VIEWS OF PERIPHERY OF ICT AND DEVELOPMENT PERSPECTIVES FROM CANADA TO AFRICA[1]

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INTRODUCTION

Traditionally, the development of communications has been closely linked to the formation and development of empires. Harold Innis was a pioneer in pointing out those relationships in his classic work "Empire and Communications". Hence an approach in the studies of the role of information and communication technology in development is "geopolitics of communications" (Innis 1950; cf. Bakis 1987).[2]

The creation of modern communications (canals, railways, steamships, submarine cables, radio telegraphy) since 1850 was a precondition for the building of the worldwide British Empire and the spread of Western colonialism around the globe. Symbolical expressions like "annihilation of space and time" were used in this context (Headrick 1991; Hills 2002).

The rising American Empire overtook the dominant position of the British Empire in international communications after the World War 1939–45. The American war effort which continued since the beginning of the Cold War produced new technologies (transistors, computers, satellites) and new theories (information theory, cybernetics, operation analysis). In addition, modern mass communications studies (newspaper, magazines, TV, movies) as well as advertisement and marketing studies gained impetus there. Hence USA became a new world centre of communication studies (Dahan & Pestre 2004).

But the USA became also a world centre of ideologies, utopias and myths related to modern communication technologies. They were considered as

[1] This is a revised version of the paper presented in the 11th EADI General Conference "Insecurity and Development. Regional Issues and Policies for an Independent World" Bonn 21–24 September 2005, the EADI Working Group on Science and Technology for Development.

[2] I have distinguished the approaches in the study as follows: 1) evolutionist-modernization-diffusion one; 2) geopolitics; 3) political economy; 4) phenomenological 5) Keynesian-reformist and 6) technical system dynamics.

"technologies of freedom" and constant innovations created new revolutions, eras, societies and economies (Carey & Quirk 1970, 1973).

When new microprocessor and digital technology started spreading from California in the 1970s, when oil prices were high, the international economy was in crisis and the rise of the so-called new industrialized countries from Asia and Latin America put pressure on traditional industrial sectors in the USA, Western Europe and Japan, political and economic leaders there saw new information technology as the saviour of their dominant economic and political position in the world. Consequently, a necessary shift to "information society" due to "information revolution" was taking place in the USA, Western Europe and Japan (OECD 1979, 1980, Godet & Ruyssen 1980).

The new critical concept of "new international division labour" meant, for its part, that Western and Japanese multinationals started shifting production to low-wage countries in the South in order to cut down production costs and to improve profits. Cheap transport (sea, air) and telecommunication costs (satellites, new cables) facilitated such a shift (Fröbel, Heinrichs, Kreye 1977, Schneider 1994).

But the discussion of new information and communication technology and, in particular, that of the role of ICT in development has not been an American and Western monopoly. Critical discussion has taken place in the peripheries of the American continent in Canada and Latin America. This is the main topic of this paper but some attention will also been paid to the discussion in India, Iran and, in particular, to Africa where a discussion has taken place of the role of "oral communication".

I have collected materials on ICT and development during my studies, work and visits to different parts of the world since the late 1970 and my first article on the issue stems from 1980. I do not, however, pretend that my knowledge of sources is perfect, it is highly selective and there are also evident gaps. But to realize an international comparative study which would pay attention to critical views from the peripheries is not an easy task (Raumolin 1980).[3]

AMERICAN PERIPHERIES

Canada

The staple approach as presented by Harold Innis in his studies of the impact of the fur trade, fishing, wheat production, mining and pulp and paper industry on the development of Canada stressed the importance of geography, history,

[3] I have tried to get funding for the international comparative and historical study for a book emphasizing pluralism and diversity on the basis of a lengthy manuscript but have not been successful cf. Raumolin 2002a.

institutions and technology in the study of the development based on the exports of natural-resource-based commodities. He also emphasized "centre-margin" and "metropole-hinterland" relations in the exploitation of natural resources in the periphery. The fur trade, fishing and wheat production linked Canada to Great Britain whereas mining and the pulp and paper industry oriented Canada towards the USA (Innis 1956).

His view was that communication technology plays a crucial role in history. It has a great impact on forms of social organization. Breakthroughs in technology, such as the invention of printing, led to social transformations, and the struggle for control of new means of communication. Communication technology affected culture by altering the structure of interests and by changing the character of symbols as well as the nature of community (Innis 1950, 1951; cf. Carey 1975).[4]

Innis emphasized the importance of space- and time-dimension of means of communication. "Durable means of communication" which were difficult to transport, such as parchment, clay and stone, are "time-biased" while "light and less durable means" like papyrus and paper are "spatially-biased." "Spatially-biased civilizations" are prone to expansion as well as to build large empires. They are also characterized by secular political authorities. Modern Western civilization is a typical spatially-biased one and expansionist and, consequently, unstable.

Innis set a contrast between a civilization based on "oral communication" and that based on "written communication". Typical of the former was communal and collective life as well magic and religion whereas the latter was more individual and materialistic. The civilization based on written communication was hostile vis-à-vis the oral civilization and did its best to impose its views everywhere. Innis used the notion of "monopoly of knowledge" in this context.

A proper balance in space and time dimension as well as in oral and written traditions was necessary in order to achieve a stable society. This combination was, however, very difficult to achieve. Innis saw ancient Greece as an example of such a society.

Harold Innis was free from the typical Western idea according to which progress in communication technology signifies progress in society and culture. He even started the introduction of his book "Empire and Communications" by referring to the work of four well-known representatives of the cyclical interpretation of history: Spengler, Toynbee, Kroeber and Sorokin.

Innis used the notion of "double bind" as he analysed the post-war relations between the USA and Canada. The United States imported the raw material for

[4] The American communication theorist James Carey has been one the best interpreters of the work of Harold Innis and kept this tradition alive cf. Carey 1989.

printing industry from Canada, by stressing the international division of labour, comparative advantage, and free trade. It then exported back to Canada the printed products like books, newspapers and magazines as well as advertisements. Those exports were defended by the free trade doctrine and the doctrine of freedom of information.

It is a kind of paradox that Marshall McLuhan became the heir to Innis in Canadian communication studies in the 1960s. He was not interested in social institutions but he adopted an evolutionist view according to which technical means are extensions of man. Then, he claimed that the individual senses are basic to communication. On this basis, he claimed that printing encourages private and individual points of view. Television, which is a new electrical way of organizing experience, was destroying the civilization based on print. Hence, he stressed a conflict between generations and relativism of moral and values (McLuhan 1962, 1964; cf. Carey 1967).

McLuhan adopted ideas from the neo-evolutionist visionaries, in particular, from the French Catholic palaeontologist Pierre Teilhard de Chardin who used the notion of "noosphere" to indicate the new sphere created by science and technology on the globe. He adopted revolutionary notions, and wrote enthusiastically of the advancement of new ages. He also liked modernity by participating in performances and TV programmes. Consequently, he became a prophet of a "new age of information" and was very popular, in particular, in the United States (Teilhard de Chardin 1955, 1956; McLuhan & Fiore 1968).

In the 1970s, Canadian scholars started finding out anew about the work of Innis after it was realized that the ideas of unilinear modernization did not work well and radical ideas spread to the Academic community. Diverse interpretations of the staple theory were presented: 1) neo-classic export-led growth theory; 2) structuralist and institutionalist interpretations and 3) neo-Marxist interpretations. Those discussions had an impact on communications studies where 1) American style of mass communication studies; 2) institutionalist approaches 3) phenomenological approaches and 4) neo-Marxist political economy approaches were present. (cf. Raumolin 1985)

When the Programme in Communications at McGill University published a collection of studies in Canadian communications in 1975 it was stated that typical of the American studies was empirism, orientation to control and links to commercialism.

Instead, typical of Canadian studies was Canada's geopolitical marginality, historical perspective, a dialectical method and strong sensitivity to the social implications of technology. Hence, hermeneutical approaches are important. Regulation was viewed as a positive social mechanism and it was realized that information and cultural policy are closely intertwined (Robinson & Theall 1975).

Gail Martin and Patricia Hindley who had studied the creation of a closed circuit radio network to help aboriginal groups in Canada to overcome communication problems posed by language and isolation were critical of centralized one-way radio and television systems. They applied the framework of Innis to international development problems and presented a critical phenomenological approach. They claimed that the increased dominance of "spatially-biased communication" technology has had unhealthy effects. Firstly, it was destroying traditional human communities all over the world. Secondly, the rapid development of new technologies led to "new monopolies of knowledge", which were serving the interests of those who control those technologies. For instance, it was easier for a Canadian to know what is taking place in Washington D.C. than in their close neighbourhood. (Martin 1975; Martin & Hindley 1981)

According to them, "the new high tech communication technologies" were projecting human consciousness further and further away from local places. They were sceptical of the rapid adoption of television and satellite systems in the developing countries because they were difficult to maintain and prohibitively expensive to fill with domestic programmes. Hence, the cheapest solution was to buy American programmes made for the mass market. They insisted that "oral tradition" should be allowed to persist. Relatively simple and inexpensive "two-way" radios were appropriate tools in achieving national goals of literacy, contact with rural groups, and the improvement in health and medical care.

Latin America

Latin American economists developed a centre-periphery approach of their own in the late 1940s and in the 1950s. They saw the relative decline of prices of raw-materials based commodities vis-à-vis industrial products in the international economy which made it impossible for underdeveloped countries to improve their position. They also studied many structural problems in Latin American economies, such as enclave economy, inflation and unequal land ownership. Hence, they proposed the creation of national companies and an import-substituting industrialization as well as promoted regional integration.

As conditions did not ameliorate and a revolution took place in Cuba, more radical theories were created in the 1960s. Dependence theory emphasized long-term structural conditions of underdevelopment closely related to the capitalist world economy. Those theorists stressed the role of multinational companies and their dimensions of dependencies included culture as well as science and technology. "Mechanistic interpretation" considered revolution to be the only means to break dependencies while "dialectic interpretation" studied national

cases and saw the possibilities of "associated-dependent development" (Cardoso & Faletto 1978).

The radicalization of the discussion and politics contributed to military coups in the 1970s and many development economists and theorists were obliged to emigrate. Mexico was the only large Latin American country which did not experience military coup. Hence, it was an important place for Latin American discussions when communication studies adopted radical and critical directions in the 1970s. The Chilean Juan Somavía created and became Executive Director of ILET which became an important platform for the discussions of NIIO (Somavía 1977).

He wrote in 1977 that far-reaching changes were necessary in most Third World societies and new national development strategies centered on the satisfaction of human needs, endogenous in their conception, self-reliant in their implementation and respectful of the environment were necessary. He also emphasized pluralism and participation.

He referred to many historical dependencies and to a wide and expanding disequilibrium between industrialized and Third World countries. Consequently, the creation of a "new international economic order" (NIEO) had become a new aim. The issue of international communications should be analysed in this context. It was no wonder that a wide disequilibrium in the flow of international communications was prevailing.

Somavía wrote:

> The existing transnational communication system is a whole: it includes, news agencies, advertising enterprises and data banks, as well as information-retrieval systems, radio and television programmes, movies, radio-photographs, magazines, books and "comics" with international circulations, together with the hard- and software technologies that underpin their development. Its different components, which originate mainly in the industrialized countries, reinforce each other, stimulating the consumers´ aspirations to forms of social organizations and life styles imitative of industrialized market-economy countries, which, as experience has shown, can only attained in the Third World on the basis of a high and growing concentration of income in a few hands and unacceptable social inequalities. (Somavía 1977: 139–40)

According to him, what was required was the practical application of a truly free flow, that is, a multidirectional and multidimensional flow. It was necessary to create conditions for the emergence of complementary channels of information. This did not, however, mean fostering government control over international information.[5]

[5] Somavía stated that reformers were accused of being oriented towards a radical elimination of certain existing freedoms and principles of international information or being in the service of totalitarian ideologies.

Noreene Janus and Rafael Roncagliolo who were senior researchers at ILET dealt with advertising, mass media and dependency. According to them little attention had been paid on the study of international advertising. Large resources were allocated to commercial advertising in the developing countries. This promotion of Western advertising led to cultural deformation and it transformed the mass media into instrument whereby the individual was turned into a consumer instead of being a citizen. They asked for a United Nations conference to discuss of actions to be taken concerning the economic, cultural and political impact of advertising (Janus & Roncagliolo 1979).

The Uruguayan development theorist Julio Barrero who was associated to the World Association of Christian Communications (WACC) well presented the aims of emancipation prevailing in Latin America vis-à-vis communications in the context of the NIIO at the early 1980s. According to him, the competition of the USA and the Soviet Union to world domination created a bias in the discussions. The control of communications and the use of information technology in the states that had adopted the doctrine of national security created scepticism of centrally controlled communication systems (Barrero 1984).

The discussion of technology dependency and the conditions of technology transfer was an important part of the discussion of NIEO and NIIO. The UN even organized the United Nations Conference on Science and Technology for Development (UNCSTD) in Vienna 1979. In this context, some authors were calling for a "new international technology order" (cf. Madeuf 1981).

The Brazilian political economist Fabio Erber dealt with the important question of strengthening technological self-reliance in the developing countries, in particular, Brazil. He stated that the government's intention of increasing the degree of technological self-reliance stood in open contradiction with a widely accepted interpretation based on the dependency theory that the Brazilian pattern of development was the "associated-dependent model" par excellence. Some theorists solved this contradiction by distinguishing the "implicit technological policy" from "the explicit one." They were claiming that the reality in Brazil was the implicit policy which did not produce any break in dependencies. But according to Erber, the state of affairs was much more complex (Erber 1980).[6]

The Brazilian official plans stressed the need to, at the same time, increase the absorption of technology from abroad and to increase the capacity for self-reliance. The organization for planning for science and technology was improved in 1974 when the National Council for the Development of Science and Technology was established and the role of the funding organizations FINEP and BNDE was clarified.

[6] Compare with Fernando Henrique Cardoso's ideas or those of the American development sociologist Peter Evans (Cardoso & Faletto 1978, Cardoso 1984, Evans 1979).

A major problem was, however, that Brazilian companies were satisfied with a low level of domestic technological effort and a strong reliance on imported technology. In fact, the pattern of development seemed to be based on a "licensing alternative". The companies were accepting their subordinate economic role.

But nationalism remained an important determinant of policies within parts of the state apparatus. Some nationalist institutions even gained a relative autonomy, such as the military establishment, which resulted in initiatives like aircraft and mini-computer programmes. The main actors to promote such initiatives were national funding agencies and development banks and a part of military establishment. They were supporting the creation of a "national scientific and technological system" with links to research institutes and universities. The increased political and economic importance of new technico-professional groups should also be mentioned.

In spite of all this effort there was no indication that the Brazilian public and private companies had changed their preference for foreign technology. Consequently, the operation of market forces was favourable to reliance on licensing. Hence, the promotion of "local design capacities" met with difficulties. The range of products to which nationalist policy was likely to be adopted was limited. The foreign companies would oppose any preferences given to Brazilian companies. Their resistance would be supported by many Brazilian companies engaged in the importation of foreign technology. The availability of risk capital was limited and a nationalist policy depended on the close cooperation between the state and companies which was not guaranteed.

State intervention to promote local design required, in fact, a long-term prospect and a general industrial strategy. The state tended, however, to follow a short-term and piecemeal approach to industrial policy. There were deficiencies in the planning structure, lack of coordination and lack of communication with the executive institutions. Such limitations seemed to belong to the main political and economic conditions of the Brazilian pattern of development.

Hence, according to Erber's analysis the Brazilian state was not a "development state" in the sense we are speaking about the Asian development state e.g. in South Korea. The industrial and technological policies were heavily dependent on the existence of the military regime, a shift to civilian power did not seem to produce positive effects in this respect.

The World Employment Programme (WEP) of the ILO commissioned a study about the impact of new microelectronics in 1979. Its author was the Chilean development expert Juan Rada who was Faculty Member of the International Management Institute in Geneva. His pioneer report was published in 1980. Rada knew well, among other things, the discussions of international organizations, NIEO and NIIO, Latin American development theories and

discussion, Canadian discussion and the French discussion which started after the publication of the Nora-Minc report on the social effects of the new information technology in 1978 (Rada 1980b).[7]

Rada stated that the current debate was focused on the two major socio-political issues: "the ownership and flow of information" and "labour displacement". The first issue raised problems of international dependence created by transborder data flow. The concentration of processing capacity in one country could result in a loss of economic opportunities as well as research facilities in other countries. In addition, it was difficult to safeguard privacy and security. Finally, as multinationals were major users of transborder data flows it was difficult to monitor those flows.

In contrast, the debate on the effects on the labour market was full of forecasting difficulties and very different views were presented. Rada established that there was a "lack of proper understanding of the effects of science and technology on the society". There was also "no consistent theory to grasp the multidimensional aspects of information".

When he dealt with the spread of new technology he established that Argentina and Chile had reduced import tariffs which produced a rapid penetration of imported computers. Their rapid penetration was partly due to the strong marketing effort of the main manufacturers like IBM who were constantly looking for new markets. In contrast, Brazil had established a national policy for information technology.[8]

There were many cultural and social implications which were the subject of public debate, in particular in Europe where the alternatives of "a technocratic centrally organized system" and "a more decentralised and individualist system" were present.

Two short-term limitations were the ignorance of new technology and the lack of interest of potential users.

In dealing with the constraints of diffusion in the developing countries Rada emphasized that the most important technical obstacle was the inadequate telecommunication infrastructure and services amplified by power cuts and other anomalies. New technologies were designed for the markets of the industrialised

[7] In a parallel article Rada criticised social scientists for not paying attention to the impact of new information technology (Rada 1980a). The French and Canadian governments funded series of reports on the impact of the new ICT. It is no accident that those two governments have opposed the free trade in audiovisual products and they also actively supported the promotion of a convention on cultural diversity within UNESCO.

[8] Fabio Erber wrote an article on the Brazilian policy in ICT where he presented parallel arguments as in his earlier article quoted before. When the Brazilian military government reserved the national mini-computer market for Brazilian companies the American government pursued efforts to open up this "promising" market to American multinationals e.g. in debt negotiations (Erber 1985).

countries. In fact, the existing computers were underutilised in most of the developing countries. Ready-made software programmes were difficult to apply. Hence, there was an evident need to develop new applied software in the developing countries as well as to develop new skills.

Rada called for a careful evaluation of the advance of information technology because its effects are felt primarily in the service sector which has been the job creator in the past. The pragmatic policy of mixed technologies seemed to be most appropriate.

The semiconductor industry has been searching for low-cost labour for the most intensive phases of manufacture, such as the assembly of chips. The transfer of assembly plants was taking place from higher cost Asian countries like Hong Kong and Singapore to lower cost countries like Thailand and the Philippines. Instead, South Korea was aiming at developing the production of the most advanced integrated circuits and computers. The exports of Korean electronics industry products had rapidly increased.

Large Asian countries like China and India had developed significant national industries and those were moving towards the large scale integration of circuits. This process was supported by strong protectionist measures which resulted in high prices. Rada stated, however, that an increased number of the developing countries would follow the Indian example. The low labour costs combined with well educated labour force would draw software work from the developed countries to the South, in particular, to India in the future.

Rada stated that computer technology was becoming an important tool of scientific and technological research. The leading databanks belonged, however, to private American companies like Lockheed and System Development Corporation. The EC countries had, for their part, created a Euronet network in 1979. Those developments would increase "the scientific and technological gap" between developed and developing countries. It seemed to be so that data which provided the basis for decision-making would flow toward richer nations but information reflected in decisions already taken would flow to poorer nations.

In his conclusions, Rada emphasized that we were living in a situation characterised by a rapid and revolutionary technological change as well as the rapid spread of new information technology. It was urgent for the developing countries to react to new challenges. A slow reaction would signify that in some cases they would have no choice in the end. Rada used notions like "electronic brain drain" and "information rich" and "information poor" in this context. Information was not value-free, it corresponded to a particular concept of assessing and pursuing progress.

Table 1.

INEQUALITIES IN COMMUNICATIONS AND ICT IN THE 1970'S

Unequal Conditions

- literacy
- libraries
- bookshops
- paper production
- printing machine industry
- electricity production
- telecommunication equipment industry
- radios
- control of radio frequencies
- televisions
- computers
- software
- space and satellite technology
- microelectronics
- digital machine tools and robots
- consumer electronics
- culture industry
- scientific research
- R&D, innovations and patents

cf. availability and accessibility of paper, books, press, telephone, computers, radio, television, movies, news, scientific publications, data

Domination of Western Multinational Corporations

- pulp and paper industry
- electronics industry
- publishing companies
- news agencies
- media companies
- movie companies
- telecommunications companies
- advertisement companies
- satellite companies
- data banks

cf. metaphors of the gap between "info rich and info poor" or "data rich and data poor"

Rada claimed that developing countries should be encouraged to look for alternative development paths. In his opinion, too little had been done to develop an alternative concept of science and technology. Hence it was important to promote the creation of a "more comprehensive body of knowledge" in relation to science and technology and their effects.

NOTES FROM ASIA

India

UNCTAD was actively engaged into the promotion of NIEO and it commissioned several reports to promote this idea. Ashok Parthasarathi who was Secretary of the Electronics Commission of India prepared a report "Electronics in the Developing Countries" in 1978 where he presented the comparative experience of Argentina, India and South Korea. He proposed to developing countries to follow the Japanese model which included consistent state support, the protection of the home market and the export-direction. He also dealt with cooperation possibilities between the developing countries in building the industrial capacity (Parthasarathi 1978).

Parthasarathi participated into discussions concerning the UNCSD. He criticised the search for alternative development models because without a strong state effort to promote modern technologies "the main muscle of industrial power" would be left in the hands of transnational companies and the industrialized countries. He wrote that many experts in the North were holding up China with her biogas plants and barefoot doctors as a model for the Third World, but they did not mention her expensive nuclear weapons, strategic missile programmes, and massive steel and petroleum programmes (Parthasarathi 1979a).

Parthasarathi also presented India's efforts to build an autonomous capacity in science and technology for development. For instance, the Electronics Commission and the Department of Electronics were created 1971 and the Space Commission and the Department of Space were formed in 1972 with the aim at attaining self-reliance in the shortest possible time. He set a contrast between the Korean model and the Indian one. The Korean model was based on export orientation and foreign investment and technology in the first phase but the Indian model had been to block the foreign ownership and foreign control in general. The aim was to internalize skills and to acquire self-confidence before turning outwards (Parthasarathi 1979b).

After satellite technology made a breakthrough in the early 1960s, new civilian applications were looked for, in particular, in the USA in the 1960s. This led to ideas to apply satellites to promote education in the developing countries. One of those experiments was the SITE project in India. K. E. Eapen who built the modern communication studies in India evaluated critically the SITE project, the expensive experiment to solve the education problems in poor rural areas by means of high-tech i.e. satellite-based television instruction. According to Eapen, the problem of education in the Indian countryside was not to use a few more

television sets but to increase funding for education which would allow more and better schools and more and better teachers (Eapen 1977, 1986).

Iran

Mohammed Reza Pahlevi tried to develop Iran by a forced modernization from above in the 1960s and the 1970s. According to American modernization theories, modern communication means like television were used to promote modernization and Westernization. This led, however, to a strong opposition which, by and by, became religiously oriented. Then, a revolution took place in 1979 where conservative Shiia mullahs seized power.

In this context Hamid Mowlana dealt with the paradox of communication in Iran. He claimed that the use of television desacralised shah and hence, reduced the legitimacy of his authoritarian power. Controlled public communications became separated from the realities in the country, by and by. Instead, informal news circulated in bazaars and various meetings. Islamic conservative and anti-Western fundamentalists used modern sophisticated Western technology to spread their message (Mowlana 1979).

Political economist and short-term President Abol-Hassan Banisadr presented a long-term cyclic and historical interpretation of power in Iran. According to him, history, civilization and symbols play an important role in popular consciousness and political communications in Iran (Banisadr 1980).[9]

VIEWPOINTS FROM AFRICA

Several African authors like the Nigerian communication theorist Frank Ugboajah have stressed the central role of "oral communications" in the traditional African communications. Hence, this background should be taken into account as a starting point in the preparation of communication development plans in Africa. The use of local radio as cheap and appropriate tool has been emphasized in this

[9] This point of view stressing the role of traditions and civilizations has continued in Iranian studies in communications. Hamid Mowlana has emphasized the importance of indigenous communication and Majid Tehranian has looked for a new communitarian paradigm. In his view, one has to recognize the need for spiritual-mythological foundations of communities. He argues that the processes of modernization have incorporated the entire globe in seven successive phases during a long history. Philosopher Darius Shayegan has written meta-historical reflections on history from a several thousand year perspective. He draws parallels between Ancient gnostism and religious mysticism which were looking for revelation and light to catch truth and heaven, and the Western mythical and utopian view of information technology which sees information as an anti-entropic force offering freedom, plenty and liberation from nature (Mowlana 2001; Tehranian 1997; Shayegan 2001).

context. The availability of electricity is not necessary and local languages can be used (Ugboajah 1979).[10]

There are, of course, also Modernist and neo-Marxist political economy paradigms in African communication research. Conflicts between different schools became pronounced with the spread of mobile telephones and internet in the 1990s. The Nigerian scholar Luka Uke Uche, for instance, has emphasized that instead of talking about oral communications, it is indispensable to promote modern information and communication technologies in Africa (Uche 2001).[11]

I shall present ten African point of views of ICT in the following. This section is based on my article published in Finnish in 2002. This part is different from the earlier ones as it deals with the contemporary discussion from the 1990s onwards. It can be justified because African discussion was not yet very developed in the 1970s. New technologies, in particular internet, were introduced in the 1990s (Raumolin 2002b).

Table 2.

TEN AFRICAN POINTS OF VIEW OF ICT AND DEVELOPMENT

1. White consultant from South Africa
2. Egyptian minister
3. African professor in engineering, medicine or natural sciences
4. Young Tanzanian man in front of an internet café
5. Nigerian professor Olu Oguibe
6. Kenyan computer expert Mayuri Odedra
7. Deputy director of a computer centre in an African university
8. Philosopher from French-language West Africa
9. Artist and organizator of the First African Social Forum Aminata Traore from Mali
10. Representative of an African NGO

This table is based on my interviews in Tanzania and South Africa as well as on literature and internet sources. South African white ICT consultant has been

[10] This is close to the argumentation of Canadian neo-Innisian authors like Gail Martin presented at the same time. He had gained an experience concerning the developing countries as well.

[11] Cf. also Alhassan 2004.

typical of Sub-Saharan Africa since the early 1990s. South Africa has been by far the most advanced county in ICT in Africa and, hence, some experts realized that there are market chances opening up elsewhere in Africa. They have adopted, in general, American concepts and see opportunities of technological leaps and a shift toward information society.

The Egyptian government has adopted ambitious targets in the development of ICT. Egypt has been a training centre in the Middle East traditionally and new regional training and research centres in ICT have been created there. New satellite-based TV programmes are distributed regionally. The new Alexandrian library is aiming at collecting documents also in electrical form. Egyptian ministers are hoping for that this country would become "a new India" based on cheap software and attracting foreign companies.

African professor in engineering, medicine and natural sciences is claiming that both professors and students would like to possess rapid internet-based connections to the West. According to them, internet is a necessary means to get up-to-date Western knowledge and to develop international research co-operation.

Young Tanzanian man in front of an internet café in Dar es Salaam answers to the question whether the use of local languages like Swahili is needed in internet: "It is not necessary because English is the language of internet".

Nigerian art historian Olu Oguibe has written that a new cybergeography is taking shape in the world. Since access to internet is independent from place, this results to new geography. There are certain places in African cities where active developers of new software exist. Hence those places are part of the centre of new cybergeography in the world (Oguibe 1996).

Kenyan computer expert Mayuri Odedra claims that no new computer is needed in Africa before the existing computers are properly used. In her opinion, the international electronics industry and donors are forcing new technology to Africa. The continuous imports of new technology excerts a negative impact of the balance of foreign trade. Typical of the countries in Sub-Saharan Africa is a structural gap between the exports and the imports (Odedra et al. 2001).

Directors and deputy directors of the computer centre in an African university are real experts in ICT in Africa. According to them, uneven electrical current and power cuts, the various and poorly integrated computer park including clones, the spread of viruses and excess humidity and heat create serious problems. Software which has been developed in stable conditions in the West is poorly working in these unstable conditions. Hence, it is necessary to develop new African software, which would be appropriate to African conditions.

Philosopher from French-language West Africa is not necessarily very enthusiastic about internet. According to him, this new technology typically

represents Western high tech and the Western aim to dominate the world. It mainly uses English language and only a thin elite is using it in Africa. African content is also missing in internet. Instead, radio is appropriate because it is cheap and suits well to oral traditions, local languages and two-way communication. It has also been an important means which has contributed to the democratization process in Africa since the 1990s.

Artist and activist Aminata Traore has established that the idea of a technological leap is not realistic in a poor African country like Mali. According to her, African intellectuals far too easily adopt new Western slogans and models of thinking. Instead, they should use more the brains of their own and develop endogenous solutions to the development problems in Africa (Traore 2002).

Representatives of African NGOs are generally enthusiasts about new opportunities offered by internet. In their opinion, internet is a vital tool in keeping and extending communication networks among NGOs. They also emphasize the need of training and the building of new communication networks.

FINAL REFLECTIONS

The entry to the 1980s did not favour any development alternatives but it signified the rise of neoliberalism. After Margaret Thatcher had become Prime Minister of Britain, Ronald Reagan became President of the Unites States. After the rise of interest rates in the USA, heavily indebted developing countries ran into crises starting from the Mexican crisis in 1982. Then, the developing countries became targets of structural adjustment programmes.

Thatcher and Reagan forced Britain and the USA to leave UNESCO. Consequently, the reformist projects like NIEO and NIIO were put aside. A free market and new technologies were seen to solve all problems.

New technologies were introduced in the 1990s resulting "new revolutions, eras, societies and economies". Finally, it was established that the world was characterised by a "digital divide" This discussion was a repetition of the discussion in the 1970s in many respects. The discussion of digital divide has been, however, much narrower than the discussion of inequality in the 1970s: it mainly concerns access to new technology.

There are scholars who consider pluralism and diversity important and the need for appropriate theories of national and local conditions. They see scientific relations as a part of centre-periphery relations of the world. This is a peripheral view.

On the other hand, there are scholars, in particular, in the centre who represent monopolies of knowledge and universal ideas and see the diffusion of ideas and theories from the centre as a normal phenomenon. Scientific institutions

and international organizations dominated by the centre, of course, support those ideas. This is the dominant ideology in the actual world.

But the problem of the lack of understanding that Juan Rada stated in 1980 is continuously relevant. There is a lack of proper understanding of the effects of science and technology on society. There is no consistent theory to grasp the multidimensional aspects of information. And it is important to promote the creation of a more comprehensive body of knowledge in relation to science and technology and their effects.[12]

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[12] Actually, the breakthrough of nanotechnology is a new challenge cf. Bensaude-Vincent 2004.

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