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Rapporteur Report¹

International Workshop on Innovation for Development: Converting Knowledge to Value

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Report by
Erika Kraemer-Mbula²

1. Background and context of the conference

The conference on “Innovation strategies in developing countries” was jointly organized by the OECD and UNESCO in partnership, and with financial support from, IDRC, UNESCO and SIDA. The workshop was planned as a direct input to the upcoming OECD Innovation Strategy that will be delivered in 2010. The OECD Innovation Strategy aims to provide analysis and tools that can be used by members to design and modify innovation strategies needed to address growing challenges in global markets.

The workshop convened a group of international experts that included researchers, policy practitioners, and other relevant stakeholders. Participants presented and compared different experiences and opinions about alternatives for development and promotion of innovation in developing and less developed countries (LDCs). The workshop was attended by 130 participants — 35 innovation specialists and practitioners and 95 observers and delegates from OECD (24 member countries) and UNESCO (36 member states), including seven African countries.

The sessions of the workshop covered various topics: knowledge and development; innovation and S&T for development; non-technological innovation; and knowledge sharing and knowledge protection in developing and emerging economies. These sessions were designed to promote discussion and generate some overall conclusions and recommendations for action.

This report discusses key issues that cut across different sessions and discussions of the workshop. Recurrent themes fall into eight areas: (1) innovation-driven development in an unsettled environment; (2) heterogeneity; (3) cross-cutting nature of innovation; (4) policy coherence; (5) learning from other experiences; (6) measuring innovation activities in developing countries and LDCs; (7) focus at the local level; and (8) generation of local

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² SPRU (University of Sussex), CENTRIM (University of Brighton), and Institute for Economic Research on Innovation (Tshwane University of Technology).

knowledge and knowledge transfer. Based on these interconnected themes, some challenges and recommendations have been drawn for three different actors: policymakers; the international community and donors; and the research community.

2. Recurrent themes

2.1. Innovation-driven development in an unsettled environment

The first sessions set up the global scene in which innovation takes place, and highlighted the strong but complex relationship between innovation and economic development. The concept of development is based on evolutionary economics, and development is seen as the process of structural change of the economic system. Development was thus defined as a constant process of change, with innovation identified as the critical driver of that change. Innovation however retained its more colloquial use and definition as the ability to solve problems. Innovation has the potential to affect development in many ways. It does not simply improve productivity in firms, it can also improve the way public services (such as health and education) are provided to the population and thus have a more direct impact on poverty.

First, it was highlighted that innovation currently needs to be considered in the global environment of economic recession. The economic downturn we are now facing has inevitable effects on the investment decisions of global economic actors, bringing higher uncertainty and risk aversion. At the same time, the economic crisis provides an opportunity and an incentive to improve efficiency and develop innovative cost-effective solutions in both developed and developing countries. Innovation was identified as a key driver of productivity and sustainable growth. In the current context of economic crisis, strong innovative performance becomes more important than ever.

Macroeconomic instability was identified as a highly influential factor that shapes decisions firms make to invest in human capital, R&D, and other inputs to innovation. However, it was pointed that it is at the level of the enterprise — rather than at the aggregated level — where innovative activities need to be looked at. It is at the level of the firms where the self-discovery and identification of national competences can be examined. It was argued that instability seems to be the norm rather than the exception in the contemporary global economic environment. Therefore, discussions about innovation strategy must seriously consider issues related to turbulence and macro instability because they affect the development of innovators in the context of persistent instability. Innovation strategies should not be developed under assumptions of stability.

Second, the global scene is characterized by growing inequality among countries. That is, the gap between growth rates of countries is diverging. Growing divergence between low-, medium-, and high-income countries implies the need for different approaches to the promotion of innovation. It was stressed during the workshop that the generic one

size, does not fit all, and that different countries call for different challenges in terms of policies to promote innovation and technological knowledge.

The theoretical insights corroborated the need to use a framework that acknowledges instability and heterogeneity as the contexts in which innovation and development take place. In summary, innovation strategies must take account of the global economy, its instability, and the significant inequalities between and within developing countries.

2.2. Heterogeneity

Heterogeneity arose as a major recurrent theme during the Workshop. It was agreed that diversity across countries, regions, sectors, and firms needs to be addressed, acknowledged, and welcomed to advance the way we think about innovation strategies.

First, heterogeneity needs to be tackled at the national level because development occurs differently even within economies. Innovations are not homogeneously spread across all sectors of the economy, firms, or regions. Differential patterns of innovation thus associate with different growth in different parts of the economy. It is important to acknowledge the differential growth drives structural change and therefore development.

Particular emphasis was put on the need to avoid straightforward recipes that consider countries as homogeneous. There are particularities that prevail in developing countries and LDCs — a larger presence of traditional sectors, agriculture, and the informal economy. However, even the proportions of these sectors (i.e., percentage of employment in the informal economy) largely vary across developing countries. This requires substantially different approaches to innovation strategies, and different institutions must play a major role in the innovation system. There was a general call to pay attention to context, history, path dependency, cultural considerations, and existing political regimes of individual countries in the process of designing innovation strategies.

Heterogeneity was also discussed in relation to FDI. The ability of FDI to contribute to innovative strategies in developing countries is also highly dependent on the context, needs, and local competencies of the domestic economy. The examples provided described the effects of FDI, which are highly variables across countries, sectors, and firms.

2.3. Cross-cutting nature of innovation

Innovation was considered as the ability to solve problems and overcome existing bottlenecks in developing countries. High-impact innovations in developing countries can affect aspects such as health service (e.g., HIV and malaria), infrastructure (e.g., electricity and transport), and agriculture. It was generally agreed that innovation strategies must be considered broadly, in relation to the development of human welfare, not solely in connection to industrial production — such as health, transportation, and other non-industry/non-production related bottlenecks.

The inclusion of science, technology, and innovation (STI) issues in the poverty reduction strategy papers (PRSPs) of developing countries was regarded as a major priority. In connection to this topic, the importance of defining areas and priorities with international donors and partners was considered key to providing effective support to overall development goals. It was pointed that there needs to be a common ground among international organizations, agencies, and governments to promote innovation at the many levels they affect.

The role of higher education and knowledge brokers was seen as crucial to transmit information among fields to various actors. A diversity of knowledge is necessary to effectively address the cross-cutting nature of innovation and exploit its full potential in various dimensions. In connection to this point, a relevant comment was made in relation to the terminology used by knowledge brokers. It is important to adapt research findings and academic advances to the language used in policy, and to package information in an effective way to get the message to policymakers.

2.4. Policy coherence

The theoretical framework depicted economies as overarching systems where many innovation systems coexist, develop, and disappear. In this sense, the theoretical contributions distinguished between the components of the innovation system (innovation ecology) and the linkages among these components. Both elements (components and linkages) need to be coordinated and reinforced within and across innovation systems. In relation to this point, it was stressed that although actions need to be coherent to the context where they are applied, they must also be based on sound theory.

Policy coherence was a widely discussed topic. It was widely agreed among participants that innovation policies need to include other policies not necessarily related to technology, but to other developmental policies with the ultimate goal of reducing poverty and achieving sustainable development. This requires broad coordination across policy departments.

Achieving policy coherence was linked to the ability of policymakers to attain the necessary knowledge to make positive decisions in relation to innovation. To do that, policymakers need to: understand the importance of committing themselves to an open innovation system – because it is impossible to forecast the long-term future direction of innovation; create the conditions upon which innovation can succeed – rather than picking up winners; and understand the local environment, both the ongoing “undiscovered” innovative activities and the local demand for innovations.

Adequate knowledge for coherent policymaking can be obtained by three major means:

- (1) By including all stakeholders in innovation strategies at an early stage of the design of local, effective, and coherent policies.

- (2) Through knowledge brokers — those agents that help bridge the difference between the policy research and the policymakers. Knowledge brokers (e.g., researchers, consultants, and science journalists) can package information obtained from research according to the needs of policymakers in appropriate time horizons. Their role is increasing in importance, especially in developing countries. There is very little research on the interaction between research on innovation policy and decision-making on innovation at the policy level.
- (3) By ensuring that policy experimentation provides feedback into the innovation system to allow systemic learning that leads to progress. For this purpose, monitoring and evaluation are crucial for the process of advancement of innovation systems. The results of monitoring and evaluation exercises need to feed into the innovation systems to be useful.

The meeting also stressed the importance of distinguishing between short- and long-term impacts. The direction of innovation strategies needs to be addressed by the government at an early stage, by having open discussion with all stakeholders to direct the strategy toward issues that have longer and larger positive impact on society.

However, coherence is not permanent, and because innovation is defined as problem solving, the problems and their sequence change over time. Therefore, the innovation system changes, and with it so does the need for innovation policies. It is important to keep innovation systems open to change (creative destruction).

2.5. Learning from other experiences

The importance of learning from successful and not so successful cases was emphasized during the workshop. However, some of the previous concerns were also reflected in relation to this topic:

- (1) Heterogeneity — how to produce measurements that are comparable over time across countries; and
- (2) Complexity and crossing-cutting nature of innovation — how to package the extensive knowledge necessary to tackle the complexity of innovation in a way that is useful for policymaking.

There were two main proposals to tackle these issues:

- (1) Dedicate more effort to producing in-depth case studies to deal with complexity and wide impact of innovation activities; and
- (2) Improve the exchange of information across stakeholders, including among governments in developing countries and the international community.

Some commentators challenged the conventional idea of learning as a passive process of experience accumulation, both at the level of the firm and policymaking. It was highlighted that learning in developing countries requires an effort and needs to be deliberate. The idea of innovation is not simply about learning how to do something

better but how to do something differently. In relation to this, there is extensive literature that points out that learning processes can be managed effectively to provoke and direct active learning both at the level of the firm and at the level of designing innovation strategies.

2.6. Measuring innovation activities in developing countries and LDCs

The need to develop adequate measures for innovation activities in developing countries was repeatedly highlighted as critical. There is an urgent and critical need to advance our understanding of the dynamic changes that are taking place in developing economies — not only innovation activities but also the impact of innovation on various aspects. There was a strong call for data and the development of indicators. However, this exercise needs to be aligned and done in conjunction with a more evolved understanding of what innovation is in developing countries.

There is a divergence in the way developing countries (e.g., in Africa NEPAD-ASTII Initiative) need to measure their innovative activities. Most indicators of innovation that are comparable internationally are pushing the direction of the measurements toward the global frontier-level of innovation. However, much of the recent literature indicates that innovation in developing countries tends to be incremental, informal, and mostly below the technology frontier. As a consequence, incremental innovations in developing countries and LDCs are not captured by existing measurement schemes.

Measuring innovation in the informal sector arose as a critical matter. The importance of understanding the informal economy is often disregarded although it accounts for a large proportion of employment in developing countries and LDCs. Research on innovation dynamics in the informal economy is needed to inform policy.

In addition, there was a call to measure skills formation that is taking place outside formal systems of education. There is a tendency to identify human capital with formal education. However, a great deal of human capital creation and human competences take place in the workplace, in many cases as a consequence of deliberate and explicit efforts and investments in the context of the firm. It is important that these practices are captured in innovation surveys in developing countries.

Finally, an important point was made in relation to the gender dimension. Particularly in developing countries, the needs and challenges of males and females for innovation are rather different. It is important to improve the gender disaggregation of innovation activities, and new statistics need to include this aspect.

2.7. Focus at the local level

Most participants strongly encouraged innovation strategies to be focused at the local level in the context of developing countries, because local entrepreneurs and local users

are best suited to understand the needs and possibilities of innovation. This aspect was also identified as a major challenge in technology-transfer processes.

The demand side of technology and innovation was highly stressed, in addition to the conventional focus on the supply side. Identifying the local demand for certain technologies was seen crucial, although a difficult task.

Many comments pointed that it is important to first understand what innovation activities and competencies exist at the local levels to effectively energize local entrepreneurs and institutions. Focusing at the local level can be a crucial element in identifying cost-effective solutions and innovations that are already taking place or can be shaped through joint learning with international donors.

The task of identifying unrecognized innovations by local entrepreneurs in developing regions was described as essential but daunting. Some examples were used to depict the large amount of existing cost-effective solutions to local bottlenecks in health services, infrastructure, and malnutrition — the full potential of which remain unexploited. One of the proposals to deal with this problem was to stimulate dialogue across the actors of the local innovation systems and to feed these dialogues into international partnerships with donors and knowledge transfer activities. There needs to be wider collaboration between education, the formal sector, the informal sector, local NGOs, and donors to bring about sustainable development.

2.8. Generation of local knowledge and knowledge transfer

Innovation strategies need to be put in a wider perspective, not only in terms of promoting innovative activities but also in terms of creating, deepening, and extending domestic capacities and competencies to do innovation. The need to develop local competences was widely discussed as a key issue — not only technical competencies but also managerial and organizational competencies at the firm and policymaking levels. The generation of competencies was seen as a decisive requirement for successful technology transfer.

In relation to this, the role of skills and capabilities was seen as crucial, although not sufficient, because of the need to go through the process of learning to convert knowledge into successful innovation. Nevertheless, even when the process of learning and knowledge conversion occurs, the translation of those capabilities into value very much depends on the existence of well-functioning markets. One of the problems in developing countries and LDCs is that the linkages between knowledge systems and commercialization are very weak, which hampers the conversion of local knowledge into competencies and value.

The *generation of local knowledge* raised a wide debate although common ground was found regarding certain aspects:

First, the importance of user-initiated innovation was seen to be of great importance. As mentioned above, local users were recognised as best suited to understand the needs and possibilities of innovation.

Second, there were concerns about ways of exploiting and protecting indigenous knowledge through intellectual property rights. The examples provided in relation to this particular issue were not conclusive because in different contexts and sectors IPRs can be of use while not in others — linking again to the issue of heterogeneity.

Third, learning and sharing information was stressed as a key mechanism not only to knowledge and technology transfer but also to the generation of new knowledge. The concept of knowledge transfer needs to be understood as joint learning (experimenting together to solve local problems) — some examples on the effectiveness of joint learning were provided for South Africa and Ghana.

Fourth, human capital and capabilities were central in this discussion. Many commentators questioned the ways universities and learning are currently structured to solve the problems of the poor, including the informal sector. How do you give autonomy in universities to change the curricula and promote needed research in developing countries?

The *transfer of knowledge and technology* was widely discussed. Conventional views on FDI and technology transfer were largely challenged by the participants, with the aim to better fit the context of developing countries and LDCs.

First, conventional views on FDI and technology transfer focus on R&D and other formal mechanisms. However, commentators raised the need to take into consideration unrecorded and incremental types of knowledge creation and transfer. These are hardly captured in FDI and technology studies related to FDI and technology transfer, although they are crucial mechanisms of innovation in developing economies.

Second, North–South transfer of knowledge is important but there is an urgency to expand our views on knowledge flows by paying attention to the growing importance of South–South (especially for non-high-tech innovations because they share similar needs) and South–North knowledge flows (how subsidiaries in some developing countries have become increasingly connected in a constructing and contributively way to the knowledge networks of MNCs in the North). Even in the few cases where South–South and South–North knowledge flows have been studied, the evidence is limited to emerging and transition economies. Very little work has been done on other developing countries and LDCs.

Third, concerns were raised about the underestimation of the huge contribution of knowledge transfer in non-manufacturing sectors (e.g., health and agriculture and the extractive, utilities, and services industries). These sectors are crucial to include in innovation strategy design exercises because for LDCs the contribution of these non-manufacturing sectors and services is growing at a much faster rate in terms of value

added than the manufacturing sectors. These sectors work in very different ways from manufacturing; therefore, issues on innovation policy and strategy are likely to be correspondently different.

Finally, spillovers are commonly considered as “accidental” in the literature and research, and perhaps more attention should be placed on “purposeful” efforts on knowledge sharing that can be managed and deliberately developed. It was commented that much of the knowledge transfer is in fact knowledge sharing — more reciprocal exchange of knowledge among actors that have different types of knowledge.

The question is: how do we help domestic companies in developing countries generate the knowledge and competences that will enable them to access the knowledge that will maximize their benefit from international collaboration.

3. Challenges and Recommendations

3.1. For policymakers

- (1) Innovation policies need to include other policies that are not necessarily related to technology but to development strategy — such as MDG, poverty reduction, and energy. This type of problem-solving requires serious efforts from a multidisciplinary approach.
- (2) Identifying direction for innovation. It is important for policymakers in developing countries to have a short-, medium-, and long-term vision for innovation strategies. In relation to this, innovation strategies need to be developed locally with a global vision.
- (3) Promoting innovation strategies that recognize value and impact beyond mere financial returns (such as social and environmental value). To do this policymakers need to target interventions toward:
 - a. Informal economy — given the duality of economies in developing countries we cannot restrict innovation strategies to the formal aspects of innovation.
 - b. Building innovation competencies — this include not only formal education but also learning within business enterprises, management, and policymaking skills
- (4) Facilitating the conditions in which innovation can translate into value. Because the linkages between knowledge systems and commercialization of knowledge in developing countries are very weak, governments can help improve or even generate markets (e.g., Thailand).

3.2. For the international community and donors

- (1) Getting innovation at the centre of the agenda. There is a need for larger coordination of the efforts of international donors in fostering innovation. Support to innovation needs to be mainstreamed in bilateral cooperation. A main challenge remains in integrating innovation into general budgets and in instituting collaboration among international donors. To achieve this, better communication among agencies is necessary.
- (2) Strengthening local partnerships and international linkages. It is important for international donors to identify local players with relevant knowledge to support cost-effective innovations — e.g., the identification of “innovations below the radar” with the support of local actors (e.g., local NGOs).
- (3) Engaging the foreign private sector with local actors to convert knowledge into value (from MNCs to rural communities), which also needs to be matched with local domestic efforts in competence building.
- (4) Replacing the concept of knowledge transfer by joint learning, knowledge sharing, and bidirectional reciprocal learning. It is important to understand joint learning as joint experimentation to solve local problems.
- (5) Ensuring the positive impact of the diffusion of foreign knowledge for developing countries. There is a need to link issues related to FDI, IPRs, generation of capabilities, and technology transfer.

3.3. For the research community

- (1) Facilitating the identification of the *value* of innovation for developing countries. It is important to recognize the role of both engineering and social sciences in developing innovation-related solutions for developing countries. The research community needs to devote efforts to:
 - a. Provide evidence-based advice in complex issues related to innovation. It is important to produce research outputs that deal with complexity but at the same time fit into the time schedules of policymaking.
 - b. Focus on developing case studies, as well as useful metrics for issues characteristic of developing countries. In relation to this, urgent advances are needed in relation to the particular dynamics in developing countries based on informal, unrecorded, and incremental innovations.
 - c. Need to involve users of innovation and technology in providing feedback and even leading innovation.
- (2) Facilitate shaping the direction and vision of innovation strategy.
 - a. Package information in a comprehensive way that can feed into policymaking — in this aspect the role of information and knowledge brokers is particularly important.

- b. Adapt the terminology to fit into various dimensions of development — innovation is a cross-cutting issue.
- (3) First steps on fostering transparency and engaging stakeholders in dialogue on policy issues from an early stage — bottom up approach. For instance, including a gender dimension in innovation-related research.

4. The way forward

The way forward included building on the networks resulting from the workshop, and engaging with the OECD through the work of the Development Assistance Committee (DAC), and with the relevant parts of UNESCO. In terms of the OECD Innovation Strategy, participants looked for outputs that were relevant to developing countries, such as guidelines for developing innovation strategies, seeking and using policy advice, and developing and using indicators of innovation. It is important to continue the dialogues on values, equity, and gender.

Discussion at the workshop illustrated the need for knowledge brokers and for applications relevant to development from existing OECD projects. An example project was the micro-data analysis of innovation data that could be used to examine incremental innovation with a view to establishing findings that might be applicable in countries where this is the dominant mode of innovation.

Finally, there was the suggestion that the knowledge of how the OECD Country Reviews of Innovation Policy are conducted be shared with other international organizations such as the World Bank, UNCTAD, UNESCO, and others, to develop reviews of countries outside of the OECD to the same standard as the existing reports. This would promote policy learning and lead to more informed discussion of innovation in development.