L. Prasad Pant and H. Hambly Odame, 2006
Multi-stakeholder deliberation on dialectical divides:
an operational principle of the systems of innovation.
Knowledge Management for Development Journal 2(3): 60-74
www.km4dev.org/journal

Multi-stakeholder deliberation on dialectical divides: an operational principle of the systems of innovation

Laxmi Prasad Pant and Helen Hambly Odame

Introduction

Deliberation on dialectical divides is key to the success of a knowledge management for development (KM4D) relationship, be it an interpersonal relationship or inter-institutional partnerships and linkages. A reflection on divides such as on the nature of knowledge as a public or private good is important in order to work through varying motivations influencing the formation of a partnership venture. Such a foresight needs to appreciate narratives of multiple stakeholders and interpret the phenomenon as contraries, such as dark and bright, rather than contradictories, such as black and white. In a formation period, shocks and challenges involved in a knowledge-based partnership are yet unknown, and as such a multi-stakeholder deliberation on all possible dialectical divides is important for success. However, imperfect information, human inability to process information correctly, and the rationality of an actor as influenced by the wider historical, socio-cultural, political and economic environment limit the deliberation process. In the theoretical context of Systems of Innovation (SoI) and the rubric of knowledge-based public-private partnership (PPP), this paper argues that multi-stakeholder deliberation on dialectical divides is more important than attempting to ignore or eliminate the divides. Eliminating or ignoring a divide would mean abandoning what may be a crucial stakeholder, and risks omitting an important holder or sharer of knowledge. The SoI has already been evolving in the context of low-income countries; however, its operational principles are not yet clear, and the deliberation of dialectical divides would be considered as an important operational principle of the approach.

The SoI are defined as the systems by which public and private stakeholders are engaged in implicitly knowledge-based scientific research, technology development and process and product innovations (Hall et al. 2001a). This has two principal components – structural components such as public-private partnership and functional components including research, development and innovation. New arrangements of the structural components are institutional innovations, and application of knowledge to generate social, ecological and economic benefits would be technological innovations. Technological innovation may be process innovation, such as a new way of doing things at a lower cost, and product innovation, such as launching of a new product in the market. As far as the structural component is concerned, PPP can be of three types: the public – non-profit private partnership, the public – for-profit private partnership, and a tripartite partnership of the public, non-profit private and for-profit

private sectors. The tripartite partnerships, which may engage actors in a deep process of stakeholder deliberation, characterize a well-developed system.

The remainder of the paper is organized into four sections. The second section deals with the theory and practice of PPP. The third section investigates the possible dialectical divides between public and private sector stakeholders with specific examples of success and failure stories of multi-stakeholder deliberation from low-income countries. A generic process of multi-stakeholder deliberation is discussed in the third section. The fourth section concludes the paper.

Theory and practice of public-private partnership

The practice of public-private partnership is not new to developing countries, but the systems of innovation theory which informs this practice is certainly recent conceptual work. This is especially true of the theory as it applies to rural and agricultural development.

Systems of innovation

It is argued that a broad concept of SoI is positioned in contrast to the transfer of technology (ToT) and may be a useful approach for promoting sustainable economic growth and well-being (Lundvall et al. 2002). In contrast to the linear relationships between scientific research, technology development, and process and product innovations, the public and private stakeholders may be jointly involved in these tasks and synergistically work as a system. The conventional division of labour between research and practice needs to be revised in the light of the systems of innovation. Although this is a new approach, its genesis dates back to the 17th century.

1. Genesis

The systems of innovation approach has its roots in Francis Bacon's 'The New Atlantis' (1626) and Adam Smith's 'The Wealth of Nations' (1776). Developments like disciplinary education, establishment of specialized laboratories, and improvements in techniques of measurement and experimentation that brought about the Industrial Revolution in Western Europe in the 18th century were speculated on by Bacon in his essay on 'The New Atlantis' almost a century in advance (Bacon 1901). The division of labour was also speculated upon by Adam Smith, of course, under the influence of Bacon. Both of them discussed a division of labor between knowledge producer and knowledge user, but none of them considered innovation as *systemic*. As well, Friedrich List, through his best-known work, 'The National Systems of Political Economy' (1841), introduced the concept of national systems of production, which emphasized the need to build national identity through infrastructure and institutions in contrast to the frontier neutral approaches of Bacon and Smith.

Theorists were preoccupied by technology, due of course in large part to the massive economic, political, and socio-cultural changes brought about by the Industrial Revolution and its precedents of capitalist expansion and imperialism in Latin

America, Asia and Africa (Wallerstein 1979). Until the last decades of the 19th century, economists were preoccupied with factor substitution deliberately considering technological change as a given variable (Ruttan 2001). Specifically a production function, causal relationship between input and output, did not consider technological change as an explanatory variable.

Although Malthusians did not ignore technological change, they focused heavily on other variables such as population growth, capital formation, diminishing returns and limits to growth. The interdependence between technological and institutional change was weak in their analysis. Nevertheless, Malthus originally drew attention to the self-organizing and self-regenerative capacity of natural and social systems. Since natural regeneration may stop at some point of natural resource exploitation, the limited capacity of a system to regenerate on its own is the rationale behind the concept of limits to growth advocated by the Club of Rome during the 1970s (Masini 2001). Then, early in the 20th century, Schumpeter's work played an important role in bringing technological change to the attention of economists. The Schumpeterian game was to regard technological change as different players pursuing different strategies in terms of competition and co-operation. There are five such strategies: pioneers, adaptors, imitators, complementers, and a mix of these strategies (Lundvall et al. 2002). The joint deliberations and actions of all relevant stakeholders determine which outcome actually occurs.

In spite of the above philosophical legacies, the modern concept of SoI as it applies to manufacturing evolved only during the second half of the 20th century. Burenstam Linder, a liberal economist and a former conservative minister in the Swedish Government may be credited for this concept (Lundvall et al. 2002). His essay on 'Trade and Transformation' (1961) inspired Bengt-Åke Lundvall, a Professor of Economics at the Institute for Production, Aalborg University, Sweden to work on this concept. A definition of the SoI is as follows:

> *The narrow definition would include organizations and institutions involved in searching and exploring-such as R&D departments, technological institutes and universities. The broad definition…includes all parts and aspects of the economic structure and the institutional set-up affecting learning as well as searching and exploring- the production system, the marketing system and the system of finance present themselves as sub-systems in which learning takes place.* (Lundvall 1992, p12)

An innovation system is frontier neutral until one specifies its scope, which can be local, sub-regional, national, pan-regional or global. While Lundvall introduced the concept of national systems of innovation (NSI), which is analogous to List's (1841) national systems of production, the qualifying adjectives were not initially distinguished in the literature.

2. The contemporary focus

The influence of the SoI literature as it relates to rural and agricultural development is a small and recent field of work that has attracted contributions largely from

agricultural economists and rural sociologists working with interdisciplinary perspectives. As early as the 1980s, sociologist Stephen Biggs (1981) highlighted the interdependence of technological and institutional innovations. He broadly classifies sources of innovation into central source – transfer of technology (ToT) – and multiple sources – systems of innovation (SoI) (Biggs 1990). However, the concept of SoI was not common in developing countries until the 21st century. There may be several reasons behind this delay, but the one related to institutional linkages is within the scope of this paper. As agricultural economists Hall and Nahdy (1999) argue based on their work in Uganda, there are systemic problems to implement new methods in old institutions. The greatest policy challenge is to devise ways in which public sector organized science can be integrated into the complex matrix of individuals and institutions engaged in the innovation process.

The field of innovation studies as it relates to low-income countries is deliberately evolving with the advent of the 21st century (Hall et al. 2000). Theorists seem to agree that SoI is the network of public and private sector institutions that influences the way of acquiring, generating, exchanging and using knowledge and information pertaining to a particular economic activity (Hall et al. 2001a). This literature is concerned with mapping and evaluating the process of innovation based on four analytical principles: assessing the extent of institutional interactions, assessing impediments to flow of knowledge between nodes, assessing the constraints to and opportunities for institutional innovation, and assessing policy and practices that can bring systems success or failure (Hall et al. 2000). In short, mapping and assessing the process of innovation involves how public-private stakeholders work as a system and establish multi-stakeholder linkages beyond the conventional focus on scientific research and technology development.

Structural typology of public-private partnership

Since the private sector can be non-profit as well as for-profit, the public-private partnership is constituted in three structural patterns.

1. Public – non-profit private partnership

In low-income countries, this type of partnership is most common. After the economic liberalization and subsequent mushrooming of the non-governmental organizations (NGOs), both public and private sectors felt that collaborative efforts would be more effective than the individual activities. On the one hand, as a strategy to sustain a project intervention, donors from the developed countries often insist that NGOs work in partnership with the public sector as an effective strategy for long-term sustainability of the project interventions. On the other hand, with the increasing advocacy for social mobilization and participatory R&D, government agencies are increasingly seeking partnership with NGOs. In addition to administrative deconcentration and political devolution, most governments have begun to entrust certain tasks to NGOs, often through the public-private partnership scheme.

This type of partnership may work for both conventional agriculture, such as starchy staples production for subsistence, as well as non-conventional agriculture, such as high value crops for domestic and export markets. Stakeholders are often involved in

pro-poor and pro-environment innovations (Ojha and Morin 2001). This type of partnership recognizes smallholder farmers as the potential entrepreneurs and attempts to transform the informal sector into for-profit sector. However, it generally does not bother to involve the for-profit sector as a key partner.

2. Public – for-profit partnership
Although this type of partnership is less common in developing countries, the public and for-profit sector in developed countries have increasingly worked together and the public-private partnership is often considered synonymous to this type of partnership. Theorists argue that developed countries have already passed through the stage of the public – non-profit private sector partnership and reached the stage of the public –for-profit private sector partnership (Gray, Malla and Phillips 2006). It is safe to speculate that low-income countries will follow the same trajectory.

The public sector is obviously eager to foster pro-poor and pro-environment innovations, but these goals are often overlooked by the influence of the corporate sector. Specifically, in low-income countries where government agencies may not be used to the corporate culture the for-profit sector, although small, can influence the government to meet their corporate interest, resulting in corrupt agreements between the public and for-profit sector. For example, noncompliance with taxation is a common occurrence where an informal economy operates at large and wealth is considered as an indicator of success.

3. Tripartite partnership
A tripartite partnership of the public, non-profit private and for-profit private sectors may address some of the limitations of the above two types of partnerships. This tripartite partnership is the contemporary focus of the SoI. Although this approach is robust in terms of theory, the operational principles are not yet clear. Multi-stakeholder deliberation on dialectical divides is one of such principles.

To summarize, this typology refers to the structural component of the SoI, and serves as an entry point for the process of multi-stakeholder deliberation.

Dialectical divides

In essence, dialectical divides may occur between two different sectors as well as within the same sector.

Inter-sectoral divides
The above discussion on the theory behind the public-private partnership reveals that the SoI refers to inter-sectoral linkages beyond R&D including systems of production, marketing and finance. In other words, systems of innovation encompass structural components such as public-private partnerships, and functional components such as scientific research, technology development, and process and product innovations. Here the focus is on the structural component of the SoI, which includes four specific

sectors: public, non-profit private, for-profit private and informal sectors. A combination of these four sectors gives six one-on-one linkages: public↔non-profit private, public↔for-profit private, public↔informal, non-profit private↔for-profit private, non-profit private↔informal, and for-profit private↔informal sector linkages (Figure 1).

To operationalize the SoI approach, one needs to investigate dialectical divides like flexible and rigid working styles, institutional and competitive funding, corporate interest and social responsibility, and public and private good nature of knowledge between each of these pairs of nodes. The relevance of these divides, however, depends on the partners involved from the respective sectors.

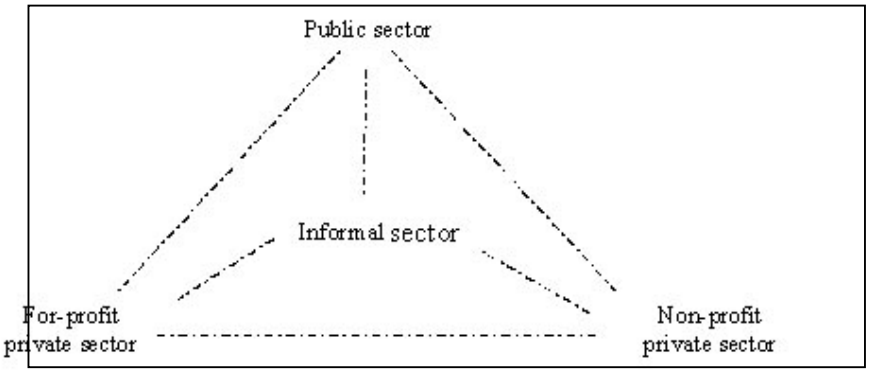


Figure 1. A tripartite partnership model with the informal sector at the centre

1. Between public and non-profit private sectors

The non-profit private sector actors like NGOs are autonomous from public institutions and embedded in the informal sector (Uphoff and Krishna 2004). The public sector is generally perceived as hierarchical and bureaucratic while the non-profit sector is widely perceived as flatter and flexible in organizational structures. However, this may not necessarily common to all non-profit institutions. Moreover, the NGOs usually work under competitive funding provisions while government often works under institutional funding provisions. The competitive grant system, however, is also being mainstreamed by the public sector to foster broad-based participation of actors from the private sector, both non-profit and for-profit.

Since both the public sector and non-profit private sector believe in the nature of knowledge as being a public good, deliberation on the above dialectical divides are relatively easier. However, traditionally NGOs often lobby for favourable policy environments with public sector actors on behalf of the informal sector institutions and constituent individuals. Where partnership negotiations between the non-profit sector and the public sector include substantial deliberation on the potential divides, a separate policy lobbying process may not be required or at least lessened. Interactions at different stages of a partnership venture help identify desirable policy options. Experience with a rice improvement project in Nepal illustrates this phenomenon (Joshi et al. 2006). Initially, the NGO (LI-BIRD) perceived public sector research and extension (R&E) as inefficient and overly bureaucratic while the public sector

considered the NGO as a lobbyist. Stereotyping each other was common. Later, they appeared to be collegial partners. As public sector institutions at different levels and places were not equally aware of institutional changes in the non-profit sector and vice versa, opening lines of communication at the national level took more time than at the local level. After a partnership of more than a decade, improved communications between the NGO and the public sector at the local and national levels helped bring about institutional changes with wider implications, such as a policy provision to register and release crop varieties developed through participatory plant breeding. In this case this was realized when the public R&E division and LI-BIRD both acknowledged a need to release varieties bred and selected through the participatory approaches. If LI-BIRD had attempted to achieve this through an independent policy lobbying process, it would have been a far more challenging process – and in any case would have taken longer. Therefore, a public-NGO deliberation on the common dialectical divides early in the process of partnership can further enhance the performance.

2. Between public and for-profit private sectors
Flows of knowledge between these nodes are constrained by perceived ideological differences; competition and risk particularly where valuable intellectual property rights (IPR) and financial resources are at stake; prohibitive transaction costs particularly where intellectual property exchanges are central to the relationship; and conflicting interests (welfare versus profit motives) (Spielman and von Grebmer 2006). In short, the basic divide between the public sector and for-profit private sector is regarding the corporate interest and social responsibility, and public and private good nature of knowledge.

The above divides are more significant in high-profile partnerships with for instance the involvement of foreign multi-national life science firms than in partnerships with small agribusinesses. The incentive to engage in partnerships, however, comes from the philosophy of corporate citizenship (Elbers 2004). While privatizing knowledge, the for-profit sector is required to think of corporate social responsibility, which is likely to be a factor in deliberations of the dialectical divides. At the local level, when small and medium enterprises are involved in partnership deliberations, the process is likely to be less cumbersome.

3. Between public and informal sectors
The divides between these nodes are often based on perception, types and sources of knowledge, and strategies. First, the perceptual divide is illustrated by paternalistic rather than participatory relationships between the public and informal sectors. For example, in Bangladesh, farmers' perceived the Rural Development Academy as a public institution, but protected within a fence and staffed by officers who would not talk to them. The public sector used to see farmers as the passive beneficiaries and the ultimate target groups. However, these perceptions have changed to some extent through the implementation of the poverty elimination through rice research assistance project (Van Mele, Ahmad and Magor 2005). A women's NGO worked as an intermediary to lower the height of the public fence while empowering the farming communities to access information and other resources.

Second, the divide in terms of types and sources of knowledge is illustrated by a agri-biotechnology project in India (Clark, Yoganand and Hall 2002). The public sector worked on a cost-recovery basis to produce propagating materials and bio-fertilizer in partnership with local NGOs. The public sector scientists tend to operate in ToT-mode even though farmers were not comfortable with them. Specifically, farmers proposed to develop local *Rhizobium* bacterial culture to inoculate their leguminous crops while the public sector continued to supply exotic cultures. Being a partner in the venture, the NGO recognized this communication barrier between the scientific community and the informal sector.

Third, the strategic divide is related to a mismatch between the government's priorities and farmers' priorities. For example, in the Red River Delta of Vietnam, government prioritized productivity of rice to achieve food security at the national level on welfare grounds, while food-grain sufficient farmers prioritized high value crops to increase cash income from their farmlands (Van Linh 2001). A genuine deliberation between policy makers and farmers would bridge this divide by enhancing contextual understanding.

4. Between non-profit private and for-profit private sectors

Since both public and non-profit private sectors have motives of public welfare and consider knowledge as a public good, each encounter the same divides in deliberations with the for-profit sector. NGOs are interested in welfare while the corporate sector is interested in making profit. NGOs consider knowledge as a public good while the corporate sector privatizes it. However, with the diversity of the non-profit sector, from activists to R&D-oriented NGOs (including farmers' cooperatives), this relationship can not be generalized. The more activist in nature the NGO is, the bigger the challenge will be to overcome the divides (Elbers 2004). Likewise, the for-profit sector is equally diverse, and the more a firm is disengaged by society by for instance the scale of operations, the more challenging it is to engage it in stakeholder deliberation.

An example of the tension between non-profit private and for-profit private sector comes from the relationship between the Federation of the Nepalese Chambers of Commerce and Industries (FNCCI) and farmers' cooperatives in Nepal (K.P. Pant, 2006, Personal Communication). The former work on profit basis and the latter on non-profit. Recently the government of Nepal entrusted the FNCCI to issue 'the country of origin certificate' to any party who is interested in exporting agricultural commodities from Nepal; but this body does not provide the certificate to the farmers' cooperatives simply because cooperatives are organized differently from corporate business companies. Although both parties have their own narrative of this tension, the basic divide arises from their profit and non-profit motives. The existing policy provisions fail to address this problem. Partnership between these two institutions through deliberation on such divides could help resolve this problem by enhancing understanding of the other's context and identity.

5. Between non-profit private and informal sectors

Although non-profit private sector agencies like NGOs, private foundations, farmers cooperatives are embedded within society and one would expect a collegial relationship, there are impediments to the flow of information in terms of social structures, such as gender, caste and wealth status, as illustrated by the rice seed health improvement project and a participatory video project in Bangladesh (Van Mele et al. 2005). The project owners required the implementers to extend partnership to a women's NGO, to hire more female staff and to work with women farmers. To bridge the divides, the stakeholders involved in deliberation researched different types and sources of knowledge, and involved rural women in developing and validating seed production, processing and storage technologies and the video scripts related to these processes.

6. Between for-profit private and informal sectors
The concept of spot market in the supply chain (whereby goods are sold for cash and delivered immediately), both in terms of input supply as well as produce marketing, undermines the flow of useful information between these sectors. However, as long as the informal sector, consisting of local input suppliers and produce vendors, is involved in the supply chain, this type of impediment is less severe than other forms of partnership1. For instance, agro-chemical retailers in Nepal serve as a source of information for both rich and poor farmers (Ojha and Morin 2001). Even the larger life-science firms are advocating corporate citizenship through the framework of the corporate social responsibility, which attempts to marry two contrasting interests - corporate profit and social benefit, and thus bridges dialectical divides (Elbers 2004). Empowerment of the informal sector actors would improve the quality of deliberation processes through enhanced equality of the stakeholders.

All in all, a tripartite partnership faces one or other dialectical divides. An ideal tripartite partnership of the public, non-profit private and for-profit sector with the informal sector at the centre, while involving cumbersome process, would benefit scientific research, technology development, and process and product innovations. These dialectical divides exist not only between stakeholders from different sectors, but also within the same sector.

Intra-sectoral divides
Although dialectical divides related to working styles, funding provisions, corporate interest and nature of knowledge are less likely to occur within a sector, there may be slightly different, but related intra-sectoral divides. Several decades' struggle for establishing linkages between public sector research and extension services is an example of an intra-sectoral divide (Agbamu 2000). Public sector researchers often perceive themselves as superior to the extension workers, and the extension workers consider themselves more embedded in society than the researchers. They seldom see each other as collegial partners despite being within the same sector. A case of mango post-harvest in India illustrates systemic failure in institutional arrangements, especially within the public sector actors involved in pre-harvest and post-harvest service delivery (Hall et al. 2001b).

With the given diversity among the NGOs from local to national and international, and from activist to R&D-oriented, clashes between NGOs are likely to occur. For example, two NGOs (the International Development Enterprise (IDE), India and Practical Action, UK) had a problem during the implementation of a tomato-packaging project in India. The cause was a ban on cutting down forest trees in Himachal Pradesh, causing a shortage of wooden boxes for packaging (Clark et al. 2003). This is what IDE recognized to be a key problem to help farmers access the tomato market, but Practical Action did not buy the idea, and thus the linkage failed.

In addition to differences in the perception of local problems, linkages may also fail due to ideological differences. In Nepal, for instance, most NGOs are directly or indirectly recognized as the affiliates of the respective political parties with their own agenda for social mobilization and strategy to claim as their credit to development work. As such, when NGOs originate from different affiliations, the divides between them may be even deeper than between actors from two different sectors. Often actors try to identify ideological differences before they actually get involved in a foresight exercise. In other words, actor ideologies often influence the deliberation process.

It is not unusual to expect divides within the for-profit sector, driven by competition, but part-determined by the size of a business. This is the case between corporate firms, but also between the larger corporate firms and smaller agribusinesses, as illustrated by the grassroots movement for fair trade: generally small-scale businesses trying to compete with giants.

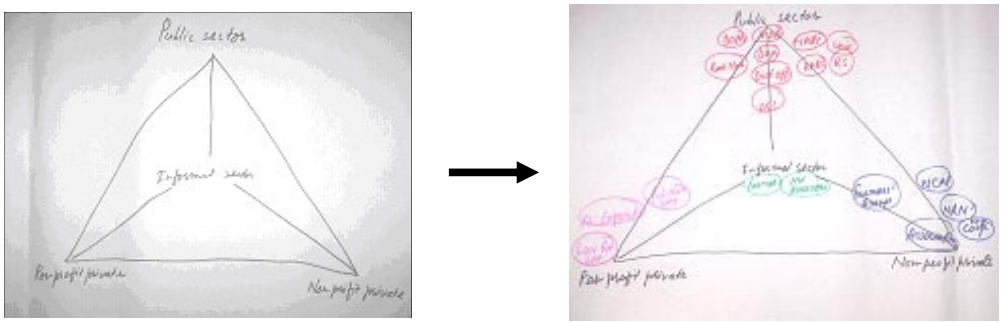
The informal sector is also a mosaic of social fabric, and as such one can expect dialectal divides in terms of social structure and processes. Social structures like gender, wealth status and caste create divides in both developed as well as developing societies. Individual worldviews also pull individuals apart. For example, in Nepal people get involved in everyday conflict merely because of their affiliation to a political group. The decade-long armed conflict has contributed to a further deepening of this divide.

In short, stakeholders should get involved in deliberation of dialectical divides not only between different sectors but also between institutions within the same sector. The specific procedure of multi-stakeholder deliberation depends on the stakeholders involved and the context under which they work.

Deliberation process

Since the type of stakeholder involved varies, the specific activities and the contexts under which they work are dynamic, and as such a cookbook to prescribe the process of multi-stakeholder deliberation does not exist. As the stakeholders and the context evolve, new activities need to be included to address newly emerging divides. However, stakeholders may consider the following six generic steps as a general guideline to run a deliberation process.

First, one should identify the stakeholders involved in a partnership process. To begin with this process, a model of tripartite partnership is proposed in which the representation of the stakeholders from the public, non-profit private, for-profit private and informal sectors (Figure 2a) are visualized. This graphical representation can either be superimposed with an existing Venn diagram showing the institutions in each sector and their intra- and inter-sectoral linkages or a Venn diagram can be drawn with reference to the tripartite partnership model (Figure 2b). This basic difference between the conventional Venn diagram and the tripartite model based Venn diagram is the categorization of institutions into the four sectors. This helps the stakeholders to visualize how complete the representation of different sectors in a partnership is, helping to identify causes if representation in one section is low or non-existent, and how this might be improved in the future.



(2a) (2b)

Figure 2. The tripartite model based Venn diagram as a visual aid

Second, once the stakeholders are identified, it is necessary to identify the existing and perceived dialectical divides between respective stakeholders within the same sector and between two or more sectors. The tripartite model based Venn diagram can serve as a visual aid. The cycle of the PPP consists of four components: motivation, initiation, operation and termination – and throughout the cycle this visual diagram can be updated and used as a springboard to initiate dialogue. Stakeholders can choose to keep all visual diagrams produced at different stages of a partnership, serving as an aid to trace the evolution of the partnership, and the associated dialectical divides. If any of the four sectors are missing, the stakeholders can analyse its effect on the overall systems of innovation.

Third, one should encourage the stakeholders to listen to each others' narratives on the identified divides. A practice of active, empathetic and critical listening is recommended at this stage. Stakeholders should actively listen to each others, trying to understand other points of view emphatically, and paying particular attention to alternative perspectives. One should be critical and consider alternative viewpoints or sources of information than one's usual paradigms. This can contribute to enhanced understanding of the multiple perspectives in a dialectical divide.

Fourth, while listening to each others' narratives, the stakeholders should be aware of existing policy provisions that are related to the identified dialectical divides. Public

sector stakeholders are the most aware of these and should as such play a leading role in this. However, information provided should be verified through alternative sources. As a deliberation process may take several rounds of discussion, there must be ample time for stakeholders to explore all available alternatives and verify narratives of other stakeholders.

Fifth, stakeholders should come to a written agreement on each of the divides, in particular where financial costs and benefits are involved. For example, the public and private stakeholders might agree on a formula to share revenue generated through patenting and licensing of an invention, such as a new crop variety. Agreements that are non-financial would be either oral or written depending on the preference of the stakeholders involved. However, it is recommended to document all the agreements for future reference, leaving room for revisions.

Last, no matter how successful is a partnership venture at the motivation and initiation stages, one can always anticipate agreements to be violated as a relationship matures. The more time one takes during the earlier steps, the lesser the chance of disagreement in later stages. In case of serious disagreement, third-party involvement can be beneficial to an objective resolution of the issue. Either way, it is recommended that the visual aids prepared in the initial stages towards the identification of the stakeholders and the detection of dialectical divides are regularly reviewed, including a review of the agreements that were reached during the process of multi-stakeholder deliberation. In such cases, third-party involvement may disturb the relationship dynamics, obstructing the possibility of stakeholders reinitiate a troubled partnership or initiate a new one.

Conclusion

In conclusion, the SoI framework elaborates the PPP, which may either involve the non-profit private sector, the for-profit private sector or both. The more types of sectors involved in a knowledge-based partnership venture, the more challenging it will be to engage in a meaningful stakeholder deliberation. One or more dialectical divides may manifest themselves, depending on the representation of the public and private sectors in a partnership undertaking. The emphasis should not be on the elimination or ignoring of such divides, but to involve the stakeholders right from the motivation and initiation of a relationship. Multi-stakeholder deliberation at early stages contributes towards the smoother maintenance and, if necessary, efficient dissolution of a partnership.

Although multi-stakeholder deliberation in knowledge management is not new to the field of agricultural and rural development, this has rarely been investigated as an operational principle of the system of innovation. However, this is just one among many other nascent operational principles of the SoI. Whatever additional operational principles are identified and developed, the multi-stakeholder deliberation can be an entry point for a productive public-private partnership. The tripartite model based

Venn diagram with the informal sector at the centre can serve as a template to initiate or investigate a partnership venture. In other words, it is equally relevant for system building as for system analysis. What is most important is to determine which divides exist in a particular partnership venture and how the stakeholders concur with each other in terms of the respective divides.

References

Agbamu, J.U. (2000). Agricultural research-extension linkage systems: an international perspective. *AgREN Network Paper* 106a, 1-8.

Bacon, F. (1901). *The New Atlantis (Written in 1626)*. P. F. Collier & Son: New York

Biggs, S. D. (1990). A Multiple Source of Innovation Model of Agricultural Research and Technology Promotion. *World Development* 18 (11), 1481-1499.

Biggs, S. D., and E.J. Clay. (1981). Sources of Innovation in Agricultural Technology. *World Development* 9 (4), 321-336.

Clark, N, A. Hall, R. V. Sulaiman, and G. Naik. (2003). 'Research as Capacity Building: The Case of an NGO Facilitated Post-Harvest Innovation System for the Himalayan Hills.' *World Development* 31 (11), 1845-1863.

Clark, N., B. Yoganand, and A. Hall. (2002). 'New science, capacity development and institutional change: the case of the Andra Pradesh-Netherlands Biotechnology Programme (APNLBP).' *The International Journal of Technology Management and Sustainable Development* 1 (3), 196-212.

Elbers, W. (2004). Doing Business with Business: Development NGOs interacting with the Corporate Sector. Centre for International Development Issues Nijmegen (CIDIN). Radbound University Nijmegen, The Netherlands.

Gray, R., S. Malla, and P. W. B. Phillips. (2006). Product innovation in the Canadian canola sector. *Supply Chain Management: An International Journal* 11 (1), 65-74.

Hall, A., G. Bockett, S. Taylor, and M.V.K. Sivamohan. (2001a). 'Why Research Partnership Really Matter: Innovation Theory, Institutional Arrangements and Implications for Developing New Technology for the Poor.' *World Development* 29 (5), 783-797.

Hall, A., N. Clark, R.V. Sulaiman, M. V. K. Sivamohan, and B. Yogandnd. (2000). 'New Agendas for Agricultural Research in Developing Countries: Policy Analysis and Institutional Implications.' *Knowledge, Technology, & Policy* 13, 70-91.

Hall, A., N. Clark, S. Taylor, and R. V. Sulaiman. (2001b). 'Institutional learning through technical projects: Horticultural technology R&D systems In India.' *AgREN Network Paper* 111, 1-12.

Hall, A., and S. Nahdy. (1999). 'New methods and old institutions: The systems context of farmer participatory research in national agricultural systems. The case of Uganda.' *AgREN Network Paper* 93, 1-10.

Joshi, K. D., S. D. Biggs, D. Gauchan, K. P. Devkota, C. K. Devkota, P. K. Shrestha, and B. R. Sthapit. (2006). 'The evolution and spread of socially responsible technical and institutional innovations in a rice improvement system in Nepal.' *Discussion Paper 8*, CAZS Natural Resources, University of Wales Bangor, Wales, UK.

Lundvall, B-Å. (1992). *National Systems of Innovation: Towards a Theory of Innovatin and Interactive Learning.* Pinter Publishers: London, UK, 12pp.

Lundvall, B-Å., R. Johnston, E.S. Andersen, and B. Dalum. (2002). 'National systems of production, innovation and competence building.' *Research Policy* 31, 213-231.

Masini, E. B. (2001). 'Future studies in Italy and the limits to growth.' *Futures* 33, 21-26.

Ojha, G.P. , and S.R. Morin. (2001). 'Partnership in Agriculture Extension: Lessons from Chitwan (Nepal).' *AgREN Network Paper* 114, 1-11

Ruttan, V. W. (2001). *Technology, Growth and Development: An Induced Innovation Perspective*. Oxford University Press: Oxford.

Spielman, D. J. , and K. von Grebmer. (2006). 'Public-private partnerships in international agricultural research: an analysis of constraints.' *Journal of Technology Transfer* 31 (2), 291-300.

Uphoff, N. and A. Krishna. (2004). 'Civil Society and Public Sector Institutions: More than a Zero-sum Relationship.' *Public Admin. Dev.* 24, 357-372.

Van Linh, N. (2001). 'Agricultural Innovation: Multiple grounds for technology policies in the Red River Delta of Vietnam' PhD dissertation, Communication and Innovation Studies, Wageningen University, The Netherlands.

Van Mele, P., S. Ahmad, and N. P. Magor. (2005). 'People and Pro-Poor Innovation Systems.' Pp. 257-296 In: *Innovation in Rural Extension: Cases from Bangladesh*, (edited by P. Van Mele, S. Ahmad, and N. P. Magor), CABI Publishing: Wallingford, UK.

Van Mele, P., A. K. M. Zakaria, R. Nasrin, B. Chakroborty, Md. M. Haque, and J. Rodgers. (2005). 'Bringing Science to Life: Video development for women-to-women extension.' Pp. 49-60 In: *Innovation in Rural Extension: Cases from Bangladesh*, (edited by P. Van Mele, S. Ahmad, and N. P. Magor. CABI Publishing: Wallingford, UK.

Wallerstein, Immanuel. (1979). *The capitalist world-economy*. Cambridge University Press: London, UK.

Abstract
The contemporary knowledge society encompasses actors from the public, non-profit private, for-profit private and informal sectors. This paper investigates three types of public-private partnerships (PPP) from the perspective of Systems of Innovation (SoI) as it applies to developing countries: the first type as the public and non-profit private partnership; the second as the public and for-profit private partnership; and the third as the tripartite partnership of the public, non-profit private and for-profit private sectors. In the first type of partnership, stakeholders usually advocate pro-poor and pro-environmental innovation, and in the second type these goals may be overlooked by an emphasis on pro-market innovation. However, the third type is a marriage of non-profit and profit-oriented innovations for improving food security, reducing poverty and ensuring environmental sustainability. Although the tripartite partnership aims to bridge some of the knowledge divides, its operational principles to deal with the divides are not yet clear. This paper argues that multi-stakeholder deliberation on 'dialectical divides' such as flexible and rigid working styles, institutional and competitive funding, corporate interest and social responsibility, and public and private good nature of knowledge contribute towards a smoother maintenance and, if necessary, natural dissolution of relationships in agricultural research and development.

About the authors

Laxmi Prasad Pant is a PhD Candidate at the School of Environmental Design and Rural Development, University of Guelph, Canada. Currently he is engaged in fieldwork in India and Nepal. His dissertation is entitled, 'Partnerships Beyond Research and Development: Systems of Agricultural Innovation in South Asia'. He holds a M.Sc. (Management of Natural Resources and Sustainable Agriculture) from the Norwegian University of Life Sciences, Norway and a B.Sc. (Agriculture) from the Tribhuban University, Nepal. Laxmi has worked in both public and non-profit private sectors. He worked with the Ministry of Agriculture and Cooperatives in Nepal as a Horticulture Development Officer, and with the Nepalese NGOs as a consultant and a research intern.
Laxmi Prasad Pant, School of Environmental Design and Rural Development, University of Guelph, Ontario N1G 2W1, Canada. Email: lpant@uoguelph.ca

Helen Hambly Odame is an Associate Professor at the School of Environmental Design and Rural Development, University of Guelph, Canada. She joined the university after eight years with the International Services for National Agricultural Research (ISNAR) in The Hague, and the International Development Centre (IDRC) of Canada. She teaches courses on communication for social and environmental change, non-formal education and rural capacity development, and leads an action research project entitled 'Linking Agricultural Research and Rural Radio in Africa (LARRRA)'.
Helen Hambly Odame, School of Environmental Design and Rural Development, University of Guelph, Ontario N1G 2W1, Canada. Email: hhambly@uoguelph.ca