A Knowledge Management Framework for Sustainable Rural Development: the case of Gilgit-Baltistan, Pakistan

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Abstract - *Some 50% of the people in the world live in rural areas. The need for knowledge of how to improve living conditions is well documented. Knowledge on how to improve living conditions in rural areas and elsewhere is continuously being developed by researchers and practitioners around the world. People in rural areas, in particular, would certainly benefit from being able to share relevant knowledge with each other, as well as with stakeholders (e.g. researchers) and other organizations (e.g. NGOs). Central to knowledge management is the idea of knowledge sharing. This study aims to present a framework for knowledge management in sustainable rural development. The study is interpretive and presents a framework of knowledge management system for sustainable rural development.*

Keywords: knowledge management, requirement analysis, framework, knowledge society, rural development,

1 Introduction

The need for knowledge of how to improve living conditions is well documented [18]. In response to this need, new knowledge of how to improve living conditions in rural areas and elsewhere is continuously being developed by researchers and practitioners around the world. People in rural areas, in particular, would certainly benefit from being able to share relevant knowledge with each other, as well as with stakeholders (e.g. researchers) and other organizations (e.g. NGOs). Central to knowledge management (KM) is the idea of knowledge sharing. The significance of KM in sustainable development has been described by several researchers. According to wong [19] KM provides a good foundation for sustainable development. KM is also critical for innovation, prioritization and the efficient use of resources [15].

In this paper we discuss how to apply a KM approach in order to take advantage of knowledge, experiences and good examples of sustainable rural development to improve life for the people of remote rural regions. We perceive knowledge management as the process of "continually managing knowledge of all kinds to meet existing and emerging needs, to identify and exploit existing and acquired knowledge assets and to develop new opportunities." [16] When we use the term development we refer to human development. "Human development is about creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interest" [19]. From our perspective in this context of rural development, sustainability implies the use of methods, systems and materials that will not deplete resources or harm natural cycles [10]. Thus, we hypothesize that the use of KM to discover, capture, share, and apply knowledge about rural development activities can support sustainable development. A knowledge-based society and knowledge-sharing environment can make the development process sustainable and the goals of that development process achievable. The long-term goal is to contribute to a better life for vulnerable and exposed people in rural areas.

This study examines the case of the region of Gilgit-Baltistan in Pakistan in order to develop a framework for knowledge sharing for sustainable rural development. The Gilgit-Baltistan region of Pakistan is a rural region. Geographically the region is situated in the north of Pakistan (approximately 35-36o North and 74-75o East) and surrounded by the world's greatest and highest mountain ranges: the Himalayas, Karakorum, and the Hindu Kush. Economically, this area is poor and this region has been the subject of a rural development process by numerous NGOs, international development agencies, and the local government of Gilgit-Baltistan in Pakistan. For the last twenty years, the AKRSP (Aga Khan Rural Support Program) has also sought to contribute to the reduction of poverty in the region [23]. The research question for this paper is: How can knowledge management contribute to sustainable rural development? In addition, the specific objectives are to: specify the knowledge needs of a repository and knowledge sharing.

1.1 Knowledge management frameworks for rural development:

A number of knowledge management development frameworks exist in literature. In his study, Heisig found 160 frameworks [2]. In this paper, we present 10 selected frameworks that are specifically related to rural development. Different components of the framework have been selected in order to put forward one specific framework that is appropriate for rural contexts such as Gilgit-Baltistan, Pakistan. The selection of frameworks from the literature study is presented in Table 1, below.

Table 1

Frameworks	Purpose/Objective	Type of Knowledge	Technology used	Knowledge beneficiary
[13]	Integrating resources to help farmers	Agriculture and market.	Research and training	Local community, researchers
[17]	Integration of traditional and scientific knowledge	Traditional & scientific,	World digital graphic mental, information portal website,	Researchers
[2]	knowledge networks	Implicit ,explicit	Mobile phone, email, radio,	Local/ rural
[4]	management areasl development	Economical, ecological,	Knowledge base	National, regional,
[5]	management knowledge-based DSS	Agriculture based	Data base, knowledge base	Farmers
[3]	Rural education resource	Rural education	IP network, satellite network,	Rural community
[6]	Regional viable system for agriculture	Agriculture	Databases, knowledge pools	Rural community,
[9]	knowledge management platform ASEAN countries	Rural energy service	Relational database, search algorithm, knowledge servers,	ASEAN countries,
[11]	knowledge sharing centre in Dominican republic	Community knowledge	Email, digital identities	Local community
[7]	Rural business decision support system	Live stock based rural knowledge	Knowledge base- expert system-	Farmers

The framework inventory mainly contributes by offering techniques and strategies that allow rural development knowledge to be shared. It also verifies the categorization of the beneficiaries and of rural development knowledge.

2 Methodology

This work is an interpretive qualitative study [20] that focuses on how to use KM for sustainable rural development. After an initial literature review the study was carried out in two phases. One phase consisted of an empirical study to specify stakeholders and knowledge resources. The other phase consisted of a selection of relevant frameworks and concepts carried out in order to find a relevant KM approach to realize a KMS. Phase one takes aspects from requirements analysis as point of departure, while phase two searches for KM approaches that claims to contribute to rural development. The first Phase started with a field study in the region of Gilgit-Baltistan in Pakistan. The field study was carried out over a period of 21 days, during which interviews were conducted in this specific region. The study was designed using a traditional method of stakeholder-driven requirement elicitation put forward by Lamsweerde [14]. In parallel with the requirement analysis we carried out an inventory of relevant approaches to the design of knowledge management frameworks. Data bases used were: ACM Digital Library, Elin@orebro, and Google Scholar. Search words were “knowledge management system”, “rural development”, “sustainable development”, “development”, and “framework”, in different combinations. A review of abstracts and conclusions elicited ten articles on the design of frameworks in knowledge management connected to rural development. The articles were selected due to their close connection to knowledge management and rural development. The three main elements, that were considered when selecting frameworks, were the same as we used as for the empirical study. A data matrix was used for analyzing the concepts of the selected frameworks [21]. As noted in [12] the use of ideas in the literature is to justify the particular approach to the topic. Ten frameworks were selected. Empirical information was gathered in line with initial information requirements for knowledge management. This was then related to the selected frameworks outlined in the literature study and described in the sections that follow. Results are presented with the findings from the empirical study and framework for knowledge sharing for sustainable rural development.

3 Knowledge on development activities

In order to develop a knowledge repository, the primary requirement is to acquire knowledge from stakeholders. Initially, information about development activities in the

region was collected and categorized. The interviewed organizations were categorized into four main stakeholder groups and analyzed with regards to the knowledge beneficiaries. The interviewed stakeholders had specific knowledge with respect to their development practices. Their practices concerned animal husbandry, social welfare, safe drinking water, tree planting, glacier protection, wildlife preservation, building health care units, school building, teacher training, culture preservation, tourism promotion, building ICT centers, gender development, and more. Knowledge was categorized on the basis of stakeholders' knowledge resources and needs relevant for rural development, which is presented below. The knowledge is available in different forms. The local government's planning and development department has, for example, knowledge on funding and infrastructural development of the region in paper format. The LSO (local support organization) and local population have information on the agriculture sector. AKRSP (Aga Khan Rural support program) has 25-years' worth of development records, kept both in paper and digital formats.

3.1 Technical conditions and ICT infrastructure

The ICT infrastructure represents the conditions for any ICT-based initiative such as a KMS. The initiatives are candidates for incorporation in the KMS and they demonstrate that ICT based knowledge exists even in remote rural regions. The region has internet connectivity some of the NGOs have relatively fast Internet connection. More recently few Mobile phone companies have started their operation in the region. There exist ICT-based initiatives such as AKRSP has a project in collaboration with Telenor Pakistan. The project examines e-market access for farmers in the remote valleys. Another recent project is a digital resource centre, which stores the current documentation of organizational activities. AKRSP has also initiated a 3D program (democracy, dialogue and development) to study local governance in terms of the initiation of dialogue culture. AKCSP (Aga khan Cultural service Pakistan) has initiated a project with support from the Government of Norway to restore and rehabilitate historic landmarks and places. KADO (Karakuram area development organization) has started a business incubation project for website development for small entrepreneurs. An e-schooling concept has been introduced and four Internet cafés have been established. The main requirement for the knowledge repository is to utilize all these kinds of resources offered by individual organizations.

3.2 Proposed framework for knowledge sharing of sustainable rural development activities

We present a framework for knowledge management in rural development based on literature study and the empirical findings. The description of the KMS is compiled from selected frameworks for rural development. The stakeholder categorization and knowledge content are both derived from the empirical study. In the proposed framework we claim that the sustainability of rural development can be achieved through a knowledge society in which knowledge of the rural development process is shared among all relevant stakeholders. Knowledge society and sustainability occur when the local population can independently inform themselves about the rural development process and activities. In the proposed framework the process starts with the stakeholders. The stakeholders are local government, local population, academia, NGO's, civil society and donor agencies. The second layer consists of rural development activities including ICT and infrastructure. The third is KM system that consist of creating/capturing knowledge, knowledge storage and sharing/application of knowledge. The processes and technology are adapted from the 10 selected frameworks. In our framework, the created knowledge was then captured, converted and stored in different digital formats using the relevant ICT tools and technology. The framework shows the technologies that can be used to share knowledge; these include the Internet and intranet web portals, as well as mobile and smart phones, and other formats. Different communication channels can also be used, such as TV programs, to show documentaries. The final process on the topmost layer of the framework relates to the sustainability of rural development. Our main claim about this process is that when shared knowledge is applied further on in the rural development process, it leads to the sustainability of the whole rural development process. The key points may come into play as Knowledge is important for development [22]. A sustainable knowledge society is composed of three elements: economic, environmental and social development [2]. A knowledge society can make the development process achievable.

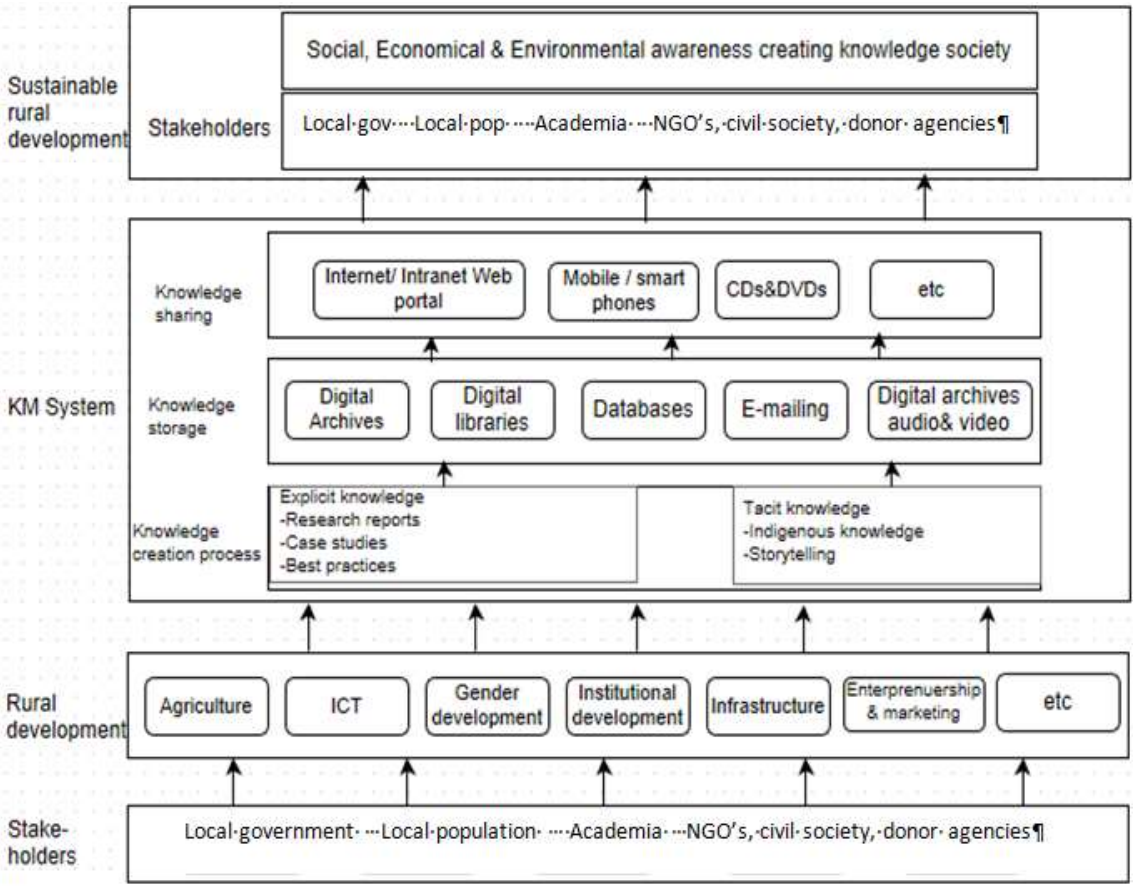

Figure1: KMS framework for sustainable rural development

4 Conclusions

Knowledge is crucial for any kind of development. Sustainability is composed of three main areas: social development, economic development and environmental development. Diverting rural development towards the path of sustainability implies a reliance on knowledge of the natural process, natural resources and the inter-relations between social and ecological systems. A knowledge society can also make the rural development process achievable. In this context, the achievability of the rural development process and its sustainability relies on knowledge. Thus, we designed a knowledge management framework in order that knowledge can be used to develop the sustainability of the rural development process in the case of GilgitBaltistan Pakistan.

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