**Is South Africa in the Fourth Industrial Revolution? Tracing the empowerment of women in rural areas of KwaZulu-Natal from information and knowledge for development perspective. Inaugural Lecture.**

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Abstract

Tracing development through research for scholars in the information and knowledge fields, continues to be a focus, more so in the advent of a new era of development, the Fourth Industrial Revolution (4IR). Building on previous developments, the 4IR is regarded as the intelligent revolution of industry, characterised by a fusion of technologies, enabling innovations with varying levels of speed. The 4IR’s predecessors, the agricultural, industrial, and the information and knowledge revolutions paved a way for development in different categories and sectors, which includes women in rural areas.

The presentation focuses on tracing the empowerment of rural women in South Africa with special reference to information and knowledge. It investigates the status of South Africa in the 4IR. Therefore, this paper:

* Assesses the empowerment levels of rural women by applying related pointers and characteristics of the 4IR.
* Presents the use of information and knowledge for development by rural women, with a view to establishing that South Africa is in the 4IR.

I conclude that South Africa is in the Fourth Industrial Revolution and that even though rural women are still somehow lagging behind, leapfrogging to reap the benefits of the 4IR is feasible for their empowerment.

**Keywords:** Fourth Industrial Revolution, South Africa, information, knowledge, rural women, empowerment.

**Introduction and background**

The role of women, particularly rural women, in the development of communities and societies cannot be overemphasised. A wealth of initiatives and literature, for example Visions, Protocols and Agendas, has addressed and published on rural women empowerment, development and advancement, and discussions in boardrooms have addressed issues of rural women and their empowerment and development as reported in related studies by Jiyane, Mostert, Majanja and Ocholla (2014); Jiyane, Mostert, Majanja and Ocholla (2013); Jiyane and Zawada (2013);Jiyane (2012); Jiyane and Mostert (2010; 2008); Jiyane and Ocholla (2004); Jiyane (2002) among others. However, it appears that taking practical action towards their empowerment and advancement is lacking, drawing the attention of scholars, emerging researchers and governments, as policy-makers. It is thus not surprising to observe an increase in research, talks, summits and plans for action, in many organisations regarding rural women empowerment, development and advancement; especially in the wake of the Fourth Industrial Revolution (4IR).

Throughout history, humankind has been looking for ways to innovate and develop, effective use of information, knowledge, technology and competencies to address emerging challenges, empower themselves and improve their effectiveness is rapidly increasing. This human aspiration has enabled the society or mankind to transform from hunter-gatherers, through agrarian to industrial and information and knowledge societies driving or driven by economic growth, technology and innovation It is reported that modernisation increases women’s empowerment and that the economic development of a nation has a role to play in human development. Several authors have attested that greater economic resources can be linked to increase in emancipative values (Alexander, 2007), such as gender equality, a product of women empowerment (UN Women, 2015). Women’s economic empowerment is essential for full, effective and accelerated implementation of the 2030 Agenda for Sustainable Development. Achieving women’s economic empowerment rights constitute a sustainable development solution. Gleaning from the theory of modernisation, as postulated by Rostow and Rostow (1990), it is possible for humans, including rural women, to get to modernisation, through several layers of development (figure 1).

 Rostow’s Modernization Theory (Adapted from Rostow & Rostow, 1990)

According to this theory, traditional societies, where rural women are mostly found, have to go through certain stages of development, starting from the very low and basic level where they are static and have limited technology and their transition is triggered by external influence. The second level is where the traditional societies assume preconditions for take-off. In this level, physical infrastructure is installed and there is emergence of elites. Of significance in this level is the fact that with infrastructure, agriculture is exploited and commercialised to gain economic benefits. In the next higher level, the traditional societies are ready to take–off, with activities more into manufacturing and a national income, due to investment in manufacturing, that exceeds 10 per cent. Another development at this level is that of different institutions in social, economic and political sectors. The next level sees traditional societies making inroads in international platforms, where they take advantage and exploit trades for their benefits. In this highest level, there is the drive for maturity, which leads to high mass consumption of what is manufactured. This implies that if these stages have all been undergone, the traditional societies, which most rural women are presumably associated with, would have transformed and evolved through modernity and eventually empowerment through information and knowledge society and now the fourth industrial revolution (4IR).

Although Dordick and Wang (1993:8) are of the opinion that the information society was already gleaned in the early writings of observers in Japan, who often referred to a ‘new world’ in which material values were to be replaced by more spiritual values, Martin (1995:2) maintains that the concept of the information society emerged in the 1970s and was rapidly adopted in the 80s.

In 1974, Daniel Bell observed and discussed the drop in the manufacturing and agricultural industries and the rise in services with information as the main component in his book, “*The coming of post-industrial society”,* writing that the post-industrial society was undergoing a transformation and entering the age of the information society (Bell 1974; Webster 1995). Edwin Parker and Mark Porat from Stanford University also confirmed the onset of the information society in 1975 and 1977. This evolution was also confirmed by Toffler (1980), who talks about the ‘third wave’. The author likens the three types of societies to waves, where each wave pushes the older societies and cultures aside. Toffler explains that the first wave is the society after the agrarian revolution that replaced the first hunter-gather cultures, whereas the second wave is the society during the Industrial Revolution, from the late 17th century through to the mid-20th century. According to Toffler, this society was based on mass production, mass distribution, mass consumption, mass education, mass media, mass recreation, and mass entertainment. The third and the last wave, as explained by Toffler (1980), is the post-industrial society which he calls the super-industrial society. Other scholars refer to it as the information age, electronic era, global village, technetronic age, scientific-technological revolution, diversity, knowledge-based production, and the acceleration of change.

Some authors base their definition of the information society on the operational aspect of the concept. For example, Shillinglaw’s (1988:12) definition of the information society is a society in which the majority of the workforce is engaged, not in the production of manufactured goods, but in the processing of information. Likewise Toffler and Toffler (1995) define it as a society where the new premise is the production and creation of knowledge, unlike the tangible resources of the industrial society. In 1995, the Finland Council of State defined the information society as a society that makes extensive use of information networks and information technology (IT), produces large quantities of information and communication products and services, and has a diversified content industry (McColgan 1996).

In related studies (Martin 1995; Nassimbeni 1998; Webster 2002; Lor and Britz 2007), the term ‘information society’ has attracted some criticism due to its ambiguous use in literature. Nassimbeni (1998:154), for example, points out that very few operational definitions of the concept exist, which makes it very difficult to decide whether a country or community has taken strides towards becoming an information society or not.

According to Lor and Britz (2007:392), many authors use the concept ‘information society’ interchangeably with the newer concept of the knowledge society. The opinions given by Nassimbeni (1998), Lor and Britz (2007) and other authors such as Martin (1995) and Webster (2002) are examples of indications that the information society has evolved overtime.

Despite all these arguments, one has to also look at the definition of the concept as presented at the influential World Summit on the Information Society (WSIS) in Geneva in 2003 to establish if the concept’s definition has evolved overtime. According to WSIS (2003), an information society is the following:

* A society in which people interact with technology as an important part of life and social organization to exchange information on a global scale
* A society influenced by the changes taking place in the ICT sector
* The term refers to the new socio-economic and technological paradigm likely to occur as a result of an all-encompassing process of change that is currently taking place
* A society in which advanced technology is used to improve the living and working conditions of all citizens
* The ‘information society’ is a term that has been coined to describe a modern population that is conversant with and reliant upon information and communication technology
* A society where the creation and exchange of information is the predominant social and economic activity
* The acquisition, storage, processing, transmission, distribution and use of information and knowledge (WSIS 2003)

The knowledge society is a more advanced concept than the information society. At the beginning of the 21st century, studies (Drucker 1998; Evers 2000; Smith 2002; Serves et al. 2003; WSIS 2003) were already suggesting that this term (KS) would be replacing the term ‘information society’, but the way that it is used is ambiguous.

According to Lor and Britz (2007:112), a knowledge society is the following:

* A society that operates within the paradigm of the economy of information
* It values human capital as the primary input for production and innovation
* The knowledge society is well connected via modern ICTs to the dematerialized economy and has access to relevant and usable information
* highly sophisticated physical infrastructure underpins this economic model and allows the delivery of material objects that are accessed and manipulated in the dematerialized world of modern ICTs

This definition suggests that there is not much of a difference between these two concepts. Thus, notes Lor and Britz (2007:113), the difference between an information society and a knowledge society is only a ‘shift in emphasis’. Holmner (2008:60) believes that the knowledge society can be regarded as a similar concept to the information society. However according to the author, even though the knowledge society is more advanced than the traditional view of the information society, the two concepts should not be used in isolation. Rather they should function as a conjoined concept, i.e. the information and knowledge society. Therefore, Holmner’s (2008:62) and Jiyane (2012) suggest that the information and knowledge society is defined as follows:

* A society that is reliant upon a sophisticated physical infrastructure for the improvement of everyday living and working conditions
* A society that values the importance of information as a key to economic wealth and prosperity and where there is an increase in information-related activities as well as an enhancement of human intellectual capability
* The information and knowledge society ensures the freedom of information through the use of ICTs
* In such a society, modern technologies are utilized to achieve the interaction and exchange of information between the people’s local knowledge system (tacit knowledge) and global knowledge (explicit knowledge) to create usable, relevant, contextualized content and knowledge
* An information and knowledge society relies on elaborate physical transportation, consisting of roads, trucks, warehouses, railways, airports, harbours, and similar items
* Sophisticated information and communication infrastructure, consisting of telecommunication cables, computers, servers and hosts and internet service providers, is vital to facilitate the exchange and interaction of data, information and knowledge from the community’s local knowledge systems and global knowledge systems
* Within an information and knowledge society, information is regarded as having economic value and can be utilized to promote human development in areas such as health, education, social services and commerce. This would lead to an increase in human intellectual capability and can lead to the improvement of daily working and living conditions.

While aware of ‘leap frogging’ which commonly define our relationship with modern push technologies, I believe that for rural women and humankind generally to embrace the 4IR status, they have to achieve the information and knowledge society status. Holmner (2011) defines the information and knowledge society as a society that is reliant upon a sophisticated physical and ICT infrastructure for the improvement of everyday living and working conditions. The author further states that this is a society that values the importance of information, as a key to economic wealth and prosperity, and where there is an increase in information-related activities, as well as an enhancement of human intellectual capability. The information and knowledge society, she continues, ensures the freedom of information through the use of information and communication technologies. Each of these evolution and shift pulls humankind to the next best stage of being revolutionised. The current revolution is the fourth industrial era which exists because of its predecessors, the first, second and third industrial revolutions. In this era of the 4IR, there is consensus in the global community, in defining the Sustainable Development Goals (SDGs) on the need to achieve gender equality by empowering women right from the grassroots (UN Women, 2015).

**What is fourth industrial revolution?**

According to the World Economic Forum, the 4IR is a revolutionary change, which is characterised by ubiquitous and mobile internet, cheaper, small and stronger sensors, and artificial and machine learning (Schwab, 2017). It is a revolutionary change that occurs when information technology (IT) proliferates in all industries: primary, secondary and tertiary (Lee et al, 2018: 3). Schiuma (2017) view the Fourth Industrial Revolution as the development and application of techno-human smart systems capable of improving the efficiency and productivity of production systems, as well as supporting a general improvement in the quality of life of individuals and communities. Similarly, it refers to the development, deployment and exploitation of holistic smart systems that integrate technology, humanity and biology so that they can deal with old and new socio-economic and environmental challenges, taking into account the specific characteristics of the context at hand (Lee et al., 2017). The relationship between the developments is provided in Figure 2.



**Fig. 2: Developments from first revolution to fourth revolution**

**Source: Department of Telecommunications and Postal Services**

As presented in Figure 2

* The first industrial revolution used water and steam engines to manufacture goods.
* The second industrial revolution manufactured goods using some infrastructure such as water, gas, electricity. The road infrastructure and telegraph as means of communication were prime.
* The third industrial revolution focused on the paradigm shift from the conventional fossil fuel-based society to the renewable energy- or alternative energy society. The use of electronics, telephones and the introduction of personal computers were core of development.
* The fourth industrial revolution, the current revolution, one sees connectivity on mobile, connectivity through mobile, cloud and smart devices.

In all these developmental stages, the complexity of living increasesand humankind has to evolve to be relevant.

**Assessing the empowerment levels of rural women by applying related pointers and characteristics of the 4IR**

When recognising at the characteristics of the previous revolution, the information and knowledge revolution, which Schwab’s and other authors, attest to, there is a thin marginal line. Physical infrastructure, spatial and technological, economic, social, political, knowledge, cultural identifiers (Holmner, 2008) offer a space to measure what South Africa has that could support and promote information access and use as well as the application of the knowledge obtained, so as to be relevant in relation to the level of other countries. These identifiers present the level of growth of the era that rural women should be in terms of their empowerment.

The 4IR has these characteristics to offer as grounds for rural women empowerment and advancement:

* Fusion of technologies- smart phones, for easy communication among themselves and with others. The use of smart phones ensures connectivity anywhere and anytime.
* Mobile internet may allow rural women to search and access the information they need and receive real time results.
* Artificial machines have the power to create production in an efficient and effective way and rural communities can benefit from these as long as the infrastructure allows it.
* Diverse technologies allow the choice of use. Rural women can choose to access any affordable and usable technologies for their need.
* Connection to new markets based on IT in all industries is possible. Connectivity and the use of smart technologies shapes customers’ expectation and increases quality of products and services. It opens innovation that is collaborative and ensures professional competencies is initiated and nourished through transfer of skills. In terms of rural women, with a lot of their work being cooperatives in nature, for instance agriculture, and other entrepreneurship aspects, a space for collaborative innovation and increased competencies, will be ensured.
* New systems for distribution of products that rural women either create or work with is efficient in a space with interconnected and effective systems.
* Through new technologies, redistribution and centralisation of power is possible. That is nowadays witnessed in political engagements and drives in many countries, including in South Africa’s recent elections campaigns. Connection with the masses and delivering the political manifestos in big screens ensures that citizens will engage with each other, with party leaders and with governments. These influence the political sector and the government to adjust their systems of engagement and policies, knowing that more citizens can voice out and efficiently influence governments’ activities. Rural women can enter into this space and make their voices heard on the issues that involve them on daily basis. They could, through technologies and smart devices usage, collaborate, engage, discuss and advise accordingly, in an efficient way, and learn from fellow women in other places.

The 4IR, combining technologies, builds on other revolutions, from simple digitation to innovation. This feature of the 4IR enables companies and individuals to innovate their business models. Rural women, and the activities they perform for living, can be enhanced by technologies in the 4IR. For example, rurality addresses the aspect of having a space to practice agriculture and other emerging formal businesses. Rural women can benefit from innovative ways of practising agriculture and running small informal businesses, which will in turn grow the economy. By understanding and using digital technologies in agriculture, they will learn about food consumption, food security and other innovative ways to produce, transport produce, and put price labels on them. This way, efficiency will lead to increase in productivity and multiple innovations. For example, if they use digital technologies and experience increased productivity, there will be increased in income, followed by the opportunity to apply smart ways of managing their cash, which is financial innovation enabled by smart technologies in the 4IR.

While in agricultural aspects, which most rural women practice, the issue of climate change cannot be ignored. This state of environment causes damage in most natural and agricultural sectors from which most rural women benefit, directly or indirectly. With smart technologies of the 4IR, rural women can learn to apply them to curb the effects of the disturbances in weather conditions due to climate change. They can apply easy share, transfer, disseminate and use information among themselves and with the agricultural aspects. The new area of information science, informatics, which is the application of technologies in different sectors of life, can be adopted easily by rural women in agriculture such as application of agricultural informatics (Jiyane, Boloka, Mugwisi and Ocholla: 2019) for forestry economies, oceans and river economies, and other areas where rural women are engaged in.

It is common knowledge that challenges to health system in rural areas is prevalent. In addition, the high crime rate makes it impossible for health services to adequately reach rural communities, particularly rural women. However, with 4IR, mobile health services, smart phones’ applications can be used to access and share health information and knowledge; between the women and their health providers.

Several studies (Jiyane 2002; Jiyane and Ocholla, 2004) have documented that rural women do not have the time and means to leave their families and homes in order to get formal education or to re-skill. In the era of the fourth industrial revolution, distance learning is possible for aspiring rural women. The use of electronic learning and electronic support, such as skyping, rural women are guaranteed empowerment and advancement. They can leapfrog, as long as proper and relevant infrastructure and resources are available. With over 5 billion people subscribing to mobile services worldwide at the end of 2017 and close to 3.3 billion of them subscribing to mobile internet. With this exponential growth, women can access information, services and life-enhancing opportunities. It is acknowledged that the mobile internet penetrating women is still low with 10% of the Tanzanian women compared to 30% men. In terms of access to technology by women in SA, out of 54 978907 population in 2016, there were 28 580 290 internet users, an increase from 5.5% to 52% (Internet World Stats, 2017). Further the users were between age 20– 50 with almost an even number between male and female users (Effective Measure Demographic Report, 2014). Although the report by Energia International Network on Gender and Sustainable Energy (2019) indicates that plans are in place to provide electricity with women in mind, absence of electricity fails to improve public services in African countries including South Africa.

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Sources of information used by most rural women to access information have been found as relatives, friends, radios, church members, traditional leaders and other less modernised kind of technologies. It is possible and the 4IR offers opportunities for rural women to leapfrog to, in addition to the sources currently used, smart technologies brought by the 4IR.

**Is South Africa in the Fourth Industrial Revolution?**

I have discussed the requirements of South Africa to be in the information and knowledge society (Jiyane 2012) and concluded thatthe information and knowledge society offers opportunities for improved infrastructure and telecommunications and increased and fully equipped and resourced information centres such as tele centres and libraries that support easy and speedy access to and the smooth flow of information and knowledge. This access, use and flow of information and knowledge facilitates informed decision making, improved productivity in business, and improved service delivery between clients and suppliers, and opportunities for global participation and recognition. Business processes are easy to follow because ICTs facilitate the storage and retrieval of information and documents, thus making business activities more transparent.

Even though there are many challenges in the access and use of ICTs in rural areas, women are seemingly keen to try a wide variety of sources, including sophisticated technologies, if they had access and knew how. This has been demonstrated in their possession and use of mobile phones in particular. With the right support, ICTs really could benefit rural women and help them leapfrog into the information and knowledge society.Earlier I argued that in order for South Africa to embrace 4IR it has to achieve the requirements of the previous societal and economic revolutions or transformations some of which are reflected in figure 2. I also noted the ‘leap frogging’ tendency in how developing countries access and use new technologies. Thus, they would normally not go through all the stages of the revolution as common in the developed countries. For that matter the question whether South Africa is in the fourth industrial revolution is crucial. I note the following tendencies:

* Public policy in South Africa clearly articulated as Acts, Visions and Agendas (2030 & 2063) and more initiatives implies that SA is part of a global citizenry and global community. This indicates that the country, playing a role on global platform, conforms, complies and is eager to measure its efforts towards its own people, including rural women. Therefore, the efforts towards improving the lives of its rural communities are transparently in the national policies.
* Internet bandwidth has been increased to allow connectivity at all times.
* Access to education has been a drive since the new dispensation in 1994. Although we may not take pride in the education per se, children are able to access education, and in the school system from the age of five. Recently, the movement towards accessing higher education has seen more post-matriculants entering the systems of higher learning.
* Resources such as public libraries and school libraries are easily accessible. This indicates that scholarly and general civic information are speedily accessible. Currently, KwaZulu-Natal alone prides itself with 209 public libraries (Mthembu, 2019). In the drive to improve resources in South African schools, the initiative by the Basic Education Ministry of 1000 school libraries per year until 2019, has seen every new school built in South Africa given a state of the art library. Although the evaluation and assessment is yet to be done on how many were eventually built through this initiative, it cannot be dismissed that schools have been equipped with such important resources. This implies that the whole package of well trained staff to manage resources in the 4IR has been produced, with high relevant skills to provide services anywhere, anytime anyhow (Ocholla, 2019).
* Transport is vital for ease of mobility in an efficient way. South Africa’s road, rail and air transport system are of global status, particularly in urban places, which may however, not always be said in many rural patches. However, generally, the transport system ensures easy transportation of goods and services to other parts of the rural end, where women mostly reside.
* Health system in South Africa has been made transparent and satisfactorily accessible to all South Africans, including rural women. The national health insurance in this sector makes one hopeful that health matters are being addressed as a priority. Health information is now easily disseminated and accessible through different media and networks. Health and health information for women is vital for their longevity. With smart devices and improved technology of this era, such information and knowledge can reach out, with speed and efficiency, to a wide range of rural places where women dwell.

**Can this level of development advance rural women? How do we respond to the 4IR?**

There should be facilitation of the effectiveness of teaching and learning in many ways, e.g. e-learning systems, which can enable the sharing of information and knowledge, best practices, classroom experiences, and cross-disciplinary learning between diverse geographies.

We should strengthen technical and vocational training systems, work-based learning for [students] and promote careers through public campaigns, vocational tracks in education and investment in technical and vocational systems. Rural women may benefit in this as well. Through such training systems, they can go back to adult education as the opportunities should allow them to re-learn and empower themselves

Knowledge transfer and mutual learning in innovation networks should play a central role to curb complexities in the use of technologies. It is known that new technologies and innovation networks continuously change in the intensity of innovation and overall architecture; systems can be too complex and therefore adaptive management is required. Literature indicates that rural women are in possession of mobile phones, and some even smartphones. In order to minimise complexity in the features of such devices they have and increase use, mutual learning and competencies may be the support they need for their empowerment.

It is known that civil society (academics) has for a long time acquired the knowledge and history of working with the most vulnerable populations in difficult context. With this experience of proximity to community issues, for example through community engagement or being engaged scholars themselves, academics and other civil societies can reach out to rural women and support them by providing necessary information, knowledge and practical skills to thrive through the 4IR. If we look at the National Development Plan, the Vision 2030, it encompasses all that is needed to leapfrog rural women in the 4IR (see Figure 3 bullets 2-6 are addressing rural women’s issues). If these issues are properly addressed by all stakeholders, including the scholars and academics, rural women can leapfrog development and be empowered.



**Fig 3: The Plan 2030: Prosperity & Equity**

**Source: Adapted from NDP-Vision 2030**

The availability of infrastructure in the vicinity of rural women could encourage them to buy smartphones. If academics impart to them the skills on how to operate the phones, rural women can easily surf through the net and connect with their counterparts and other stakeholders, for information and knowledge on different aspects of their lives: health, family, work or business, children or their own education. Through strong infrastructure, rural women can connect and stay connected for as long as they need to be. For those that are entrepreneurs or in small and medium businesses, they can purchase, market and sell their products online. They can negotiate better deals with suppliers and they can have easy access to delivery and mobility in terms of their products.

Good and strong road infrastructure can promote easy mobility among rural women to places that they need to be. It could be to the health care centres, government grant facilities, workshops and training facilities and other related facilities that could empower them.

Clean water systems in rural areas, and information and knowledge regarding water purification methods and systems can improve rural women’s health and reduce immature deaths and fatal incidences that occur due to unusable water and incorrect measures to clean inconsumable water. With this in place, the life span of rural women can improve and they could be active participants in improving their families, communities and the economic growth of the country. The Vision 2030 prepares and positions the country and rural spaces, accordingly, to assume the level of the 4IR.

The Vision 2063 is another initiative that addresses the issue of women, including rural women empowerment. Aspiration 6, addresses the development of women among others and subsequently, Aspiration 7 regards women as role players on the global world. And being participants as global citizens, rural women can therefore express themselves through relevant information and knowledge.

Article 18 of the African Charter on Human and People’s Rights call for the elimination of, among others, women’s discrimination. This implies that rural women are rightfully supposed to be partly empowered, by all means, to be players and to reap the benefits of the 4IR.

**Conclusion**

If South Africa is in the 4IR, what are the implications?

* Definitions of the 4IR indicate that this era has brought about radical technologies in all sectors of economies.
* Innovations in terms of institutions of higher learning, work environments, homes and communities, are inevitably required to be the core focus.
* Competencies such as skills development and re-skilling- through the assistance of stakeholders with empowerment and advancement of rural women at heart, such as academics, who have been for a long time, and are continuously working with rural communities. Information, knowledge and skills transfer could be done to uplift these women.
* The implementation of the National Development Plan (NDP 2030) and SDG, and other initiatives, should be speedily rolled out to reach rural women in deep rural communities. Otherwise, they will lag behind. Right now, the opportunity to leapfrog is still possible.

 There is urgent need to develop and strengthen Continuous Professional Development (CPD) to empower communities and keep in pace with rapid changes emerging from 4IR where HEIs are poised to play a major role largely in competency development for rural women empowerment. Based on the ensuing discussion, I propose the following conceptual framework (Fig. 4).

**EMPOWERMENT/DEVELOPMENT** RESPONSE

TRAINING, WORKSHOPS, APPRENTICESHIP,CPD, INFORMAL EDUCATION

**INFRASTRUCTURE** RESPONSE

POWER SUPPLY, INTERNET, CONNECTIVITY, TRANSPORT, ROADS, MOBILITY, MOBILE TECH, SPACE, PEOPLE, CONTENT/KNOWLEDGE

**OTHER** RESPONSE

RURAL WOMEN

**HEIs RESPONSE** COMMUNITY ENGAGEMENT

CPD, WORKSHOPS, SEMINARS, TRAINING, TRAINING, WIL

**STAKEHOLDERS** RESPONSE

**DEVELOPMENT** RESPONSE

SDGs, HEALTH, EDUCATION, LITERACY

**Fig. 4: Proposed Framework for RW response to 4IR**

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