Great Depression and recovery experiences**

Germany emerged from the Depression through proactive policies and interventionist mechanisms. Its plans placed considerable emphasis on heavy industries and motor vehicles, these biases driven by clear-cut targets such as achieving mass consumption and self-sufficiency. To realize the latter, Germany was to be guided by a specific technological imperative, namely, the need to *produce substitutes* for imports. This technological challenge was directed to textile fibers, iron ore, rubber, non-ferrous metals, and essential foodstuffs.<sup>5</sup>

Germany succeeded in its recovery efforts for two reasons: one, it had developed credible plans underpinned by clearly defined technological considerations, and two, it put its money where its technological mouth was. By mid-1930s, major strides had been made. Heaton (1933) notes:

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<sup>5</sup> Heaton, H. (1933) *Economic History of Europe*, Harper and Brothers Publishers, New York, U.S., p.712.

“*New plants* appeared to produce synthetic rubber and gasoline, to make wool substitutes from straw and fish albumen, to work low-grade domestic ores, and even to squeeze oil from grape pips.”<sup>6</sup>

Britain’s revival during this period was also influenced by technological considerations, including the stimulus from the mass consumption effect. *Modifications* and *improvements* in railroads, as well as *developments* in the electrical supply sector, were stimulated by significant injections of capital investments whose flows stemmed from the operation of a low interest rate regime. A combination of selective public sector measures and fiscal policies created conducive conditions for technological change. Heaton (1933) observes:

“About a quarter of the new investment in capital went into housing. The tariff guarded the home market for some industries and *gave birth to some new ones*, including a large crop of American branch factories.”<sup>7</sup>

The mass consumption situation and the industries linked to it were maintained through investments in social services, provision of unemployment benefits, and the construction of roads. These initiatives went a long way in utilizing domestic technological capabilities.

## 5.2 The Case of Japan

Since 1991, Japan has been in the thick of a severe economic downturn. Recession has hit the country three times in the last decade. In 1997, the government made the mistake of smothering promising recovery prospects when it imposed a neoliberal austerity measure, namely, a tight fiscal policy.<sup>8</sup> In 2000, the nascent growth prospects were frustrated following the implementation of a tight monetary policy that raised interest rates. Japan has since pursued a zero interest rate policy, and has expressed readiness to actively intervene in the exchange rate market to manage an orderly relationship between the Yen and the U.S Dollar.

Another feature of Japan’s recovery plan is that it has slowed down the reform process, in particular, its bid to cut its huge fiscal deficit.

Integral to the anti-neoliberal measures cited above are a whole raft of technological initiatives which are meant to underpin the recovery drive. Japan’s seeks to capitalize on innovations in the sphere of mobile phones which she hopes to improve and refine. Moreover, greater and closer links are being forged between R & D institutions and production to enhance the country’s manufacturing base and local participation.<sup>9</sup> And thirdly, her recovery programme is underpinned by manufacturing exports for highly

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<sup>6</sup> Ibid, Heaton, 1933, p.712

<sup>7</sup> Ibid, Heaton, 1933, p.705, emphasis mine.

<sup>8</sup> See *The Guardian Weekly* “Tokyo know-how is the way to grow”, December 11<sup>th</sup>–17<sup>th</sup>, 2003, Vol. 169, No 25, p.12.

<sup>9</sup> Ibid, p.12.

competitive technological innovations such as the hybrid car that combines petrol and electricity.<sup>10</sup>

### 5.3 The Marshall Plan and Europe's Recovery

When the U.S. went out of its way to help re-build a war-ravaged Europe through the Marshall Plan, *the neoclassical approach was deemed irrelevant. Indeed, the blueprint suggested explicitly that the free-market principles should not apply during the execution phase.* It proposed that

“... a temporary suspension ... be made of the principles of the liberal world economy...”<sup>11</sup>

Also worth emphasizing is the huge role played by technology in Europe's post-war regeneration.

“The United States was the largest seller of patents and licenses-to-produce. About half of the total amount of technology which French, British, West German, Italian, Japanese, and Canadian companies *imported through patents and licenses* was of American origin.”<sup>12</sup>

Note above the instruments used to effect technological change. During Europe's recovery phase, the process of re-industrialization was underpinned by technologization. This particular aspect of the recovery initiative was reinforced by U.S. flows of foreign direct investments, a process that not only witnessed the transfer of know-how, management techniques, and technology, but also “...helped to *close the technological gap* between the United States and Europe.”<sup>13</sup>

The Plan identified the following imperatives as strategic: infrastructural modernization, phenomenal production increases of energy and steel, equitable geographical distribution of heavy industries, optimal and coordinated balancing of agricultural and manufacturing activities, and monetary and financial stability. All these objectives were pursued within the purview of principles other than those supposedly underlying the operations of a liberal world economy.<sup>14</sup>

## 6.0 Technology Policy and Technology-led Recovery

If technology is such a strategic variable in initiating and promoting dynamic economic change, then technology policy would represent that package of measures necessary to institutionalize and deepen processes of technologization in an economy. Technologization means increasing and expanding the knowledge base of an economy by building and utilizing domestic technological capabilities. A wide range of technological capabilities have been identified, of which the following are most important:

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<sup>10</sup> Ibid, p.12..

<sup>11</sup> See Van Der Wee, H. (1986) *Prosperity and Upheaval*, Penguin Books (English Translation), London, U.K., p. 353.

<sup>12</sup> Ibid, p. 211, emphasis mine.

<sup>13</sup> Ibid, p. 213, emphasis mine.

<sup>14</sup> Ibid, p. 353.

- Production capability – refers to knowledge, skills, and experience to operate, repair, maintain, and manage a production facility.
- Investment capability – refers to knowledge, skills, and experience to replicate a production facility
- Innovation capability – refers to the knowledge, skills, and experience to improve and modify a production facility
- Linkage capability
- Marketing capability

Now, the overriding function of technology policy is not only to enhance an economy's potential to build domestic technological capabilities where relevant and appropriate, but also maximize the utilization of those capabilities. The more proactive and more consciously applied the technology policy framework is, the greater the economy's potential to promote the above ends. Technically, then, technology policy could be defined as the deliberate and discretionary manipulation of a government's budgetary and other resources (human, regulatory, etc.) to influence the rate and direction of technological change in an economy. In simple terms, technological change refers to the shift in the frontiers of an economy's practical knowledge base. The knowledge considered here is one with proven application, not the type represented by non-commercialized inventions and scientific discoveries.

A robust technology policy regime would, of necessity, not only seek to expand domestic employment opportunities, but also tend to reduce the rate of unemployment. The whole thrust of the policy to maximize the utilization of local capabilities is aimed at achieving that prospect. At the same time, a technology policy framework seeks to promote foreign investments that maximize the utilization of domestic resources and inputs, on the one hand, and minimize technological dependence, on the other. This way, an economy's participatory potential is increased through domestic content specifications and local subcontracting requirements.

Clearly, a robust technology policy regime would be decisively instrumental to a recovery strategy in view of its growth-generating, employment-increasing, and empowerment-enhancing potential. An economy's wealth-creating capacity would thus become a matter of course, all else being equal.

Therefore, when a country's recovery strategy is said to be technology-led, it means that the policymakers are being guided by a robust technology policy framework in the course of pursuing their development aspirations. A science-led programme, on the other hand, seeks to realize economic change by placing greater emphasis on science policy. This refers to the deliberate but discretionary manipulation of a government's budgetary and other resources to influence the rate and direction of inventiveness in an economy. Most industrialized countries registered impressive economic achievements through technology policy systems rather than science policy regimes. Many still retain strong technology policies, though for some, science policy has assumed increasing prominence and has grown in influence over the last 50 years. United States and Britain are cases in point. The U.S. government, for example, heavily funds basic scientific research through

its specialized federal agencies to generate inventions and develop new technologies reflecting public needs in areas such as energy, national defence, space exploration, high performance computing, communications, biotechnology, advanced materials, advanced manufacturing, environment, and public health.<sup>15</sup> It also uses legislative and enforcement policy instruments to influence the private sector develop technologies in certain areas of interest e.g. environmentally sound technologies.<sup>16</sup> Clearly, the U.S. has treated science policy and technology policy as complementary. The objective of pursuing such a mixture stems from the realization that technological progress is crucial to achieving higher levels of economic performance, and that this could come about by improving and upgrading the country's technological capabilities.<sup>17</sup> But in times of national emergency (1973 and during the Depression), the Federal Government intervened strongly with technology policy to "galvanize capabilities".

## 7.0 Which Way Forward?

The reforms demanded by the G-8 countries are of the type advanced by the World Bank (the Private Sector Development Strategy) and the WTO (liberalization and globalization) which, as we have already seen from the forgoing discussions, pose grave risks to Africa's potential to realize robust technological change. Moreover, while the G-8 countries have used coercive measures to prize open African economies, they have paradoxically, reciprocated by sustaining highly subsidized regimes that have readily undermined Africa's export potential, on the one hand, and adversely damaged local African industries following reckless dumping practices they set in motion, on the other. The disastrous techno-economic consequences unleashed on the highly competitive sugar industries in Mozambique and South Africa by EU's subsidized economies are a case in point; so too has been the fate of Kenya's milk industry.

If the unassailability of the damning evidence furnished in the earlier chapters is anything to go by, then the reform measures, which the G-8 countries are demanding to see implemented by African governments as a condition for securing their partnership, have all the ingredients of subverting the technological potentiality of a NEPAD-based economic change. In this regard, Africa would be well advised to reject the technologically-constraining demands called for by the ideological forces of neoliberal fundamentalism.

Current efforts by NEPAD to forge a framework that would assist African countries, integrate science and technology into development processes have lacked depth. The NEPAD ministerial conference on science and technology held in Johannesburg between 3-7 November 2003 addressed issues that were bereft of fundamental and critical components. For example, the draft plan of action was not only rudimentary in substance but also failed to provide policy makers with concrete ideas on how African economies can effectively integrate science and technology into development. In fact, the term "integration" has been poorly understood by leaders in Africa. No attempt has ever been

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<sup>15</sup> UNESCWA (1999) *Science and Technology Policies in the 21<sup>st</sup> Century*, United Nations Economic and Social Commission of Western Asia, New York, p.114.

<sup>16</sup> Ibid, p.114.

<sup>17</sup> Ibid, p.113.

made by NEPAD to address this. Yet, the drive to integrate S &T should be at the very centre of efforts to rejuvenate African economies.

In truth, what does “integration of S & T” really mean? Most policymakers tend to convey the impression that their regimes have, in fact, been pursuing integration. For instance, they would cite the formation of *science and technology ministries* as one case in point. Further, they would state that African governments have enacted legislation establishing *S &T Acts*, another demonstration, they would say, of attempts at integration. In addition, they would cite the creation of numerous *public R&D institutes* as evidence of this. And last but not the least, they would note that the *innovations introduced in the educational curriculum to reflect increased technical orientation and greater emphasis on science subjects* are a clear manifestation that African countries have been integrating science and technology into development.

The above range of initiatives, pointed out by African leaders, are powerful arguments by any stretch of the imagination. They are, in their own right, very significant, and it would be foolhardy to dismiss them as superficial. Yet, the question that arises is why Africa has not, from such efforts at S&T integration, been able to realize dynamic economic change. In other words, if African policymakers believe that that they have been integrating S&T into development, how come the fruits of that integration are few and far between?

Undoubtedly, the reasons for this failure are too numerous to exhaust here, but suffice it to say that African’s national systems of S&T are not underpinned by the active and conscious application of science and technology policies. Most African countries lack national science and technology systems with capacities to actively and consciously build and strengthen domestic science and technological capabilities.

I would define science policy as the deliberate but discretionary manipulation of government budgetary and other resources to influence the rate and direction of inventiveness in an economy. In the same vein, technology policy refers to the deliberate but discretionary manipulation of government budgetary and other resources to influence the rate and direction of innovation and technological change in an economy. A country’s national system of science and technology would thus be manipulated to spur inventions and innovations.

Central to this integrative process is the organic fusion of development planning with technology planning. Over the years, Africa has equated development planning with, and treated it as synonymous to economic planning, and because Africa’s planning institutions have invariably been dominated and manned by neoclassical economists, technology was given short shift as a result.

Technology planning has been one of the most neglected areas of Africa’s development experience, Leaders need to establish technology-planning departments as a matter of urgency. These should not only be located at the development planning ministries, but should also be linked to economic planning units.

As part of the active and conscious application of technology policy, the technology planning department should be responsible for setting technological targets as well as achieving requirements stipulated in areas such as domestic content, subcontracting, standardization and so on.

A technology planning unit need also provide a range of technological incentives designed to promote techno-economic change. The following measures could be instrumental in enhancing Africa's prospects for realizing sustainable economic renewal.

Clearly, the proposed interventions enumerated above run counter to the prescriptive mandates of neoliberal fundamentalism.

### **Conclusion**

This paper is premised on the view that technology is the driving force of all economic systems. It took deliberate steps to reveal the distinction between technology and investments, and proceeded to argue that, while investments are necessary to spur economic recovery, they are instrumentally insufficient. Dynamic investments will be those that increase domestic linkages, enhance local participation and utilization of domestic technological capabilities, promote domestic sub-contracting and standardization, and so on. Therefore, the issues of technological change and domestic technologization should be at the very heart of any conceptual framework that is expected to inform and guide a strategy of economic recovery.

This appraisal has attempted to show that, all else being equal, economic recovery strategies underpinned by technological imperatives have a far greater chance of success than would otherwise be the case. The paper has discussed the experiences of Europe (the Marshall Plan), Japan (long-drawn out recession since 1991) and Japan to underscore the instrumentality of technological dimensions as the foundational basis for initiating dynamic economic recovery. In contrast, it has demonstrated the strategic futility of recovery initiatives generally underpinned by overarching neoliberal conditionalities which, for all practical purposes, treat technology as *incidental* and not *integral* to processes of economic change. The distinction in the two approaches made here is meant to highlight the need for policymakers to underpin their recovery strategies with the right kind of conceptualization if their depressed economies are to entertain any realistic hopes of experiencing sustainable rejuvenation.

It should be understood that the strategic embodiment of technological imperatives per se in a recovery scheme would not automatically pre-ordain an economic renewal. Other vital prerequisites would need to be in place such as effective leadership, macroeconomic stability, sound infrastructure, and so on. What is being advanced here is that the prospects for economic growth and recovery would be very dim indeed if all the economy's favourable prerequisites are predicated on a neoliberal paradigm rather than on technological dimensions.