Effective Knowledge Management and Organisational Learning in the Context of Sustainable Development

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Abstract: The aim of this paper is to explore how Knowledge Management (KM) and learning can be instrumental for governments' policy making and implementation, and to analyse how KM with the consideration of local culture and a bottom-up approach can increase its effectiveness. The paper is composed of three main sections: first, a literature review to discuss knowledge and learning and ways it can be managed within an organisation; second, a case study on the KM strategy to achieve the Millennium Development Goals 4 and 5 relating to child and maternal health in Pakistan with highlights on the role played by the Lady Health Workers in KM; third, key findings, such as institutional arrangements for and social dimensions of KM, the importance of knowledge creation with a bottom-up approach, and people's ability to transform tacit knowledge into explicit knowledge for it to be managed and to facilitate policy implementation is provided in the conclusion.

Keywords: knowledge management & organisational learning, MDGs and SDGs, Pakistan, lady health workers, a bottom-up approach, sustainable development.

> *"By working together, we can reinvent government in ways that matter to ordinary people everywhere."* – Ban Ki-Moon (UN, 2015-a, p. 75)

1. Introduction

The inter-connectivity of the world has made knowledge management (KM) essential for all sectors, to survive and to thrive in today's fast changing business environment. For the public sector, the development of a nation will largely be defined by the capacity of its government to connect 'dots' when making and implementing policies, as issues, such as poverty, hunger, health, education, gender, water, energy, jobs, industry, inequality, cities, consumption, climate, ocean, land, governance, are interlinked.

The public sector when making policies for national development needs to recognise the interlinkages between different issues. For example, to increase economic growth, policy makers must take into account social needs, and at the same time address climate change and protect the planet (UN, 2016-b). KM, therefore, is required for government officials from different ministries and levels to learn from each other and connect "dots" for joint planning and implementation, horizontally at central governmental level, and vertically from national to local level. These multiple ways of KM are crucial in the 21st century, particularly for the implementation of internationally agreed development agendas, as they are cross-cutting and require policy coherence and local action for achievement.

The year 2015 witnessed the adoption of a series of important, inter-connected multilateral agreements: the Sendai Framework for Disaster Risk Reduction, the Addis Ababa Action Agenda, the 2030 Agenda for Sustainable Development, and the Paris Agreement on climate change (UN, 2016-a). Achieving these internationally agreed agendas had taken years of negotiation and consensus-building by States. After their adoption, the real work began. All States collectively share the responsibility to turn their commitments into actions for their achievement within the given deadlines.

For instance, for the implementation of the 2030 Agenda and its 17 Sustainable Development Goals (SDGs), efforts invested by governments at the beginning of the process are crucial (Stuart et al, 2016). The longer governments take to identify challenges, develop a strategy and associated action plans, the harder it will be to achieve the 2030 Agenda. Among efforts to be made, effective governance which leads to policy coherence and inter-ministerial collaboration horizontally and across administrative levels vertically is fundamental, as "[t]here has to be explicit recognition of the interlinkages between economic, social and environmental challenges, and an institutional set-up that does not make policy in silos" (ibid., p. 8).

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For example, to achieve the 2030 Agenda and its associated SDGs, multi-sectoral joint efforts are required to realise sustainable development. It is, therefore, necessary to consider ways that KM can be supported by appropriate institutional arrangements and enabled by people-based factors to facilitate learning and transforming political commitments into reality.

The aim of this paper is to explore how KM and learning can be instrumental for governments' policy implementation. Three main sections will follow this introduction.

First, a literature review will discuss knowledge and learning, and ways it can be managed within an organisation. It will provide a brief overview on institutional arrangements and KM factors, and how they affect KM and learning for policy outcomes. Second, the KM strategy for the implementation of Millennium Development Goals (MDGs) 4 (to reduce child mortality) and 5 (to improve maternal health) in Pakistan will serve as a case study to discuss its strengths and weaknesses in respect of the key factors identified in the literature review. Third, in the conclusion, key points as findings from the case study will be provided. Institutional arrangements for and social dimensions of KM, the importance of knowledge creation with a bottom-up approach, and people's ability to transform tacit knowledge into explicit knowledge will be highlighted.

2. Knowledge management and learning – a literature review

In the 21st century, technological development has facilitated rapid information sharing through multi-media, and consequently accelerated the change in all sectors. An organisation that values the role of human knowledge and learning for change adaptation will invest in KM, through both internal and external learning, to develop organisational effectiveness (Serrat, 2009). This is particularly important for the public sector, as its organisations are knowledge-intensive and the characteristic of most of them is having knowledge as one of their core products for the public (Willem and Buelens, 2007).

So, what is knowledge and how should it be managed for learning to be effective, when it applies to the public sector to facilitate their policy implementation in the context of sustainable development?

Knowledge

Applying knowledge and KM to increase organisational performance has drawn attention from all sectors. In a highly competitive business world – including in the public sector due to competition for budget allocation – for organisations to remain relevant and thrive, it is necessary to capture and manage knowledge embedded in the organisation (Lee and Choi, 2003; Ichijo and Nonaka, 1998). Definitions of knowledge that scholars provided may vary but most of them are in line with the definition provided by the Oxford living dictionaries: "1) facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject; and 2) awareness or familiarity gained by experience of a fact or situation" (Oxford, n.d.). The first definition refers mostly to explicit knowledge, and the second to tacit knowledge. This distinction has been broadly accepted by scholars (Polanyi, 1962, 1966).

Tacit knowledge concerns 'know how' and is considered 'sticky' as it is rooted in context and hard to be expressed and transferred; whereas explicit knowledge is more about content and concerns 'know what' and is assumed to be 'leaky' as it can be easily articulated and spread (Tagliaventi et al., 2010). Brown and Duguid (2001, p.332) suggest that "[w]hile explicit knowledge can be acquired and transferred by means of rules and norms, tacit knowledge is acquired and transmitted through the sharing of practices, i.e., through the full performance of a task, a job, or a profession". Explicit knowledge is also considered easier to manage as often it links less to the context, comparing to tacit knowledge, so does not require its target audience to understand the larger system for its application (ibid.). In the case that knowledge requires multi-sectoral collaboration for its creation and transfer, KM becomes more complex as increased number of factors can enable or hinder its effectiveness (Andrews, 2010).

For knowledge to be managed, appropriate institutional arrangements are required (TRF, 2011). Beechler and Bird (1999) see that the effectiveness of organisational learning is defined by the efficiency of KM systems, processes and structures (as cited by Alavi et al., 2010). Whereas other scholars see the social factors within an organisation, such as people, culture and leadership, can greatly impact KM's realisation (Lee and Choi, 2003;

Garvin et al., 2008). This brings us to explore further KM facilitators in terms of institutional arrangements and people-based enablers.

Institutional arrangements for KM: systems, processes, and structures

For knowledge to be managed, it is necessary to have **a knowledge system** so knowledge can be consistently generated and shared for learning to keep members close to the heart of operations. When knowledge is managed by an organisation as a whole, the organisation can be regarded as a knowledge system. The system can then operate knowledge in five steps: 1) construction/creation, 2) organisation, 3) storage/retrieval, 4) distribution, and 5) application (Pentland, 1995). These steps are often non-linear and concurrent, and need to be managed in a consistent manner (Lee and Choi, 2003).

Construction implies the creation of knowledge that is new to the organisation or its user community collectively. Knowledge then is organised to relate or integrated to existing knowledge, classified, and stored for institutional memory. With proper storage, knowledge, when needed, can then be retrieved, distributed, and communicated to users to facilitate organisational learning and support adaption of knowledge to the organisation. Once learning takes place and knowledge is applied in practice, it can enable the organisation to innovate and perform better and ensure its long-term success (Alavi et al., 2010, 2014). These five steps can be facilitated by computer-based information systems, paper-based systems – which is less and less, but still in use – and face-to-face social interaction (ibid.).

The above five steps considered by Pentland (1995) on knowledge systems are more appropriate for managing explicit knowledge. However, he also suggests tacit knowledge such as through social interaction, direct involvement, and reflective conversation as means to increase understanding. His suggestion is limited in scope but draws attention to the question of process, as within the context of KM, knowledge can be regarded as both an object and a process (Tan and Al-Hawamdeh, 2000). For knowledge, as an object, to be captured and applied, it has to go through a knowledge process (Nonaka and Takeuchi, 1995)**.**

A knowledge process is about the process of behaviour and mindset of people involved in KM vis-à-vis knowledge (APO, 2013). Sanchez and Heene (1997) regard knowledge, not only as practical understanding, but also as a learning process that can facilitate operations to deliver results (as cited in Willem and Buelens, 2007). Along the same line, Williams et al., (1998) suggest that knowledge is about the perception viewed from the individual's personal lens, which is part of tacit knowledge (as cited by Fowler and Pryke, 2003). Each individual's education, experience and ability define this lens. Consequently, the capacity to intellectualise tacit knowledge and produce explicit knowledge varies. The knowledge outcome, therefore, depends largely on the degree of the ability of each individual, group, and organisation for KM and learning, both formally and informally (ibid.). Nonaka and Takeuchi suggest a knowledge spiral, which is an active continuous process for KM applying to individuals, groups, and organisations.

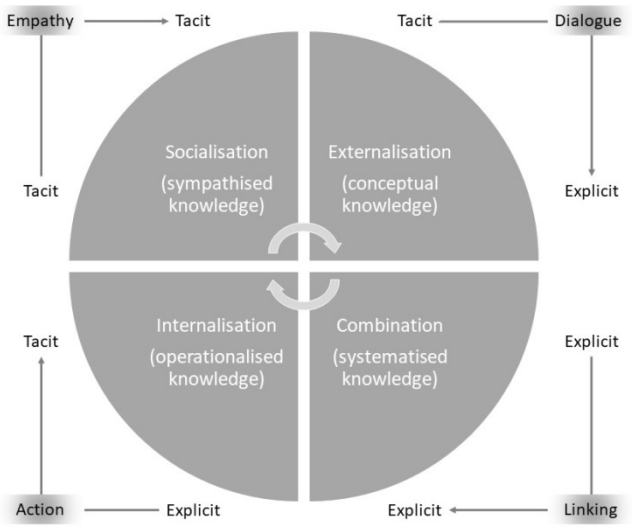

Figure 1: Nonaka and Takeuchi's knowledge spiral, 1995, as cited by Fowler and Pryke, 2003

Graphist: Frederic Zanetta

This spiral process, which is more sophisticated than Pentland's five steps, considers both tacit and explicit knowledge. The process begins with empathy and socialisation that brings up tacit and sympathised knowledge. Further reflection and discussion, individually or in a group, then facilitate externalisation of knowledge for it to become explicit and conceptual knowledge. Then, combining with existing knowledge and linking with other relevant knowledge, it becomes systematised explicit knowledge. After knowledge application involving 'learning by doing', it becomes operational knowledge. The knowledge acquired can then be internalised and turned to tacit knowledge by individuals having applied the knowledge. This spiral cycle can be repeated successively through social interaction between tacit and explicit knowledge. The outcome can be amplified continuously by individuals to a group and to an organisation (Fowler and Pryke, 2003). This amplification by individuals is highlighted by Takeuchi (1998) through knowledge creation by frontline employees, knowledge conversion by middle managers, and knowledge cohesion by top management. In this process, knowledge creation is considered fundamental by many scholars, for instance, Jenkin (2013, p. 97) suggests adding an information foraging step that "captures how individuals engage with sources of data and information as part of the learning process" linking to each individual's initiation of tacit knowledge. Without knowledge creation, there will be no knowledge to manage.

The review and evaluation of KM is crucial in the process. Once knowledge has been processed, organisations need to evaluate and get regular feedback. The level of organisational effectiveness can be an indicator and considered as an important intermediate outcome of KM. Each successful result can further encourage employees to invest more effort in KM. With increased effectiveness, knowledge can be transformed into innovation and enhance organisational performance (Lee and Choi, 2003).

In addition to systems and processes, the third institutional arrangement as facilitator for KM is organisational structure.

Organisational structure can have a profound impact on the information flow and knowledge sharing within an organisation. Organisation theorists, such as Dalton et al. (1980), and Hage and Aiken (1967), consider three principle 'structuring' dimensions – specialisation, formalisation, and centralisation – that influence organisations' decision-making (as cited by Andrews, 2010). For instance, in an organisation, the number of occupational specialisations is a determinant of its division of labour and defines the complexity of its organisational structure (Hage and Aiken, 1967). Where more variety of professional activities is found, there is a greater need for wider participation in the organisational decision-making and for better distribution and utilisation of knowledge by its employees (ibid.).

However, in the public sector, very often the structure and its division of responsibilities into independent professional silos impede KM and organisational learning that is crucial for the integration of policies and service delivery (Bundred, 2006). Furthermore, large organisations are often broken down into several levels from senior management team to the frontline delivery of public services. Without a structure to create an enabling environment for KM, it is challenging to overcome gaps for policies to be learnt and implemented throughout different levels. For example, middle ranking management groups in the organisational structure and their role in knowledge generation, access control and transfer across business units have been recognised (Nonaka and Takeuchi, 1995), but often they are blamed being the cause of ineffective organisational management and KM (Fowler and Pryke, 2003).

Scholars consider that a less formal structure – an organic structure – that is flexible and flat can encourage initiatives from employees and increase the adaptability of the organisation in a dynamic, complex and fast changing world (Andrews, 2010; Alavi et al, 2014; Amiri et al, 2010). By the same token, Burns and Stalker (1961) suggest that an organisational structure with more openness and less formality in its system can promote employees' pro-activeness and interaction, and as a result enhance their problem-solving capacity (as cited by Alavi et al, 2014).

Likewise, delegation of authority and decentralisation can reduce organisational rigidity and can enhance a sense of ownership and generate ideas as it implies the faith of senior managers in the capacity of middle managers to make and execute decisions (Alavi et al, 2014; Andrews, 2010). It also creates trusting relationships at different levels to encourage collaboration. Decentralisation also favours decision-making with a bottom-up approach, as it facilitates the participation of frontline workers and communities, and consequently the inception of their tacit knowledge. Knowledge can be created from their direct involvement,

such as in identification of problems and needs, project development and management. Their participation can further encourage local engagement and ownership for sustainability (UN, 2011).

However, researchers also point out that decentralisation, when uncoordinated, appears to diverge shared values and allow alternatives to emerge, undermining the benefits of a collective vision (Andrews, 2010). In a similar vein, Smith (1985) considers that decentralisation may have a negative impact on the public services provision at the local level when local public authorities are not as efficient as central governments (as cited by UN, 2011; Bossert et al., 2015).

Decentralisation, therefore, presents both an opportunity and a challenge for governments to manage knowledge for policy implementation. Effective KM can provide solutions. Nevertheless, to address challenges, it is necessary to understand public sector's organisational structure, institutions and their effects in their own context, as well as ways to promote cross-boundary thinking.

In a nutshell, facilitated by appropriate KM systems, processes, and structures that an organisation puts in place, intra-organisational cooperation and acceptance of mutual accountability for KM can be increased (Sparrowe et al., 2001). KM enablers, such as people, culture, and leadership, can then be harnessed by such an enabling environment to support learning and contribute to senior managers' decision-making and collective performance (Lee and Choi, 2003; Syed-Ikhsan and Rowland, 2004).

Knowledge management enablers: people, culture, and leadership

As knowledge is people-based, it is suggested that organisations are best viewed as "social community specialising in speed and efficiency in the creation and transfer of knowledge" (Kogut and Zander, 1996, p. 503). To this extent, appropriate KM systems, processes, and structures can intensify the social relations within an organisation for it to capture its social capital and facilitate learning and performing. This social capital according to Putnam (2000) includes "social networks and the norms of reciprocity and trustworthiness that arise from them" (as cited by Andrews, 2010, p. 585). Where social capital flourishes, the closer the linkages are between people and units, so to accelerate the knowledge spiral and enhance collaboration (Nonaka and Takeuchi, 1995). As a result, it generates more frequent interactions between members in different functions or departments and can speed up knowledge sharing and learning within an organisation.

The following section will focus on three human factors – people, culture, and leadership – as essential enablers to increase social capital for effective KM.

People are the agents of KM, as people decide to create and share knowledge, to learn further, and act accordingly (Syed-Ikhsan and Rowland, 2004). It is also people who translate their tacit knowledge into the organisation's explicit knowledge. People are therefore the driving force behind KM. People need to be involved in the design of KM systems and processes and to assume responsibility for its success, for instance, for frontline workers and professionals' commitments to knowledge creation and action generation in knowledge application (Argyris, 1977; Bostrom and Heinen, 1977; Mintrom, 1997). It is, therefore, indispensable to manage people for effective KM. This management needs to include managers at various levels – local line leaders, executive leaders, and internal networkers – to ensure a continuous interactive knowledge process involving both people at the top and frontline levels and organisational learning in an integrated way (Senge, 1996; Takeuchi, 1998).

Training, therefore, needs to be provided to all members of an organisation in a way that they retain the responsibility to share their knowledge through available facilities (computer, paper, face-to-face discussions). The more people are trained, the more positive relationship between users and knowledge systems will be created that leads to enhanced KM (Syed-Ikhsan and Rowland, 2004).

Having **a culture** of sharing knowledge is fundamental for KM. For knowledge sharing to become a continuous process, it requires an organisation culture to promote it consistently so it can become a shared mission among members (Stoddart, 2001). McDermott and O'Dell (2001) define culture as "the shared values, beliefs and practices of the people in the organisation" (as cited by Syed-Ikhsan and Rowland, 2004, p.100). As culture is shaped by people, human interaction and socialisation, such as trust and collaboration, can affect knowledge creation and KM (ibid.). In an organisation where people enjoy trusting relationship and learning becomes a

culture, the likelihood that they share information and for KM to be successful is higher (Garvin et al., 2008). On the contrary, lack of trust can cause withholding information which is especially harmful when cross-functional or intra-organisational joint effort for knowledge creation is required (Lee and Choi. 2003).

To foster a culture to facilitate KM, **leadership** provided by the senior management team can have a positive effect, particularly on the creation of knowledge asset (SyedIkhsan and Rowland, 2004). With clear directives, KM and learning can become a value of the organisation and owned by its members, who in turn can follow the agenda to share knowledge for it to be managed and further disseminated to the right people at the right time (Fenwick and McMillan, 2005). Therefore, leadership plays a decisive role in KM and can increase the effectiveness of knowledge transfer horizontally and vertically.

It is also recognised that leadership can reinforce learning (Garvin et al., 2008). Formal interventions from the top can provide guidance, create more structured groups for KM and learning, and improve organisational performance (Okhuysen and Eisenhardt, 2002). When leaders put emphasis on problem identification, knowledge creation and transfer, and reflective post-evaluations, the KM and learning activities are likely to proliferate across the organisation for it to increase efficiency and creativity and achieve its strategic innovation (Garvin et al., 2008; Crossan et al., 1999). The learning agenda provided by leaders, therefore, is key for KM and learning to happen at multi-levels (individual, group, and organisation) linking to social interactions within the organisation, for example with activities such as intuiting, interpreting, integrating, and institutionalising as suggested in the 4-I framework (Crossan et al., 1999).

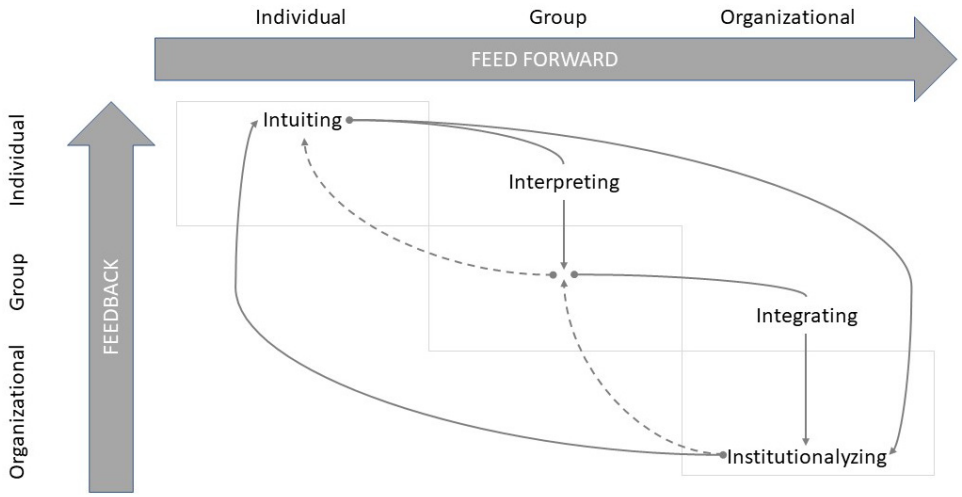

Figure 2: Organisational learning as a dynamic process – 4-I model of an organisational learning (Crossan et al, 1999)

Graphist: Frederic Zanetta

Like the knowledge spiral, the 4-I framework recognises multi-level knowledge processes. While intuiting and integrating occur at the individual level, interpreting and integrating occur at the group level, and integrating and institutionalising occur at the organisational level (ibid.). With clear guidance and demonstration from leaders through their own behaviour for learning, the 4-I can be realised at all levels. It can facilitate for the practice to become a shared value so to tie the organisation together for learning to take place across the organisational structure.

In sum, the above literature review indicates that the level of institutional arrangements such as KM systems, processes, and structures including its three structuring dimensions – specialisation, formalisation and centralisation – defines the degree of opportunity that managers and employees can take initiatives with autonomy for KM and benefit its outcome for their performance. With a decentralised, flexible, less formal, flatter, and uncomplicated structure, the social capital within an organisation could be amplified by its members and a KM enabling culture sustained by leadership.

The following case study will examine the strengths and weaknesses of the KM strategy of Pakistan for the implementation of MDG 4 (to reduce child mortality) and MDG 5 (to improve maternal health). It will also consider the role of tacit knowledge, especially in respect of bottom-up processes for translating tacit knowledge into explicit knowledge.

3. Implementation of MDG 4 and 5 in Pakistan – a case study

In September 2000, the United Nations (UN) Millennium Declaration was adopted by Heads of Government, including Pakistan. Its associated MDGs, to be achieved by 2015, addressed extreme poverty in its various dimensions such as hunger, lack of primary education, gender inequality, child and maternal mortality, diseases, and environmental degradation.

However, development policies and their rhetoric have been challenging to translate into practice. In the implementation of the MDGs from 2001 to 2015, in some countries it took 10 years for governments to turn the goals into institutional commitments (Sarwa, 2015; Lucie et al. 2015). For policies requiring integration, horizontally to include multiple jurisdictions, and vertically through levels of government, the complexity involved increases (UN, 2015-b).

Pakistan's context: health system and facility

Pakistan is administratively divided into four provinces (Punjab, Sindh, Khyber Pakhtunkhaw, and Baluchistan), the federal capital of Islamabad, and seven Federally Administered Tribal Areas. More than 73% of its population (189 million) live in rural areas (WB, 2015). Pakistan ranks in the Human Development Index the 147th out of 188 countries (UNDP, 2016).

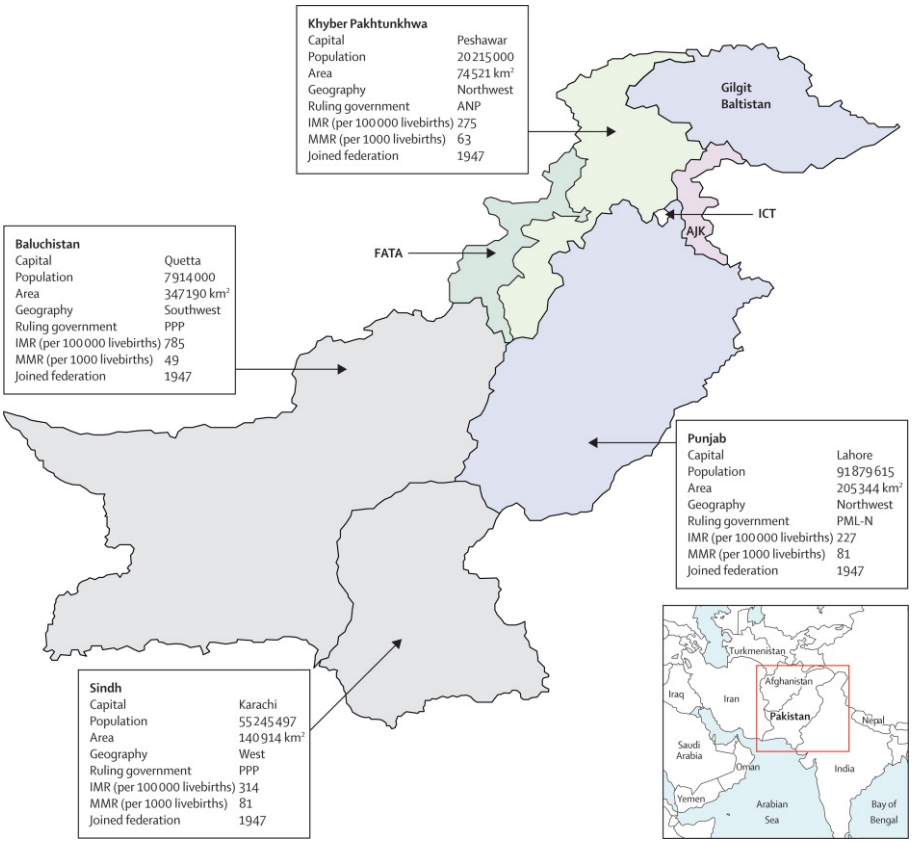

Figure 3: Pakistan's federal structure (ANP=Awami National Party. IMR=infant mortality rate. MMR=maternal mortality ratio. ICT=Islamabad Capital Territory. FATA=Federally Administered Tribal Areas. (Nishtar et al., 2013-a)

Pakistan's health services are ensured by public and private sectors. While the private health facilities tend to serve the affluent, the public sector serves the poor (Shaikh and Hatcher, 2005). The public health services are delivered at federal, provincial and district levels. Its network is composed of rural health centres (RHC), basic

health units (BHU), dispensaries, district and Tehsil headquarters hospitals and allied medical professionals (Wasti and Ahmad, 2017). Health in Pakistan has always received low fiscal support and poor political ownership (Bhutta et al, 2013). The government of Pakistan (GoP) spends only 0.9% of its gross domestic product (GDP) on health, which is low by any standard, even lower than Bangladesh (1.2%) and Sri Lanka (1.4%) (Nishtar et al., 2013-a; Shaikh and Hatcher, 2005). Consequently, the ratio of the availability of health professionals and one hospital bed versus population remains low – "the doctor population ratio stands at 1:997, dentist 1: 10'658, and hospital bed 1: 1'584" (Shaikh and Hatcher, 2005., p. 187).

To increase provision of primary health care and communication between the communities and the health system, the Lady Health Workers (LHWs) programs was launched by the GoP in 1994, and with time, it has gained an international reputation with their grass roots coverage plans (Hafeez et al. 2011). LHWs are recruited according to a well-defined process and selection criteria. After being trained at either a BHU or RHC (or a Tehsil headquarters hospital) for 15 months, they reach out to communities. Each is responsible for approximately 1'000 people's health within a catchment area of 200 houses and are supported directly by the network (ibid.).

Country-wide the GoP has deployed 110'000 LHWs, whose peer status has effectively connected each patient to a government health facility (Zhu et al., 2014). In the areas served by the LHWs, the health indicators are better than the national average (Hafeez et al., 2011)

Pakistan's achievement of the MDG 4 and 5

When the Millennium Declaration was adopted, Pakistan committed to achieving MDGs. For Pakistan, two important targets were MDG 4 and 5, as improving maternal, new born, and child health (MNCH) is essential for its development (Islam, 2004). Precisely, the government committed to:

1. Reducing the under-5 mortality rate: in infant mortality rate from 72 to <55 per 1'000 live births, and the new born mortality rate from 55 to <40 per 1'000 live births; and
2. Reducing the maternal mortality rate from 276 per 100'000 to 140 per 100'000 live births by 2015 (Mahmud et al., 2011).

However, since the government's commitment, the pace to achieve these two goals had been slow. For both MDGs, as assessed by the government, it was unlikely that Pakistan would achieve their targets by 2015 (GoP, 2010). In 2011, the GoP therefore developed a KM strategy and implementation plans, effective from 2011 to 2015, for better making and applying policies and programs to achieve MDG 4 and 5 (MacDonald, n.d.; TRF, 2011). The strategy also set up KM functions in the health sector in selected provinces (Punjab and Khyber Pakhtunkhwa) and identified the KM role of the federal and provincial governments following the devolution of power in 2011.

KM strategy to support the achievement of the MDG 4 and 5 (TFR, 2011) – an analysis

For developing the strategy, the GoP conducted a series of consultations with stakeholders (federal and provincial governments, UN and donor agencies in country, other organisations and the private sector). Identified KM challenges included:

- lack of intermediary channels to link health authorities, workers, to users;
- inability to share broadly information and knowledge;
- absence of comprehensive and accessible information for policy makers and implementers;
- poor utilisation of information and communications technology (ICT) to facilitate KM; and
- need of multiple media support to develop an appropriate KM system suitable to local conditions (ibid.).

To address the challenges, stakeholders agreed on seven principles to develop this particular KM strategy. It should focus on MDG 4 and 5 for improving maternal, neonatal, and child health; be owned and driven by the Provinces; be grounded by institutional realities; be supported by provinces-national, provinces-provinces, and province-districts links; be able to demonstrate results; be mindful to key elements such as target users, organisations, thematic areas, communication mechanisms and tools; and be flexible, practical and tailored to each Province's need (ibid.).

Within this context, the following analysis will firstly consider whether the measures contained in the KM strategy appear to cover the key themes identified in the literature review as being important for KM, namely institutional arrangements (systems, processes, and structures) and social interaction (people, culture, and leadership), so to examine the strengths and limitations of the strategy. Secondly, it will discuss the importance of bottom-up approach, including the involvement of frontline workers at the grass-root level in KM. Thirdly, the role of Lady Health Workers (LHWs) of Pakistan in KM, particularly in translating tacit knowledge to explicit knowledge to create knowledge, will be examined.

1. Institutional arrangements and social enablers

For the implementation of the strategy, the GoP suggested a few measures known as HOTT components – human resources, organisations/institutional arrangement, tools and technologies, thematic areas (TRF, 2011). These measures covered the factors discussed in the literature review, such as institutional arrangements (systems, processes, and structures) and social interaction (people, culture, and leadership). For instance:

- Systems: the strategy included KM into professional competency requirement and supported by human resource management;
- Processes: the strategy assessed existing KM efforts and the outcome supporting the development of the KM strategy for it to maximise its effect in identified thematic areas;
- Review and evaluation: the strategy developed indicators to measure KM's intermediate outcome and progress made in health service delivery;
- Structures: the strategy provided a clear overview on the "know-how" and "know-what" for KM between federal-provinces and province-province;
- People and culture: the strategy suggested as first steps to determine ways people are connected socially and professionally, and provide training to people to understand and apply KM; and
- Leadership: the strategy suggested appointing a senior manager as champion to provide guidance and lead to new organisational structures to facilitate KM.

However, the strategy and its suggested implementation plans appear to put more emphasis on institutional arrangements to increase KM efficiency, for instance, the approach to oversight for the KM hub mechanism at the provincial level, as shown in Figure 4 (TRF, 2011). At this level, a high-level official such as the Health Secretary, should chair a technical working group – the KM Working Group – which would be convened by the Director of the Health Sector Reform Unit and serviced by relevant health units. It would "promote and oversee the implementation of systematic processes for the collection, analysis, expert review and communication of information and knowledge for achieving MDGs 4 and 5 in the Province" (TRF, 2011, p. 29).

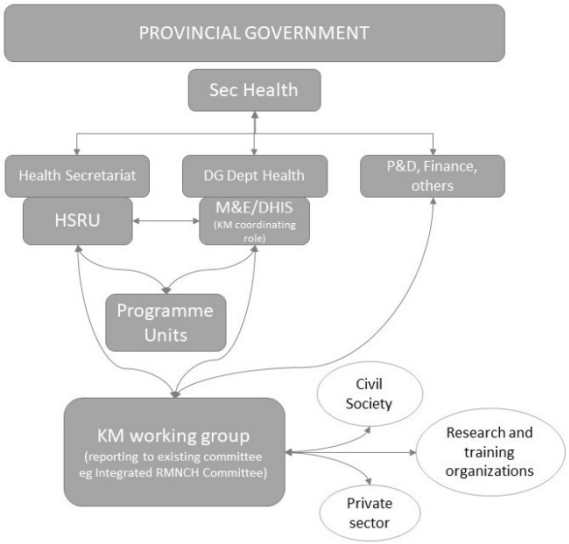

Figure 4: Approach to oversight for the KM hub mechanism at the provincial level, Pakistan

Graphist : Frederic Zanetta

This hub model and the strategy did set up a structure to involve not only key stakeholders internally but also externally including relevant UN agencies and other organisations, and provide an idea on knowledge flow, but only with managers as the target (TRF, 2011). The involvement of individuals at lower levels was not considered. Although the strategy highlighted the need for understanding ways people connect as one of the first steps to introduce KM, it did not provide guidance to strengthen social enablers, such as through people, culture, leadership, and the creation of an environment in which trust can flourish. Elements relating to the application of the knowledge spiral and the 4-I framework, as discussed before, were completely missing in its implementation plans. As a result, the expected outputs of the strategy were limited to focusing on improved organisational oversight, enhanced KM structure, and tools. It did not consider improved social enablers for KM and better cohesion of health policies and collaboration at federal and provincial levels for enhanced health outcome at the district and community levels.

2. Bottom-up approach

Despite the political will demonstrated through the 2009 Karachi Declaration for concerted effort at federal, provincial and district levels to improve health of mothers and children and family planning, the devolution of power from federal government to the provinces in Pakistan under the 18th Constitutional Amendment (effective 1 July 2011) had complicated the development and implementation of the KM strategy, as each province was then expected to develop its own population and health policy, and produce results (JSI, 2009; Nishtar et al., 2013-a).

With this power devolution, most of the responsibilities listed in the constitution, as well as the majority of preventive health programmes, were transferred to the provinces (TRF, 2011). The strategy, made after assessments at federal and provincial levels, defined KM functions and clear division of tasks. It stated that at the federal level, its KM responsibility was to collect and disseminate best practices, while at the provincial level, its responsibility was for routine data collection, its synthesis and communication (ibid.).

However, in this KM strategy, the structure was set in a formal way and the KM target audience was at decision-maker and manager's levels. The institutional arrangements as demonstrated in the hub model also bypassed the involvement of health workers at the levels lower than provincial level managers. This formal approach and focus on the manager's level could be explained by "the overall conservative feudal character of the broader society" of Pakistan as men occupy mostly managers or health policy makers' positions (Islam, 2004, p. 4-5). It could have led to the non-inclusion of women health workers in KM because of their lack of access to decision-making processes and their lower social-economic status, and consequently "reinforce[d] the gender bias of the health and care system" and had a negative impact on KM (Islam, 2004, p.5).

For instance, and surprisingly, the role of Lady Health Workers (LHWs) was barely mentioned in the KM strategy. The step of generating knowledge in the system by frontline health workers with a bottom-up approach was missing. Despite the challenges such as the lack of linkage between health authorities, workers and users and the inability to share information were identified, the strategy did not address and propose solutions. The KM systems, processes and structures were not made to facilitate knowledge creation. The important role of frontline health workers in knowledge creation for sharing and knowledge application after learning was ignored.

3. Translating tacit knowledge into explicit knowledge for knowledge creation

As discussed above, KM becomes complex where a greater variety of professional specialisations is found, as there is a greater need for wider participation in KM. For KM to improve maternal and child health, it needs to capture social issues as determinants of health, such as poverty, malnutrition, gender inequality, illiteracy etc. (Hafeez et al., 2011). In Pakistan, the lower status of women in the country is reflected in the poor provision of economic opportunities, nutritional deficit in women, and insufficient visits to hospitals for prenatal check-ups (Islam, 2004). These issues need to be considered in KM to provide a better picture to improve health. Thus, the involvement of frontline health workers to collect information and create knowledge is required.

Under the 18th Constitutional Amendment, the districts have been given administrative and financial autonomy in almost all sectors, including health (Shaikh and Hatcher, 2005). At the community level, LHWs have been "agents of change" by providing integrated preventive and curative health services to their neighbours, which is particularly needed by women and children in poor and underserved areas and for the achievement of the MDG 4 and 5 (Zhu et al., 2014, p. 3; Hafeez et al., 2011).

The LHW network, with its community-based presence and understanding of the local customs and languages, has been appreciated and enabled LHWs to play a catalyst role to bring neighbours closer (Hafeez et al. 2011). The social capital that they generate at the community level and its potential should not be neglected for KM. With appropriate training and recognition of their role and with improved social-economic status, LHWs can actively seek out information as required, forage information by translating tacit knowledge into explicit knowledge (Jenkin, 2013). The creation of knowledge in this way could provide a better picture of health to managers as it covers areas of social determinants of health and solutions could be found with an integrated approach.

In fact, LHWs have been the agent and starting point at the individual and group levels for KM, and for knowledge application. They have been performing intuiting, interpreting, and integrating – the first three steps of the 4-I framework of organisational learning (Crossan et al., 1999). With training, LHWs could, by interpreting the observations and experiences acquired from their family visits, to create required explicit knowledge from tacit knowledge. This knowledge could then be transferred to Lady Health Supervisors and then as a group, with interpreting and integrating, to generate knowledge at the community and district levels. Knowledge could then be forwarded for provincial level managers' collection, conversion, monitoring and evaluation. Supported by an adequate KM system, knowledge could be institutionalised to inform policy makers of the GoP. As the performance of LHWs is critical for the provision of essential health services to the community in Pakistan, the GoP might benefit from further investment in LHWs' development to enhance their capacity, so that relevant knowledge could be generated, managed, and applied for health improvement (Islam, 2004; Hafeez et al., 2011; Sabih et al., 2010).

4. Conclusion

For KM to support policy making and implementation, knowledge needs first to be created, including through the transformation of tacit knowledge into explicit knowledge. It needs to involve trained community-based workers so their inputs into KM systems and outputs for results become meaningful. Pakistan's KM strategy for achieving MDG 4 and 5 was made with managers as their target audience. Though managers could increase the likelihood of KM through fostering a knowledge sharing culture, they would need knowledge to be generated by frontline health workers. The case study demonstrates the value of LHWs in knowledge creation, not only in health but also in areas of social determinants of health. LHWs, with training, could be equipped with necessary skills, as indicated in the 4-I Framework, to take note of their findings and translate the information into explicit knowledge for sharing and application by others.

The optimisation of the LHW network and LHWs' role for them to become a key for KM could promote improvement of health and related social development at local communities (Nishtar et al, 2013-b; Bhutta et al., 2013).

The GoP's investment to enhance LHWs would need to combine with efforts to "better focus on equity, community participation, and inter-sectoral action on social determinants of health", so that the LHW's could become an integral component of district health system operating in the framework of Primary Health Care of Pakistan to sustain its benefits (Hafeez et al., 2011, p. 214). A well performing district health system can then empower health policy implementation at provincial and national levels (Sabih et al., 2010).

In conclusion, users and managers of knowledge need to jointly assess the knowledge requirements of the organisation to develop appropriate systems, processes, and organisational structures and to put them in place. It is necessary to identify who are the knowledge holders (people) in different departments at various levels and their ways to connect. It is also imperative to understand in what kind of environment (culture) the knowledge is to be shared and with whom, who leads and how (leadership), and what kind of outcome can be expected at different KM stages to facilitate evaluation. Solutions identified and supported by leaders could enhance the KM outcome. Special attention should be paid to knowledge creators, such as frontline workers who can transform tacit knowledge into explicit knowledge for bottom-up sharing and organisational learning.

The same approach applies to KM in the context of sustainable development, for example to achieve SDGs. For cross-sectoral policies to be implemented, relevant knowledge needs to be first created and shared by individuals or groups. The sharing could be challenging in the public sector due to the hierarchical and

bureaucratic setting of government agencies (Liebowitz and Chen, 2003). However, with appropriate institutional arrangements and commitment of employees and leadership to foster an enabling culture, knowledge, as well as know-how and skills lodged in an organisation, can be better captured and shared for learning and innovation (Andrews, 2010). The involvement from frontline workers to government officials could facilitate KM operations horizontally and vertically in a collaborative culture. The knowledge provided could then support government's policy making and implementation, for instance to achieve sustainable development in an integrated way.

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