

*Review*

## Theory of Ethnic Innovation Policy

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**Ethnic innovation policy is an unwritten technology innovation policy operating in the social sphere. Such innovation policy lies with the people and can be located in their culture. That is, its actors operate mainly from the sociocultural dimensions as opposed to the political dimensions. An attempt to achieve full and self-sustaining technological innovation system in political states with marked ethnic divisions yields a phenomenon I have termed ethnic innovation policy. It is ubiquitous and resides, as it were, in the culture through collective identity reconstruction. It is an innovation policy ubiquitously authored by a people with a common ethno-religious identity. This paper is a conceptual framework on the notion of ethnic innovation policy.**

Keywords: ethnic ownership of technology, ethnic technology identity-competition, ethnic markets, ethnic technological nationalism, ethnicization of technology.

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### INTRODUCTION

It is ethnic formations that built the world's technologies and transformed European states, North America, and Japan into industrial and subsequently postmodern states. Africa unfortunately, having been beleaguered and misshapen by colonialism, is bedeviled with ethnic pluralism as against the ethnic homogeneity and cohesion enjoyed by the aforementioned states that are now at the stage of postmodernism in their technological histories. Ethno-religious homogeneity therefore is the singular and most powerful observable factor that runs through the technological histories of the most advanced countries of the world.

Two factors are implicitly salient here:

- mass participation in technology production and consumption,
- democratization of technology production.

Mass participation in technology production and consumption and the democratization of technology production cannot be achieved without an explicitly high degree of ethnic cohesion or better still ethno-religious homogeneity. The dismembering or segregation of one ethnic group from another and the parochial enlistment of members of diverse ethnic groups into the same political state and the centralization of power in those states by European colonialists left African states crippled and technologically impotent. Our contention from STS-Political Science lens is that this is a premeditated move by European colonizers (both British and French) to keep their colonial states perpetually periphery states and to maintain themselves as the metropolitan centres from whence technological artefacts and technological knowhow may diffuse. They deliberately deprived Black African people colonized by them of the most fertile soil for technological takeoff and sustained growth, which is ethno-religious homogeneity and cohesion, by craftily tampering with the natural ethno-religious

delineations of the various ethnic-nations.

However the way forward is not to continue to berate the British and their allies but to intelligently reinvent ethno-religious consciousness and apply same to drive technological takeoff in those African and Third World states where nationhood was a forced phenomenon and has remained turbulent till date. For example all African states created by Britain fall within this category.

What philosophy of technology is implicit in ethnic innovation policy? Obviously its technology philosophy is technophilia or love of technology (Drengson, 1982). At this stage economic and psycho-social pressures drive the ethnic identity to invest in technological know-how and technology business ventures as the ethnic formation seeks power and freedom from poverty and disease. Technophilia has been identified as the first stage in the evolution of technology wherein the total absence of technological power has created a strong hunger and subsequently strong love of technology. At the ethnic innovation policy stage, technology must be had at whatever cost and for whatever sacrifice. Ethnic innovation policy therein plays the necessary role of galvanizing the ethnic society to achieve technological takeoff, or in my parlance, to achieve technological arrival. Ethnic innovation policy then doubles as

- a reactionary response to the stimulating power of ethnic competition on technological development in multiethnic political states,
- a solution to the problem of technological takeoff in underdeveloped states burdened with ethno-religious pluralism.

### **Ethnic innovation policy as a theoretical construct: diverse ramifications**

Ethnic innovation policy is a sociopolitical theory of technological development classifiable as Science and Technology Studies research. STS-based theories of development are essentially innovative theories of development since they tackle the most critical factor of any development paradigm, namely technological development. Being innovative theories they are pragmatic and proactive development manuals the common man in an underdeveloped state can understand, contribute to, and engage with.

The theory of ethnic innovation policy is a redefinition of technological nationalism. Ethnic innovation policy essentially redefines

technological nationalism by conceptualizing nationalism as fundamentally ethnic nationalism. The state is perceived as the centre but the ethnic-nation is the engine room of this technological nationalism. It strips the concept of technological nationalism of its garments and reassembles this superstructure element of state politics on its rudimentary skeletal frame, namely the ethnic nationalities in a political state and their technological engagements. The genetic components of a people – their genetic history – manifest as their bloodline, their character, their temperaments, their technological temper and savvy, in a word their identity.

*Ethnic innovation theory* is the foundational construct of ethnic innovation policy. Ethnic innovation policy then is the cultural implementation of ethnic innovation theory. It is the knowledge construct upon which ethnic innovation policy construct is built. Indeed both are constructs, but ethnic innovation theory is the primary construct from which depends ethnic innovation policy as the secondary construct.

Our argument in ethnic innovation policy-cum-theory is that technology is first ethnic, then religious. Ethno-religious forces therefore determine the success or failure of technological innovators. The establishment of technology is ethnic and not national. You can say it is national if the country is a homogenous one, an ethnic-group state, an ethnic group which has evolved to political state. Such a country is a nation-state. The role or law of ethnic homogeneity is clear here. Ethnicity is the determinant of technological innovation where it has not been established. Where technology production is yet to take off, ethnicity and religion are two most important factors that determine its establishment, its takeoff. It is the atmosphere of ethnic homogeneity that catalyzes technological takeoff. Technological innovation thrives with the least opposition in an atmosphere of ethnic and religious homogeneity. Technology then has enemy-forces, and one of the enemy-forces of technology especially at the formative takeoff stage is ethnic heterogeneity, ethnic pluralism. Ethnic homogeneity on the other hand is technology's mother. This is the social atmosphere where technology is hatched after incubation. Technology incubates and hatches in the atmosphere of ethnic and religious homogeneity. The right atmosphere for technology to hatch is ethnic homogeneity. This is the right atmosphere for technology to be created, to be established for the first time, for technological takeoff to be achieved.

So in developing countries, in Third World countries, in Fourth World countries, in very poor countries that are technologically dependent, you look for the factor of ethnicity. If such a country has ethnic homogeneity, then that country has everything it takes to hatch technological takeoff. *The central idea in the notion of ethnic innovation theory and policy is that technology production culture hatches easily in an atmosphere of ethno-religious homogeneity.* The First World countries, the super-industrial countries which are today's postindustrial states all enjoyed ethnic homogeneity, ethno-religious homogeneity indeed, that easily translated to the successful incubation of technology-producing societies.

The United States is an exception on the surface to the principle of ethnic homogeneity but qualifies on the grounds of religious homogeneity. The United States is a country that was established by European immigrants whose native countries had already achieved serious milestones in science and technology and who then carried their technological culture and ability with them to their new country. The ability to travel from Europe to America required a high level of technology relative to the era to master the seas. The mass movement of people from Europe to America from 1600 onwards (Wikipedia) implies that shipbuilding and navigation technologies had already been mastered by the Europeans. The various ethnic groups of Europe represented as various ethnic-nation states had already achieved technological takeoff which enabled them to put ship at sea to successfully transport their citizens to the Americas. The Europeans who settled in the United States and Canada already had a going technology culture in their native countries. Technology had already taken off in Europe which enabled them to reach North America and establish there. And in North America they continued in the selfsame technology tradition. One can say that there has been ethnic homogeneity in the United States for instance in the sense that the European settlers were administered by Britain as 13 Colonies to which they bequeathed the English Language. The English Language became the language of all Europeans in the 13 Colonies and the language of the African slaves who joined later on from the 1600s. The British, the French, the Italians, with Christianity as their common backgrounds, did not see themselves as different because they now spoke one language being the English Language.

Ethnic identity reconstruction occurred on a massive scale among the European settlers to produce the American identity. The American

identity of technology and freedom captured the imagination of the respective European ethnic settlers. The ethnic identity of Americans in the first 100 years of settlement in that country from the time of its discovery can be described as European-English or English-European – a homogenous ethnic identity created by the universal adoption of an alternate identity while still retaining their collective Christian religious identity. The arrival of Black Africans as slaves from the West African coast 200 years on speeded up the identity-reconstruction of different European ethnicities into Whites as different from the Blacks or Negroes. Identity construction and reconstruction continued into the beginning of the 20th Century and left us with two dominant ethnic groups remaining – the White Americans and the Black Americans, with Christianity as the common denominator.

### **Theoretical Assumptions Embedded in Ethnic Innovation Policy**

Ethnic innovation policy arises in political systems where the right sociopolitical atmosphere for technological innovation does not occur naturally. It arises when the hitherto suppressed inventor in such political environments begins to acquire the right consciousness of who he is. The maker of technology needs not to go through the frustrating experience of working with government persons who do not like him because he is not from the same ethnic group or of the same religion as them. The following introduces the theoretical assumptions implicit in ethnic innovation policy.

#### **1. Ethnic Ownership of Technology**

A car is not just a car or a technological creation – a car is an ethnic product. A car is an expression of ethnic identity. The survival of technological inventions and the achievement of technological arrival (technological takeoff) in Third World countries must be centred around the notion of ethnic ownership of technology, especially where ethno-religious divisions are powerful. A technological artefact created by a member of a specific ethnic group builds itself into the identity of that ethnic group. We describe this level of identity as ethnic technology-identity or ethnic technoscience-identity. This demonstrates the perpetuity of identity reconstruction of ethnic nationalities. *Ethnic inventors then are powerful instruments in the identity reconstruction process*

*of their own ethnic formations.* Ethnic formations continually evolve in their image-identities. Identity reconstruction then is the evolutionary process of creating and recreating the image-identity of the ethnic group. Ethnic technology-identity operates at the ethnic-ego level which defines the ethnic image-identity. When the ethnic image-identity becomes technological, that ethnic group has reached the point of no return known as the takeoff where it can be described as a technological system which gathers momentum. At this stage too ethnic competition between the in-group and the out-group has moved from image-identity competition to competence competition and competence manifestation in the technological sphere. In such a society the ethnics begin to mill around their scientists and inventors; then they begin to find ways to engage with their inventors and technological entrepreneurs which irrevocably produces domestic technology business narratives. Economic interests form around local technological inventiveness to create in the ethnics technological self-confidence. Technological self-confidence then becomes a cultural force that can demolish any hurdles in its path, whether such hurdles be political or ethno-religious. Social technology epistemologies and paradigms capable of initiating competence competition among contending ethnicities in a political state are invaluable in Third World countries struggling with ethnic and religious antagonisms such as abound in Black Africa.

One way to express this theoretical framework is to describe technology as an ethnic child. Technology is a tribal phenomenon. In democratic societies it is ethnic identities that give birth to technology. Technology is a tribal or ethnic manifestation. As an ethnic child, it is not simple at all for different tribes in a political state to come together to pursue a technological agenda especially at its takeoff stage, as propounded in national systems of innovation. It is even more difficult for different ethnic groups across different political states to come together to achieve technological takeoff such as propounded by continental/regional systems of innovation. Ethnic homogeneity drives technological innovation. Technological innovation in homogenous states such as Japan and Western European states is driven by the principles of ethnic innovation policy.

In the following analysis we draw extensively on the Igbo ethnic group in Nigeria as a shining example from Africa. The most critical part of any technology manifesto is the takeoff stage, in our parlance the stage of technological arrival. Technological arrival in our definition is the

attainment of basic feats in mechanical engineering, which would include the manufacturing of machine tools and machine parts and the parts of basic combustion or electromechanical engines. This is the foundation of automobile technology which easily expands into the full mechanization of agriculture in heavy industry manufacturing. From here the electrical, biological, and chemical technologies get their critical mass of domestic impetus.

Wherever technology develops to the point of arrival, wherever technology acquires the takeoff momentum, it is the personal efforts of a specific ethnic group that achieves the feat. Ethnic groups then form and grow technology. Technology is an ethnic child. A specific ethnic group gives birth to it, breastfeeds and nurtures it. Technology in any environment goes through the natural human processes of conception, gestation, parturition, infancy (with toddling as a very important learning stage), childhood, adolescence, and adulthood. An ethnic group gives birth to a piece of technology and becomes its natural parents. When parents give birth to a baby the baby is not given to another woman to breastfeed and nurse; the infant is not taken out of the hands of the mother as soon as she gives birth to it. The infant is not taken from the mother by any natural process and given to another woman to breastfeed and nurse while the mother looks on, probably to relieve the mother of responsibility, for this would be unnatural. The father and mother naturally want to be responsible for the life of their child. Ninety-nine percent of what obtains is that when a woman gives birth she carries her baby and tends it with utmost care. If the father is around he brings resources for the upkeep of the baby. Both father and mother enjoy caring for their baby because it came into the world through them and belongs to them.

That is how technology is. Those who give birth to technology become the natural mother and father of same and are responsible for its survival into adulthood. The parents of a piece of technology are responsible for its life and upbringing. If it falls into another hand it may not die but it will surely lose its identity and its true history will be lost. The parents of a piece of technology are responsible for its life because they are the people who have the greatest attachment to it, for the parents of the child see themselves in the child. Just like the parents of a child, the makers of a piece of technology would do anything to protect the technology from counterforces, from its enemies.

A technology's ethnic group is the mother of the

technology-child. The mother at a time may send the child to pre-nursery school at a very early age when the child is still trying to control his own toileting. Eventually the child graduates to nursery school. The pampering and tending continue at this stage until finally the child begins to bathe and wear his school clothes all by himself. With time the child completes primary school and enters secondary school. The mother is still there to see that the child lacks nothing as far as her means can afford. The mother does her very best to pay her child's school fees and procures the child's books as required by the school and becomes restless when these requirements are not met. The good mother is tied to her children in providing for their welfare more than anyone else in the world. The truth is that the mother is the first owner of the child before the father. The mother takes the greatest risk and reaches the greatest extent in providing for the child.

The ethnic group of a piece of technology is the mother-of-the-child to that technology. Consider a motherless child especially in backward countries like Nigeria where the government does not value its children. The child in this environment takes whatever fate it finds if the father is not available or if the father's hands are tied in a poor polygamous home. In the same vein the Igbos of southeast Nigeria are mother-of-the-child to certain technological artefacts. No one but the Igbos is capable of raising their children with the same amount of passion and dedication as the Igbos have for them. Igbo technological capabilities and milestones are children of the Igbos and for this reason it is the Igbos that must raise them. The Igbos are the mother of their technological inventions. The Igbos must give their technology-babies everything it takes to turn out rotund, well-fed children that are the delight of every parent. The technology-children of the Igbos will change the destiny of their parents permanently for good. The Igbos therefore must value their technology-children. The attention they give to their technology-children will positively affect their development into a superpower race. Children so raised with attention grow up to give their best to their parents.

Technology is the child of the ethnic group that produced it. The maker or creator of the technology or the *technology-idea* belongs to an ethnic group which is the mother ethnic group of that specific technology-child. In the Igbo language this statement can be expressed as "Aburu na-eweputa teknoloji. Aburu na-azukwa tekoloji." Technological inventiveness in specific ethnicities and by natural and spiritual law must

be nourished by the specific ethnicity that produced it. Otherwise it would amount to a rejection of the inventor who is a gift to that ethnic identity. The technology creator was born in the specific ethnicity to first uplift that group and subsequently other groups. The least the emergence of an ethnic technology achieves is to drive into that group's collective consciousness the fact that it runs in their blood to invent technological artefacts and that therefore inventor A is not alone as there could be inventors B to Z who must be found and owned by that group. This is the origin of technological self-confidence.

The Igbos are known across the world for their remarkable technological acumen that is unparalleled in Africa. Unfortunately these Black Africans are unaware of their mother-role as a people. The Igbos seem not to care about their technology-companies, their technology-entrepreneurs, their technology-inventors existing in their ethnic homeland. What are the Igbos doing with the technology-businesses their members have successfully established within their homeland? The problem lies in the Igbos' misconception of these technology-businesses as any other privately-owned business enterprises in the Igbo ethnic homeland. But this is wrong. The technology-town of Nnewi for instance is littered with hundreds of technology-businesses. The significance of these technological enterprises from STS purview is that they are flagship firms for technological takeoff awaiting collective sociopolitical action. The Igbos by their nonchalant attitude to their flagship companies are toying with their indigenous Silicon Valleys.

The technology-businesses in the Igbo homeland must be taken by the Igbos as their collective responsibility. They are technology capability flagship projects which the Igbos must feed with finance, attention, market, planned expansion, et cetera because technological capability of the said technology-businesses is the property and pride of the home ethnic identity group. The ethnic identity group becomes the owner-ethnic group and therefore the mother-ethnic group and must be personalized by this mother-group. In ethnic innovation policy, the Igbos must feed and nourish their technological capabilities manifesting as technology-businesses owned by their people within their geographical terrain. These businesses will grow up to wipe out poverty and unemployment from among them and finally establish the reality of technological independence of the people. By this anecdote then, the episteme of technological independence can be pursued as ethnic-nation agendas and not

only as political state agendas.

The foregoing principle is not peculiar to the Igbos but applies to any ethnicity as a component of a political state. Technology worldwide is an ethnic phenomenon. It is an ethnic child. It comes from – it is an indigene of – an ethnic group. Each technology is the child of an ethnic group, and the inventor-ethnic groups in the history of science and technology have had special attachment to their technology-children. The ethnic group that gives birth to a piece of technology or successfully initiates a technological capability is the very ethnic group ordained by God to look after that technology. The owner-group must nourish it until, like your natural child, it grows up and begins to look after himself and thereon begins to look after you the owner.

African tribes must own and nourish the technological capabilities (even imitation capabilities) that God gave them until they grow up and mature. Upon maturity they are ready for harvesting. In the hands of technology lie political power, economic power, and social connections. In its hands upon maturity are everything the owner-group may desire. Technology gives these powers to the owner-group without reservation.

Technology is as fundamental in the social sphere as labour unions are in democratic societies. Ethnic technologies can be organized in the order and criticality of labour movements. The misconception among African tribes is that technology is such a political or governmental thing which leaves the common man with little or no responsibility. The truth is that the quest for technology is such a tribal thing, such a social thing, and such a cultural thing. Historically, the German tribe for instance has always pursued technology with such passion to ensure that they will always be technologically superior to the rest of European tribes. The British tribe on their own has always worked hard to ensure that, if they do not lead, at least they cannot be seen to be technologically inferior to the Germans. Every European tribe has at least written its identity on a motorcar. The European tribes incidentally have the good fortune of being political states in themselves. African tribes were not so fortunate. Herein lies the need for this ethnic-technology education to be thoroughly domesticated in African and Third World tribes. Every African or Third World tribe that is up to 10 million people can write its name on a car. Every African or Third World tribe can fix up its identity-car and drive it. Technology is an ethnic thing, an ethnic effort, an ethnic agenda. In the future, ethnic groups that fail to create a technology-identity for themselves will

be like lost languages. Ethnic innovation policy then is produced when ethnic pride finds technological expression. Personally I do not want to belong to an ethnic group with no technological handwriting.

National efforts across Africa at achieving technological takeoff have yielded next to nothing and billions of dollars have gone down the drains because the campaigns – that is the technological takeoff programmes – were not ethnically owned, controlled, and directed. Their governments failed largely because there has not been a clear understanding of the notion of ethnic ownership of technology, which itself is a notion embedded in ethnic innovation policy. These massive national failures also translate to supranational failures as in the failed efforts of ECOWAS, NEPAD, the AU and others at achieving technological takeoff (technological arrival) of African countries over several decades.

### **Ethnic Technoscience Identity-Competition**

Identity-competition presupposes the existence of identity-thwarting by one group against another. When the identity of one ethnic group rises in significance it can cause a diminishing of the identity of a neighbouring ethnic group. Apart from calculated campaigns at thwarting the identity of rival or neighbouring ethnic groups, identity enrichment of a proximate ethnic group can cause a disquiet and unrest in the other ethnic group which is a manifestation of a thwarted identity. This is an indirect thwarting because it is not confrontational and can be seen as an unintended consequence of identity enrichment.

Across ethnic-nation states the phenomenon can be produced by nationalism of one sort or the other, but within a heterogeneous country this ethnic competition effect is produced by ethnocentrism. Both nationalism and ethnocentrism are identity reconstruction and “identity thickening” (Hale, 2002) paradigms. When an ethnic group entangled in image-identity competition with a rival group makes a technological success, it quickly absorbs that technological success into its image-identity in its identity reconstruction and enrichment process. The present situation diminishes the image-identity of the rival ethnic group which feels so thwarted and proceeds to work to find a technological success it can initiate to attach to its own image-identity. Thus ethnic technoscience identity-competition is born in the rival ethnicities, and this has its roots in the psychological drive for

competence manifestation and competence assertion. This psychological drive, in addition to those of relatedness and autonomy, are well expounded by Deci and Ryan (2008) in their famous treatise on self-determination theory (SDT). Competence image manifestation is very important for ethnic collectives especially among those in the same political state. At its roots are ethnocentrism and ethnic pride. These psychosocial elements find full expression in ethnic technoscience identity-competition wherein ethnic identity technological artefacts are created and become the parameters or measure of ethnic competition. The embeddedness of identity technological artefacts in ethnocentrism therein becomes critically salient, wherein countless arguments could be produced to capture ethnocentrism as an indispensable process in the social production of technology. Therefore technological latecomers such as Iran, which incidentally is an ethnic-nation state, are only manifesting their technological competence need-drive in view of the achievements of their ethnic relatives, chief of which in this case is Israel. In the same vein, the nuclear arms race of the defunct Cold War is viewed in ethnic innovation policy as a competence competition paradigm. The need and drive for countries to feel technologically competent and self-determined creates a competence manifestation urgency which finds expression in demonstration of mastery in nuclear technology. Ethnic identities as political states build up nuclear technology for electricity development first, and subsequently acquire nuclear weapons technology and build nuclear armaments to satisfy their intense need for competence manifestation in the difficult and complex science of nuclear technology, while deploying the political narratives of national security and defence as important and acceptable political rationalization which makes their achievement worthy of note among the comity of nations. This also satisfies the other two needs of relatedness and autonomy in SDT.

The technology-child is the positive identity of the mother ethnic group. No ethnic group would want its positive identity to be stolen or transferred to another group. Ethnic groups technically do not cooperate to produce technological milestones. This is because technological innovations come from ethnic formations and are owned by them. Technological innovations then generate image-identities for their owner ethnic identities who respectively do not wish to share the glory of their image-identities with anyone, especially when such image-identities become technological.

Within this notion too, ethnic identities become more discriminatory and 'racist' as their image-identities get more and more technological.

### **Anecdotes in Ethnic Innovation Policy**

Diverse other narratives and elements become visible when technological innovation is viewed through the purview of the theory of ethnic innovation policy.

### **Ethnic Convergence on Technology Leaders**

Ethnic technology leaders of Africa and the Third World should rise up and mobilize their ethnic group formations for collective action on their science and technology possibilities. Ethnic technology leaders should undertake public education on their ethnic science and technology action programmes and agendas. Ethnic technology leaders must undertake to set such ethnic technology targets. Radio programmes, television programmes and documentaries, books and magazines, seminars and workshops are the communication channels. There will be investors, sponsors and facilitators of the ethnic mobilization project. According to Emeagwali, "The inventor is the first teacher of his invention." The inventor must see himself as a high-powered ethnic leader and must begin to create high curiosity for his invention among his ethnic enclave and most of the time in his native language. No matter how educated or 'Westernized' the ethnic inventor may be, it is important that he is able to fathom the power of his own voice in his native language in the communication of the ethnic invention via radio or television. The point here is that the more the ethnic inventor can speak his language the better the impact on creating the required high voltage of ethnic passion around his invention. Conversion or elimination of the present crop of African politicians (whose major achievement since the attainment of political independence of their countries is the crippling or outright truncation of the technological development of their countries) begins here. African ethnic publics must begin to see survival, which is more than hope, in their technology leaders. Survival through their technology leaders must be perceived with mathematical precision by ethnic publics through mass enlightenment. The power-shifting process will then begin. Political power in Africa will at this point begin to shift away from the 'politician' as we know them to the new group identified herein as

technology leaders as the new protagonists in Africa's ethnic democratic politics.

### **Ethnic Branding**

Ethnic branding is acutely relevant in ethnic innovation policy as a powerful tool for achieving ethnic technological excellence. In social psychology ethnic branding is an invaluable tool in ethnic mobilization of any kind. The salience of ethnic branding in ethnic innovation policy subsists insofar as there is technological content in such branding. In absence of technological content or focus ethnic branding becomes a purely propagandist mechanism for achieving political agendas set by the political and religious elite which are usually destructive and aimed at merely the acquisition and perpetuation of political power. This form of branding may be completely unconnected to the present realities of the group.

Because words carry images which imprint themselves on the human mind, they create disquiet in the consciousness of the out-group. More powerful branding tools such as pictures and videos can create such tension several times faster than words. They trigger the alarm system of the out-group which in turn triggers the emergency hormone of the group and then a defence mechanism initiates the process of ethnic identity-competition.

Ethnic science fiction (Nwosu, 2018) then becomes an excellent tool among other tools in ethnic branding paradigms. In ethnic science fiction mere silence about the out-group, that is the non-recognition of the out-group in a science fiction rendering is interpreted by the related out-group as implicit or tacit thwarting which motivates the said out-group to the generation of its own ethnic science fiction as countermeasures. A firework of countermeasures by each stakeholder ethnic group in the image-identity competition follows. These countermeasures are first perceived as competence competition in themselves, but certain social dynamics will produce this 'war' in the technological playing field as an extension of the *virtual world* competence competition initiated by the countermeasures.

### **Ethnicization of Technology**

In ethnic innovation policy, the ethnicization of technology is the creation of the cultural foundations of technology. Politics without a science and technology focus creates a muddling

effect in the life of the country as exemplified by nearly all African countries from their political independence till date. Our observations are from the viewpoint of a political scientist with STS orientation.

When Africans 'ethnicize' their politics they create such phenomenon as "advanced cases of stayism" or, at their best, ethnic democracy (which itself is basically hegemonic democracy that achieves ethnic power balancing and not the democracy of issues) which is quite expensive, unproductive, and diversionary. (The diversionary quality of ethnic democracy lies in its ability to draw the attention of African countries away from its principal agenda which is how to catch up technologically with the rest of the world. Ethnic democracy renders African countries as the thorn-eating camel which gets its tongue and mouth cut and its blood mixes with the food it is eating. The camel finds eating painful but must however eat since it does not know how to chew thorns without producing bleeding cuts in its mouth). The best playing field for ethnicization is the technological innovation field. By this we do not refer to the ethnicization of governmental structures for science and technology development which usually translates to the struggle by the different ethnicities for the mere siting of technology project structures in their ethnic enclaves, whether they are productive at the end or not and whether the implicit value-chain is realized or not. By the ethnicization of technology innovation we mean the discriminatory promotion of and identification with technology innovation achieved by members of the in-group as opposed to those of the out-group.

### **Ethnic Markets in Ethnic Innovation Policy**

An ethnic market exists for every ethnic technology innovation. Ethnic indoctrination states that it is ethnically correct to buy any product made by your ethnic group insofar as the product serves your purpose. Patriotism is a euphemism deployed by Western scholars to describe this ethnic propensity and to hide its true composing elements. The roots of patriotism lie in ethnicity. It is ethnic indoctrination that made every conceivable technological innovation have a serious domestic market which gives the innovation its first impetus.

Two components implicit in ethnic markets are ethnic audience and ethnic investors. In Nwosu's work (Ethnic Construction of Technology, this volume), an attempt is made to construct and

expound the notion of ethnic markets. Ethnic markets arise as a natural consequence of programmed communication to the ethnic publics about the technological innovation achieved by the in-group, wherein ethnocentrism and ethnic pride are invoked. The first element then of the ethnic market of a technological innovation is the well-articulated and sensitized ethnic audience. Once the right quantity of ethnic audience is created for the ethnic technological innovation, ethnic investors emerge as a natural consequence of this mobilization. It is ethnic investors that can take the innovation to its other stages, up to the mass-production and mass-consumption stage, engaging with political hurdles with brevity.

### **Technological Sparks in Ethnic Innovation Policy**

Ethnic leaders should always be on the lookout for technological sparks among them. Technological sparks are *emergenic* individuals whose technological potentials become technology ignition points for the ethnic group. Such individuals could represent a large technological system or an entire scientific revolution achieved by that group such as turnkey inventions that can spark off massive and rapid technological innovations by several other members of the group. Such emergenic individuals are well distributed among the ethnicities of the world. A good number of them are born to each ethnic-nation at least in a generation. Some ethnic groups out of their own carelessness have had their own emergenic individuals stolen by other ethnic groups. For example the Igbo ethnic group has had a good number of its emergenic individuals stolen by or lost to certain Western ethnic groups. We use the extreme terms *stolen* or *lost* because of the extreme nature of the problem. The indigenous owners of these individuals cannot under any arrangement recover their geniuses and super-geniuses in one piece. There seems to be an unknown conspiracy for a one-way traffic of Africa's geniuses and super-geniuses out of the continent. Just ten of these minds are enough to transform the crippled continent into a massive technological powerhouse. Thomas Edisons keep reincarnating and the Creator of the Universe did not exclude Africa from being their home.

Some technological sparks then are essentially technological explosions capable of closing some 100 or 200 years of the technology gap between

Africa and say the United States. Yet ethnic leaders have allowed these special people to be captured by other countries without first harvesting some of their potentials for the uplifting of their ethnic-nations. These emergenic individuals do not get the privilege of the freedom of football stars who may return to their native countries to play for them during international sports competitions. One wonders what form of citizenship contracts Africa's technological geniuses sign to the utter detriment of their ethnic-nations and the entire African continent. Yet they are not properly celebrated and honoured in their adopted countries as ethnic nationalism in those countries works against them. The loss of Africa's technological geniuses to the developed world through the conventional brain drain mechanisms is exactly what ethnic innovation policy stands to terminate. Cultural ownership, investment, and development of technology sparks impede easy penetration of foreign powers with their wholesale immigration packages and the attendant brain loss. In ethnic innovation policy the emergenic individual or technological spark becomes the property, the child, of the ethnic-nation which accords him the sociopolitical, economic, and cultural resources he ever needs for his full development. This is possible because at this stage technological innovation has moved "out of the laboratory and into the culture".

### **Authors and Actors of Ethnic Innovation Policy**

Ethnic leaders and ethnic organizations involved in promoting ethnic technological innovation become de facto authors of ethnic innovation policy. Certain individuals and organizations naturally emerge by virtue of education, exposure, and experience to promote science and technology consciousness as part of the ethnic awareness of their group. Ethnic consciousness is not just for the struggle for the control of political power. Ethnic leaders and certain ethnic organizations may emerge to expand ethnic consciousness to include ethnic technological assertiveness, ethnic technological breakthroughs, and ethnic technological leadership in their articulation of ethnic consciousness. These individuals may be at the leadership of ethnic cultural organizations or may hold some form of political office and carry out their ethnic technology awareness campaigns through leadership by example. Therefore the authors also constitute the actors of ethnic

innovation policy. The other actors then emerge as a consequence of influence by the authors. Ethnic leaders and ethnic-leader organizations in one scenario form authors of ethnic innovation policy as they are the first to articulate thought-orientations for ethnic innovation policy. In another scenario, ethnic business interests through marked entrepreneurial drive develop technology-innovation start-ups leveraging on some form of technological self-awareness of the ethnic collective. Usually, such start-ups are owned by individuals and organizations who have previously succeeded at a non-technology start-up enterprise and subsequently take a leap into the untried terrain wherein they could become pathfinders. Once an individual or a business organization succeeds in setting off the technology start-up, the other members of the ethnic collective will begin to pursue technology start-up businesses in large numbers. The impact of one successful story is more on the members of the specific ethnic collective than across ethnic identities due to certain obvious reasons. For one thing, members of the same ethnic group feel equal to each other since they perceive themselves to be related at some primordial level. So, company A feels it can make inroad into, say, auto parts manufacturing which company B has successfully achieved. This may be described as the ethnic origins of industrial clusters. It also explains why certain ethnic identities are known for certain crafts which in the end are described as cultural identities of those ethnic collectives. The primordial-ethnicity effect therein produces industrial enterprises that become cultural legacies of the specific ethnic-identity group. In this second scenario then, actors of ethnic innovation policy are the very authors thereof since through trial and error and accidental discovery they produce thought-actions for ethnic innovation policy.

### **Ethnic Technological Nationalism as Ethnic Innovation Policy**

Ethnic innovation policy manifests as ethnic technological nationalism. Atomistic thinking and propensity are personal survival instincts. But ethnic pride propels collective thinking and action. Ethnic pride must be fanned up to drive 'big thinking' in the ethnic collective (Unknown author, 2006). Ethnic pride is required to plant big thinking in the ethnic collective. It is not only when personal survival (that is atomistic thinking and action) is achieved or satiated that ethnic pride can take preeminence. Both propensities can run

concurrently in the members of the ethnic collective. Ethnic pride as a collective drive cannot be satiated to any satisfactory degree without some form of technological engagement. Whether as mastery of technological processes, technological imitation, or technological inventiveness, ethnic pride finds technological engagement as its ultimate playing field.

Technological nationalism carried out in multiethnic or mono-ethnic countries are essentially top-to-bottom programmes carried out by a particular governmental regime seeking political popularity or propelled by ethnic leaders of a dominant ethnic group which is also in control of political power. Such a technological nationalism is not endemic because it is not owned by the entire people and therefore difficult to get into the culture. Technological nationalism of the top-to-bottom order however can succeed in authoritarian states and governments such as the defunct Union of Soviet Socialist Republics (USSR) and the Chinese Soviet Republic (CSR). Enduring technological nationalism succeeds in democratic states whether mono-ethnic or multiethnic in the pattern of ethnic technological nationalism which is a bottom-to-top pattern. In mono-ethnic states it is driven by the quest to achieve a technological nationhood as an ethnic identity as compared with rival ethnic-group countries, so that the pattern of ethnic competition becomes interstate. This is the pattern of technological nationalism in most of Europe and the Far East, except China which achieved technological takeoff through its technological nationalism under authoritarian regimes.

In multiethnic states, ethnic technological nationalism is driven by the quest to achieve a technological self-identity by rival ethnic groups in an atmosphere of ethnic identity-competition, so that the pattern of ethnic competition is intrastate. Ethnic technological nationalism is then located in the culture as it is completely owned by the relevant ethnic-identity group. In multiethnic political states this pattern propagates and replicates itself in spite of the government. Autogenic and self-sustaining, it is neither initiated nor promoted by the national government but may be supported by relevant ethnic state or provincial government.

The distinction then between technological nationalism and ethnic technological nationalism lies in their respective drivers. While the former is driven by the central or national government (such as the technological nationalism of the command government of the defunct USSR), the latter is driven by cultural forces and as such is not

susceptible to regime change. Technological nationalism therefore is inferior to and less desirable than ethnic technological nationalism. Ethnic technological nationalism then is a manifestation of ethnic innovation policy. Ethnic innovation policy itself is the invisible force, the unseen prime mover, of ethnic technological nationalism. Ethnic innovation policy is the summary of cultural forces that propel ethnic technological nationalism. As the atmosphere of ethnic technological nationalism, ethnic innovation policy can accurately be described as the ultimate secret of technological takeoff and technological independence. It is the universal recipe for technological takeoff.

## CONCLUSION

In the permutations of ethnic innovation theory, the soldier in the poor world cannot be proud to call the gun he carries his own because it is not made by his people. This gun is his power but his power then is unreal because it is not truly given to him by his people; it is not even made by an ethnic or racial relative. This artefact gives him so much power, yet he feels unconnected to it. The soldier finds no pride in carrying a gun his country or ethnic or racial relative did not in any way contribute to its manufacture. The Third World soldier's power therefore is not real power because there is an emptiness of pride behind the gun artefact.

Inventor awareness runs high in epistemes of ethnic innovation policy. High awareness or consciousness of ethnic inventors and innovators becomes an indigenous narrative which deepens the domestication of science awareness/consciousness movement. Operationalizing the theory of ethnic innovation policy can best be construed as a science demystification project rooted in the social sphere.

Science demystification paradigms are themselves technological independence projects. The advantage point of ethnic innovation policy over other demystification epistemologies is that it is powered by the social sphere in the form of ethnic identities rather than the governmental administration whose vision may be curtailed by political forces beyond its range of control.

Furthermore, political-governmental administrations in Africa and the Third World are bedeviled with an incurable propensity for mindless stealing of public funds and the general abuse of power. Ethnic identities as social forces however are stable and reliable as powerhouses for constructing technology demystification and technological independence action as anecdotes of ethnic innovation policy.

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