

Innovation in Africa - Toward a Realistic Vision

Bengt-Åke Lundvall*

Less than forty years after Rosenstein Rodan's (1943) seminal article that started the era of 'classical development economics' Hirschman (1981) gave an address where he recognised that the era had come to a close. Hirschman pointed out that he and his colleagues had overestimated the power of their ideas to overcome underdevelopment and specifically he referred to a lack of respect for the emotions and culture of those who were expected to realise the ideas.

I believe that Hirschman was right, not least concerning the African experience, and this is one reason why I see the establishment of a strong research capacity on innovation and economic development within Africa as fundamental for the formation of strategies that can bring Africa out of underdevelopment. And I see the start up of this journal as one important step in this direction. I am therefore happy to respond to Mammo Muchie's invitation to contribute with some ideas for this first issue.

In 2000 I co-organised the Aalborg workshop on innovation systems in Africa with Mammo Muchie, who initiated the project. It was the first time that I was confronted with the challenge to apply ideas about interactive learning and innovation systems to the reality of the African continent (see Muchie *et al.*, 2003). This workshop inspired the formation of the global network Globelics (www.globelics.org) and in 2005, we organised the third Globelics conference at Tshwane University of Technology, Pretoria, South Africa. Globelics is now preparing for the second time in Africa to organise the 7th conference in Dakar, Senegal, later this year. Some of the inspirations for this paper come from

* Professor of Economics, Department for Business Studies, Aalborg University, Aalborg, Denmark

browsing the many papers on innovation in Africa proposed for this international conference.

A Realistic Vision is neither a Dream nor a Plan!

Africa has one beautiful and one ugly face. It is a beautiful continent rich in terms of natural resources and amongst its people generosity and friendship are abundant. But both the statistics and a closer look show a different, harsher side of African reality. Millions of children live in poverty and illiteracy, many with serious health problems. Disorder in the form of local wars and crime contribute to the misery of several regions within the continent. Africa has been described as 'the scar on the human conscience'.

Is there any light to see at the end of the tunnel? The harsh reality seems to get in the way of well-intended strategies and plans. Assume that we design a plan based upon 'classical development economics'. We might begin by stating that the only way to grow rich is to industrialise, increase the savings ratio and make major investments in infrastructure, business and people. We might look for 'industrialising industries' and give priority to investment in those. We might recommend that a period of import substitution and regional integration is either combined with or followed by export-led growth.

But then we would have to realise the absence of the most important prerequisites for the success of such a strategy: an efficient state and a culture with strong emphasis on educational attainment and entrepreneurial spirit. The states are not strong and efficient and the culture does not promote the accumulation, diffusion and use of scientific knowledge. This hypothetical scenario seems to confirm the pessimistic reading for Africa.

One of the problems with this analysis may be that its focus is upon *what is missing*. An alternative approach might start from *what exists*. We know for instance that most of the population in Africa still live from agriculture and husbandry. We also know that, not least in agriculture, there is a tension between science-based technical solutions and local traditional knowledge. There is also a tension between the kind of western individualism that spurs private capital accumulation and the collective responsibility in Africa not only for the nuclear family but also for the extended family and members of one's village.

We believe that a *realistic vision* needs to take these facts as starting points – neither wishing them away nor seeing them exclusively as something that should be transformed as quickly as possible in order to

create room for respectively 'industry' and 'modernity' in the form of scientism and individualism. But neither can the vision ignore that there is a need for radical transformation of society.

What should be the direction for such a transformation? In this essay, I will start from the assumption that a systemic view with focus upon innovation, knowledge and learning brings insights that are useful when it comes to specifying a realistic vision to overcome the general pessimism about the future of Africa. Rather than setting up a very complex and insurmountable agenda, I will concentrate on a few mechanisms that might open up new avenues of hope.

From the knowledge economy to the learning society

The starting point is that the assumption that knowledge is the most important resource and learning the most important process (Lundvall, 1992; Lundvall *et al.*, 2006) is also valid for Africa. Second, we take into account that important elements of knowledge are tacit and that for all practical purposes the combination of explicit and tacit knowledge is fundamental (Lundvall *et al.*, 2002).

We also recognise that while some learning processes are science-based and make use of codified knowledge, equally important, is experience-based learning (Jensen et al 2007). The most important learning processes are interactive - they require that those interacting with each other have a common language for the communication. To overcome the uncertainty involved in the context of innovation, they also depend upon building mutual trust (Lundvall, 1985).

The competence to learn is critical to any society including Africa. By the competence to learn, we mean learning know-how through experience and through social interaction (Lundvall and Johnson, 1994). Formal education systems therefore need to give access both to relevant codified knowledge and to the competences necessary for life-long learning. The ideal education system is one that combines traditional teaching methods with methods that engage students in the solution of practical problems and that enhance social skills of collaboration and communication (Lundvall, 2008).

Different knowledge institutions may give different relative weights to traditional learning and problem-based learning. The strength of the innovation system will to a certain degree increase with the diversity of its knowledge institutions. In the case of universities diversification may be reflected in a combination of major classical universities (in the case of Africa, one major national or perhaps even only one major regional

university in each of Africa's six sub-continental regions), numerous open universities and technical institutions and colleges with strong interaction between higher education and society and, finally, technological institutes without educational tasks and with exclusive focus upon diffusion of knowledge to specialised users.

Innovation may be seen as a process with knowledge both as input and output. The input is codified and tacit knowledge while the output is constituted both by a concrete innovation and the enhancement of the competences of those involved in the interactive learning that is the basis for the innovation. Scientific information and R&D becomes more and more important for innovation in all sectors of the economy, including agriculture. But the same can be said about tacit knowledge and experience-based learning. As distance is suppressed and change becomes more frequent and rapid, individual and organisational learning becomes crucial for technical innovation (Jensen *et al.*, 2007).

Applying the learning society perspective to African development

Enhancing the knowledge base (both scientific knowledge and good practice know-how) for agriculture seems to be the most natural first step for an African strategy for development (Juma, 2008).

Here the innovation system approach is useful because it helps to understand that it is not narrowly focused only on investing in R&D and formal academic training, but also broadly about capability, learning, innovation and competence building systems for development or transformation. The quality of the relationships between knowledge expertise and institutions on the one hand and the competence of the users (farmers and herdsmen) on the other will determine the impact of investments. Therefore, feed-back from users is fundamental for the advancement and efficient use of knowledge.

Therefore a strategy to revitalise the agro-industrial innovation system would involve three elements:

- Investing in the training of scientific and technical expertise that will be of direct and indirect relevance for agriculture.
- Investing in the training of farmers to enhance their capability to absorb and use new knowledge
- Building bridges and networks between the experts and the users.

The three elements are interdependent. To support bridge-building the training of experts needs to have strong elements of problem based learning and strong interaction with farmers during the education

processes. Interaction with farmers will help experts to have a realistic idea about the farmers' culture and understanding of the world and will consequently make it possible to communicate 'alien' ideas from science in a form that is respectful and meaningful to the farmers. Land-Grant universities in the US are examples of institutions that combine academic teaching with extension services especially targeted at farmers (Graham, 1994).

Similarly, the training of farmers should aim at making them more open to science, technology and innovation expertise. Early contributions to innovation and entrepreneurship refer to the fact that absorption of innovations was much quicker and more successful in agriculture in regions where farmers had a higher level of education (Nelson and Phelps, 1966; Schultz, 1975).

Ideally the education should offer the farmers positive examples from the use of new methods and consider how the new procedures can be combined with traditional modes of production and distribution. Below we will argue that the Danish historical example of 'People's high schools' may be taken as one source of inspiration for expanding the education of farmers (Lundvall, 2002).

More direct forms of 'knowledge bridges' may be the establishment of local extension service stations that can draw upon formal knowledge institutions. Ideally these institutions should be shaped in such a way that they, without compromising their function to enhance the competence of farmers, are able to take into account local culture.

Who can do it-the State or a new agency?

We may believe that such an agenda should be realised by 'public policy' and by the state. In most positive examples of economic development the state has played a strategic role (Reinert, 1999). But given that the capacity of the state in most parts of Africa is quite limited, we need to consider if there are other agencies that might play a role. The global donor community might play a role (Juma, 2008), but the experience so far is that it has contributed more to foreign aid addiction than to development. While some NGOs contribute positively to development, none of these agencies seem to be able to play a central role in the transformation of the society.

There is a need to establish a new kind of agency. Here we could be inspired by the successful transformation of Danish agriculture in the second half of the 19th century. While the state played a certain role in transforming agriculture from being mainly crop-oriented to being

animal-oriented, the most important driver was 'the farmers' movement' (Lundvall, 2002).

The priest Grundtvig formulated the ideology that gave direction to the organisation of farmers into co-operatives. One of the most important elements behind the successful cooperative movement was the diffusion of 'people's high schools' training farmers in economic, societal and cultural issues. They offered not only training in useful skills but also instilled self-confidence among the farmers and prepared them for taking active part in the democratic processes in the society (Lundvall, 2008).

It is difficult to see a positive future for Africa without a similar kind of popular movement based upon the fundamental ideas of diffusing and sharing knowledge. To inspire such a movement, there is a need for a new kind of moral leadership that makes an attempt to reconcile indigenous knowledge with modern science and technology. Hopefully an emerging community of innovation scholars could foster such a leadership in its own midst.

Agriculture and industry

So far we have focused on agriculture. This might seem in conflict with the historical experience that industrialisation is necessary in order to establish sustained economic growth and to abolish poverty. Again Danish history is interesting. While many other economies developed industries based upon minerals and forestry, Danish industrialisation started from agriculture and Danish production and export specialisation remains a reflection of the link between agriculture and industry.

Agriculture constituted an important market for machinery for farming, slaughtering and dairying and as well as for chemical and biological industries. As productivity and income levels increased, markets for consumption good also expanded. The industries refining primary agricultural products became export oriented. Bacon and butter were for almost hundred years the strongest elements of Danish export specialisation. Cooperative ownership of the factories that refine the products was crucial in linking qualitative and quantitative progress in primary agriculture both to market needs and to scientific progress. The government supported agro-industrial development by building a specialised university focusing on the needs of agriculture and by financing standardisation institutes.

This strong interlinking and positive interaction between the different elements of the agro-industrial innovation system did not take place by itself. The organisational strength of the Danish farmers' cooperative

movement was critically important for the success. In Africa there is a need for a similar driver in order to build the knowledge base both for primary agriculture and for the industries that refine its products and the industries that can deliver its inputs.

Final words

In the realistic vision presented so far, I have overlooked many problems and issues that need to be addressed in order to make Africa a more attractive place to live and work. One fundamental issue is the tension between organising, managing and administrative agencies at and between different levels: local, national, regional and continent-wide. The heterogeneous character of nation states and the potential for ethnic conflicts within them is a strong argument in favour of developing strategies at the transnational level - i.e. at the regional or continental level.

The optimistic view would be that Pan-Africanism as a mission and the African Union as an organisational framework could become vehicles to realise the vision presented here. To exemplify, the attempt to build a 'Europe of Regions' is a modest attempt to link local level interests to the continental in Europe.

We have overlooked other serious problems that need to be addressed. Health problems, environmental problems, including land erosion, child poverty and lack of access to primary education are specific issues that need to be addressed to make life better for the majority. Here we see a formation of a new co-operative agency as a potential vehicle to cope with these problems. An enlightened co-operative movement might be necessary to build and run schools, health clinics as well as to establish local infrastructure.

Not everybody will agree that the vision presented here is 'realistic'. True experts on Africa may characterise it as a rather 'naïve vision'. My counter argument would be that without a vision there is no hope and Africa deserves hope.

References

- Graham D.L. (1994), 'Cooperative extension system,' entry in *Encyclopaedia of Agricultural Science*, 1: 415-430.
- Hirschman A. O. (1981), 'The Rise and Decline of Development Economics,' in Hirschman A. O. (ed.), *Essays in Trespassing: Economics to Politics and Beyond*, Cambridge: Cambridge University press.

- Jensen M. B., Johnson B., Lorenz E., and Lundvall, B.-Å. (2007), 'Forms of knowledge and modes of innovation,' *Research Policy*, 36(5):680-693.
- Juma C. (2008), 'Agricultural innovation and economic growth in Africa: renewing international cooperation,' in *International Journal Technology and Globalisation*, 4(3): 256-275.
- Lundvall B.-Å. (1985), *Product Innovation and User-Producer Interaction*, Aalborg, Denmark: Aalborg University Press.
- Lundvall B.-Å., (ed.) (1992), *National Systems of Innovation: Towards a theory of innovation and interactive learning*, London: Pinter.
- Lundvall B.-Å. and Johnson B. (1994), 'The Learning Economy,' in *Journal of Industry Studies*, 1(2): 23-42.
- Lundvall B.-Å. (2002), *Innovation, Growth and Social Cohesion: The Danish model*, Cheltenham, UK: Elgar Publishers.
- Lundvall B.-Å. (2008), 'Higher education, innovation and economic development,' in Lin J.Y. and Pleskovic B. (eds.), *Higher Education and Economic Development*, Washington D.C.: World Bank.
- Lundvall B.-Å., Interakummerd P., and Lauridsen J. V. (eds.) (2006), *Asia's Innovation Systems in Transition*, London: Elgar.
- Lundvall B.-Å., Johnson B., and Lorenz E. (2002), 'Why all this fuss about codified and tacit Knowledge?,' in *Industrial and Corporate Change*, 11(2): 245-262.
- Muchie M., Gammeltoft P., and Lundvall B.-Å. (2003), *Putting Africa First: The Making of African Innovation Systems*, Aalborg, Denmark: Aalborg University Press.
- Nelson R. R. and Phelps E. S. (1966), 'Investment in Humans, Technological Diffusion, and Economic Growth,' in *American Economic Review* 56(1/2): 69-75.
- Reinert E. (1999), 'The role of the state in economic growth,' in *Journal of Economic Studies*, 26(4/5): 268-326.
- Rosenstein-Rodan P. N. (1943), 'Problems of Industrialization of Eastern and South-Eastern Europe,' in *Economic Journal*, 53(210/211): 202-211.
- Schultz, T. W. (1975), 'The Value of the Ability to Deal with Disequilibria,' in *Journal of Economic Literature*, 13(3):827-846.