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Mainstreaming Disaster Risk Reduction into Millennium Development Goals: A Proposed Framework for Post 2015

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Abstract

The year 2015 is referred to as a milestone year because it marks the end of Millennium Development Goals and HFA to build the resilience of nations and communities to disasters. Disaster Risk Reduction should be integrated into sustainable development policies and planning as a strategy of achieving MDGs. However, it is the missing link in the achievement of the MDGs. Measurement associated with the education targets and indicators has been associated with the omission of salient aspects of quality, context and equity. The MDGs do not give any indication on what should be learned and by whom. Neither do they factor in inequality; for example children who drop out of school may be classified as enrolled. The MDG indicators currently do not pick up either inequities of who is and is not enrolled or completing or the perverse incentives associated with large numbers of children being enrolled in school but learning little especially the poorest in remote locations. They do not factor in the pupil-teacher ratio, problems of inequities, socio-economic status, quality, and complexities of gender. Secondly, the indicators of achieving universal primary education focus on ages 15 to 24. This ignores adult illiteracy with its consequences, further deepening inequalities. Further, there is no indicator for inter-sectoral action. In fragile ecological zones where repeated disasters hit, the vulnerability is intensive but does not make any news. In most cases, these disasters go unnoticed. Moreover, the sex and gender differences in vulnerability to the disaster and how they influence quality outcomes in education is often overlooked. Information regarding school performance and factors influencing it among disaster exposed children is very limited in Kenya. No study has investigated other factors that could be contributing to the same considering the environmental, social, political and economic context of the curriculum implementation. This paper fills this gap in knowledge and further contributes to the ongoing debates on Sustainable Development Goals of Post-2015.

Keywords: Education: Disaster Risk Reduction: Millennium Development Goals: Post-2015: Resilience: Sustainable Development Goals.

INTRODUCTION

Education is a powerful driver for realizing all of the Millennium Development Goals and Hyogo Framework of Action for sustainable development. It has a prominent position in MDGs and Hyogo Framework for Action (Unterhalter, 2013). The year 2015 is referred to as a milestone year because it marks the end of MDGs and HFA to build the resilience of nations and communities to disasters. At a recent high-level plenary meeting of the sixty fifth session of the General Assembly on the MDGs, the heads of states and governments gathered at United Nations headquarters New York 2010 to welcome progress made since 2005 and expressed deep concern that the progress falls short of what is needed. They unanimously agreed that Disaster Risk Reduction should be integrated into sustainable development policies and planning as a strategy of achieving MDGs. This was urgent so as to address poverty and vulnerability, unplanned and poorly managed urban growth and declining ecosystems considering adaptation to climate change and better health outcomes (MDG Summit 2010

Outcome Document, September, 2010).Disaster risk reduction is the missing link in both MDGs and HFA.

In the context of Sustainable Development Goals, there is renewed urgency to integrate it into development policies, plans, programmes and budgets at all levels (UN General Assembly resolution 66/288, 2012). Using education as 'a hub', integrating DRR into development plans via National Adaptation Programmes of Action (NAPAs) will ensure effective development without overlapping frameworks. Education is increasingly linked with other sectors, with the impact of basic education felt strongly across a number of sectors and goals. Similarly, progress in education depends on advances in achieving other public goals, including the MDGs not related to education. It is important that policies recognize the inter-linkages between education and other areas, and that synergies are created in order to achieve the different internationally agreed upon goals.

Statement of the Problem

Education has a prominent position in the Millennium Development Goals and Hyogo Framework for action. Disaster risk reduction as a strategic development issue is hindering efforts towards achievement of the MDGs (UNESCO and AU, 2013). DRR is also an effective tool for reducing vulnerability and increasing resilience of communities to disasters (UNESCO, 2006). Over the years, measurement associated with the education targets and indicators has been associated with the omission of salient aspects of quality, context and equity. The MDGs do not give any indication on what should be learned and by whom (Perlman-Robinson, 2011). They do not factor in the pupil-teacher ratio, problems of inequities, socio-economic status, quality, and complexities of gender (Jansen, 2005; Rose, 2005; Unterhalter and North, 2011; UNESCO, 2012).Neither do they factor in inequality; for example children who drop out of school may be classified as enrolled. The MDG indicators currently do not pick up either inequities of who is and is not enrolled or completing or the perverse incentives associated with large numbers of children being enrolled in school but learning little especially the poorest in remote locations. Secondly, the indicators of achieving universal primary education focus on ages 15 to 24. This ignores adult illiteracy with its consequences, further deepening inequalities. Further, there is no indicator for inter-sectoral action.

In fragile ecological zones where repeated disasters hit, the vulnerability is intensive but does not make any news. In most cases, these disasters go unnoticed (UN/ISDR, 2012). Moreover, the sex and gender differences in vulnerability to the disaster and how they influence quality outcomes in education is often overlooked. Further, there is an assumption over the years that the poor results reported from these zones are solely due to the perennial floods or drought. Information

regarding school performance and factors influencing it among disaster exposed children is very limited in Kenya (Mukuna, 2013: UWEZO report of 2012). No study has investigated other factors that could be contributing to the same considering the environmental, social, political and economic context of the curriculum implementation. Indicators that will help explain these scenarios and give a voice to these voiceless communities are urgently required for sustainable development. This paper hopes to fill this gap in knowledge by stimulating debate on bottom-up and top-down approaches to elimination of inequalities in achievement of MDGs. It hopes to contribute to knowledge on post MDGs and HFA indicators.

Literature Review

The Interplay between Education and MDGs

Education plays a crucial role in economic development, and progress towards this goal has spillover effects on other MDGs. David Gartner (2010) in his article ''Achieving the Millennium Development Goals: Education is the Key Missing Link'', has stated that for most of the MDGs, particularly those that are most off-track, success will be nearly impossible without the achievement of universal primary education, MDG 2. With 72 million children still not in primary school, achieving universal education would offer extraordinary leverage in the broader fight against global poverty. However, this MDG indicator was stated in terms of primary completion ratios rather than gross enrolment. This indicator needs to be restated. The other indicators are; proportion of pupils starting grade 1 who reach the last grade of primary thus completion and retention rates in primary schools ;and literacy rate of 15-24 year old men and women. This ignores adult literacy yet it is a critical factor in fostering achievement of universal basic education. Low completion rates are partly attributable to poor educational quality, late entry into school, poverty, long home-to school distances, poor nutrition and health, and lack of parental awareness of the importance of sending children to school on schedule (UNESCO-ECA and AU, 2013).

He goes further to say that while there is some progress in poverty reduction for MDG 1: "Eradicate extreme poverty and hunger," there is much less progress on the commitment to halve the number of people suffering from hunger by 2015. Child malnutrition is a key dimension of world hunger and 137 million children under the age of 5 are still underweight globally. Educating women is an important tool for reducing child hunger, according to a cross-country analysis of 63 countries. The study found that educational gains in women's education accounted for 43 percent of all progress in reducing child malnutrition.

MDG 3: "Eliminate gender disparity," commits to

closing the gender gap in all education levels and increasing female representation in the wage employment and national parliaments. The latest data indicate that 28 countries still have fewer than 9 girls in school for every 10 boys. Nearly two-thirds of these countries are located in sub-Saharan Africa, where there are fewer than 8 girls for every 10 boys enrolled in secondary school (Gartner, 2010). A focus on educating girls, especially in Africa, is not only essential to achieving universal education, but it is also vital to achieving the nutrition and health MDGs. The other indicators are; share of women in wage employment in the non-agricultural sector and; proportion of seats held by women in parliament. This begs the question, 'how can women get involved in wage employment or participate in governance without education? It means that if MDG 2 is achieved, automatically MDG 3 will be achieved. If there is a shortfall of universal primary education, that shortfall tends to be worse for girls than boys in schools. MDG 2 and MDG3 seem to measure the same thing. Since the target is defined in terms of attaining an absolute level, then regions with the lowest enrolment rates will have the furthest goal in attaining absolute level goals of universal enrolment and gender equality in schooling. This means that marginalized areas will continue to lag behind.

MDG 4: "Reduce child mortality by two thirds''. Studies have revealed that the level of mothers' education influences child survival (Ambasa, 2012). There is therefore a strong correlation between mortality rates, and school enrolment, gender and equality. Larry Summers found that children in Africa born to mothers with just five years of education were 40 percent more likely to live to age 5. The children of educated mothers are much more likely to be immunized against killer diseases, their mothers are much more likely to have received antenatal care, and they provide better nutrition to their children. Achieving universal primary education and reaching gender parity in education could save millions of children's lives and put MDG 4 within reach. The next health commitment, MDG 5: "Improve maternal health", calls for reducing maternal mortality by three quarters between 1990 and 2015. Despite some progress globally in reducing maternal deaths related to childbirth, there has been much less progress in Africa in recent decades. While medical interventions are critical to responding to this challenge, education is again one of the most leveraged investments according to recent studies. One recent study found that female education alone, both female literacy and the ratio of female enrollment, could explain 50 percent of the variance between countries in rates of maternal mortality. In Bangladesh, the significant fall in maternal mortality over recent decades can in part be explained by the dramatic expansion of education for girls (Gartner, 2010). Education is also a crucial strategy for a leveraged response to AIDS. MDG 6: "Combat HIV/AIDS, malaria, and other diseases." MDG 6 commits to halting and

reversing the spread of these diseases by 2015. Yet, despite impressive progress in recent years in expanding access to AIDS treatment, the results on the prevention sides show that much work remains to be done to reverse the spread of the disease. Research on the last decade of the AIDS epidemic indicate that increased schooling is lowering the rate of AIDS infections and that expanded access to secondary education is especially significant in reducing female vulnerability to infection. Alongside other comprehensive prevention strategies, expanding educational opportunities in the most affected countries is critical to reversing the spread of HIV/AIDS. For example, use of condoms and even family planning depends on maternal education (Ambasa, 2012).

MDG 7: "Ensure environmental sustainability" focuses on promoting a sustainable environment by protecting environmental resources, halving the number of people without water and sanitation; proportion of land covered by forests, biodiversity protected; energy use; carbon dioxide emissions; population using solid fuels; accessibility of clean water and proportion of households with secure tenure. Once again education plays a critical role even in helping the affected population to understand the environmental dynamics and get involved in ecosystem conservation and governance (Mukuna, 2013; Onywere et al, 2011). Education is therefore the cornerstone in the efforts to achieve the MDGs, foster resilient and sustainable growth and development. We see education as the 'one stop shop' for achieving the other MDGs.

However, in this chapter, we beg to differ with other researchers that have hailed universal primary education including the MDGs and previous frameworks on development. These frameworks that link basic education and human capital theory giving basic education a lot of significance, and assuming that basic education will help achieve MDGs are misleading (Heynemann,2009;World Bank,2005).The focus on basic education by donors was due to affordability at the expense of higher education that is seen to be expensive. In the process, the world has lost on research, technology and innovation required to propel development. We cannot blame the designers of the MDG framework wholly because they were building on the Jomtein Education for All conference (1990). The United Nations Human Rights Declaration,1948; the International Covenant on Economic Social and Cultural Rights (ICESCR,1976) and the Convention on the Rights of the Child (CRC,1989) all promoted universal basic education.

The World Bank changed its mind on the importance of higher education after 2003 and put secondary and higher education at the heart of anti-poverty activities. This was after two reports' 'World Development Report 1998/1999 and Constructing Knowledge Societies, 2002''.They reported that social and economic progress is achieved through advancement and application of knowledge. Tertiary education is critical for creation, dissemination and application of knowledge for building

technical and professional capacity (Labeau and Sall, 2011). However, funding to post secondary education has remained very limited (Marginson and Naidoo, 2011; UNESCO, 2012).In this chapter, we advocate for incorporation of higher education into the MDGs with proper targets and indicators. Our take is that no country known to us has got out of poverty through having basic education. All the other MDGs need high level technical skills and experts to push the goals. All the MDGs need policy experts trained through higher education. Heavy investment must be made by national governments in higher and technical education.

The Achievement of MDGs in Kenya

In Kenya, MDGs date back to the Sessional paper no.10 of 1965 which focused on the elimination of poverty, disease and ignorance. Subsequent government policy documents have since then focused on mainstreaming MDGs into policy, planning and budgeting process. Kenya started implementation of MDGs in September 2002 and the MDGs based planning was launched in 2004. Mainstreaming MDGs in Kenya has been done under two themes; "Mainstreaming MDGs in Kenya's Development Process" - 2004-2009 and Mainstreaming, accelerating and coordinating MDGs in Kenya's development process"-2011-2013. A Needs Assessment Study was carried out in 2005 to establish the resources required to achieve the MDGs by 2015; the financing gap stood at Ksh 4.1 trillion. The Needs Assessment informed on the need for an aggressive mainstreaming and advocacy campaign for the MDGs (GoK, 2005).

The Economic Recovery Strategy (ERS) of 2002-2007 address most of MDGs through recognition of key Economic sectors. Kenya's Vision 2030 incorporated the MDGs (GoK, 2007). The first Medium Term Plan (MTP 2008-2012) aimed at accelerating the achievements of MDGs by redirecting spending to high priority areas. Sector Plans 2008-2012 which were drawn from the Vision 2030 and its 1st MTP also mainstreamed MDGs. Corresponding District Development Plans also ensured that local level planning and budgeting in all districts was responsive to the MDGs. NIMES the tool used for tracking and reporting on Vision 2030 flagship projects, also reports on MDGs through sector reporting. The Vision 2030 is a long term national policy framework to be implemented through 5 year medium term plans. The just launched MTP 2 process will incorporate MDGs and their targets. Interim County development plans are expected to mirror the image of the Kenya Vision 2030 at the county level and are expected to ensure that local level planning and budgeting in all counties is responsive to MDGs.

Current progress towards the MDGs indicates that they are unlikely to be met partly because of inadequate access to social services, especially for the poor in our society. Social Protection in Kenya is defined as: "*policies and actions aimed at enhancing the capacity of and opportunities for the poor and vulnerable to improve their livelihoods and welfare."Disaster risk reduction is therefore a social protection measure.* Inequality in Kenya is fairly high - the Gini index is 42.5 and the richest 20 percent of the population control 49.1 percent of the GDP. It is, therefore, critical that mechanisms to tackle poverty and vulnerability directly are given priority if an improvement in social indicators is to be achieved (RoK, 2009). Households in arid areas are more vulnerable than households in non-arid areas. The main risk factors in arid and non-arid areas were the unpredictability of rainfall, adult illiteracy, poor market accessibility, exposure to ill-health, and unemployment (RoK, 2011)

MDGs implementation is monitored goal by goal every two years. Reports prepared in 2003, 2005, 2007, 2009, 2011 and 2013. These reports are important in giving the status of each goal against given targets and indicators.

Goal 1- Eradicate Extreme Poverty and Hunger; The MDG report on the Status of their achievement in the East African Community by Kakande (2010) indicates that poverty rates have gone up. Just like the African report on the same, Kenya belongs to the many countries that are off-track to achieve this goal. Sustaining progress in poverty reduction will require increasing the pace and inclusiveness of the growth process as well as investment in social services and infrastructure and to support the vulnerable communities. This goal is unlikely to be met by 2015.

Goal 2; Achieve Universal Primary Education; with the launch of FPE (Free Primary Education) in 2003 the country is on track to achieve universal primary education .Gross enrolments ratios rose from 88 % in 2002 to 115%in 2011. Primary to secondary school transition rate also improved from 67% in 2009 to 73% in 2011 .Net enrolment rates rose from 92.9% in 2009 to 95.7% in 2011. Kenya has completion rates at 90% while other East African countries are at 70%. Gender parity has also been achieved in the enrolment rates (Kakande, 2010). The constitution of Kenya has put basic education as a right for every school age going child .The cabinet recently approved a bill that guarantees free ECD, Primary and Secondary Education. Goal is likely to be met by 2015.

However, progress has not been universal. Disparities in access, quality of education enjoyed by learners and in learning outcomes among populations and groups exist due in large part to social, economic and cultural factors. Marginalized individuals and groups do not just accumulate fewer years of education, but often receive a poorer-quality education that results in low levels of learning achievement. Underlying causes are diverse and interconnected, with household poverty being one of the strongest and most persistent factors for educational marginalization. Gender is another important barrier, especially when these are combined with other factors such as culture, language, ethnicity, race, geographical

location, disability, health and other socio-political contexts (UNDG, 2010; RoK, 2009).

Emerging concerns, such as global warming and the impact of recent economic downturn on national and household financial capacities, have underscored that primary education is struggling to be recognized as a major priority for additional policy attention and resources. There are proven multiple benefits of education on other aspects of development. It is important to remind the international community and policy-makers of the importance of higher education in strategies addressing a range of other developmental goals, including the other MDGs, and, in turn, the impact which other sectors have on educational outcomes(RoK,2010). In the years leading to 2015, these aspects need to be emphasized.

Goal 3; Promote Gender Equity and Empower Women; Proportion of female MPs at 9.9% in 2011 up from 4.1% in 1998. The Constitution of Kenya 2010 guarantees a representation of at least two thirds of either gender at the level of national and county assemblies. Share of women in wage employment in the non-agricultural sector was at 29.8% in 2011. There are specific measures in place to realize progress towards gender parity in various sectors. For instance, the Government has put University entrance cut off points for girls at two points lower than that of boys and pledged at least 30% of all Government appointments to go to women as part of the affirmative action to address the gender gap. Goal is on track.

Goal 4; Reduce Child Mortality ; Both Infant mortality and under-five mortality rates have remained at 52 deaths per 1,000 live births and 74 deaths per 1,000 live births respectively as was the case in 2009 .The proportion of one year olds who are fully immunized was 80% in 2011 against 90 % 2015 target up from 78 % in 2009. Drugs for prevention of mother to child transmission of HIV are available in almost all Government health facilities.

Goal 5; Improve Maternal Mortality; as at 2011, 43.8% of births in Kenya were attended to by trained health personnel against a 2015 target of 90 %. Only 43% of deliveries take place in health facilities. Maternal mortality rates are at 488 per 100,000 live births in 2011 against a 147 target by 2015. Contraceptive prevalence rate is at 46 % up from 39% in 2000 against a 2015 target of 70 %. Goal 4 & 5 are faced with regional disparities and are lagging behind in the country.

Goal 6; Combat HIV and Aids, Malaria and other Diseases; The overall HIV prevalence rate among adults 15-49 years was estimated to be 6.3% in 2011 (KDHS 2008-9) down from 7.4% in 2007 and 6.7% in 2003 (KDHS2003). The HIV prevalence among youths aged 15-24 years was 2.9 % in 2011 down from 3.8% in 2007. Prevalence rate among adults 15-49 years was estimated to be 6.3 % in 2011 (KDHS 2008-9) 7.4 % in 20. Inclusion of HIV/AIDS in school learning curriculum will help in sustaining the gains made so far. The proportion of

Kenyan households owning at least one Insecticide Treated Net rose from 6% in 2003 (KDHS 2003) to 48% in 2007 and 56% in 2008/09. The proportion of under-five children using ITNs increased from 5% in 2003 and 39% in 2007 to 47% in 2008/09.

Goal 7; Ensure Environmental Sustainability ; At the end of year 2011, the proportions of rural and urban populations with access to clean drinking water were 48% and 75% respectively(KNBS) .The proportion of households with access to improved sanitation was at 22.6% in 2008/09 (KDHS 2008/09) having increased from 19.4% in 2003 (KDHS 2003). 73.6 % of urban population has access to durable housing.(2009 Census). National forest cover is at 4% against a 2015 target of 10 % .There is increased investment in green energy e.g. commissioning of Olkaria Geothermal plant

Achieving the MDGs will require increased national attention to the welfare of the most vulnerable. In almost every goal success is threatened by the attitude of "business as usual" and a lack of clarity on how to engage between the policy makers and planners on one hand and the poor and vulnerable on the other (GoK and UNDP, 2010).

MDGs and Human Rights

Human rights have not yet played a significant role in supporting and influencing MDG- based development planning in Kenya. There are some similarities between the MDGs and human rights. The content of MDGs partly resembles some economic and social rights, and both provide tools to hold governments accountable. They can also reinforce each other since MDGs potentially provide benchmarks for economic and social rights, and human rights strategies can offer enhanced legitimacy, equity and sustainability to the types of policies needed to achieve the MDGs.

One of the key concerns from a human rights perspective is that the MDG targets are not sufficiently focused on the plight of the poorest of the poor or inequality within a country. Several of the MDGs targets are not consistent with human rights and potentially diminish the gains enshrined in international human rights treaties. For instance, the target for Goal 2 should clearly state free, compulsory and quality primary education to bring it in line with international human rights treaties, and the strategies should ensure there is sufficient emphasis on the inclusion of disadvantaged communities and children with disability. While these inconsistencies between MDGs and human rights are not fatal, there is general agreement that some synergy would work to the advantage or even acceleration of MDG attainment. In this respect a number of actions can help in creating the necessary synergies:

a) Aligning the Goals with human rights by harmonizing MDG targets with human rights standards. This includes ensuring that the targets and indicators

effectively correspond to economic, social and cultural rights, that gender is mainstreamed, and that efforts are adequately directed towards disadvantaged and marginalized groups or communities.

b) Be transformative, not technocratic, by adopting a human rights approach to empowerment and participation in target setting, policy making and implementation. In order to create the conditions for effective participation and good governance, civil and political rights must be effectively respected.

c) Prioritize rights by making policy choices and resource allocation decisions within a human rights framework. MDG related policies should be evaluated as to whether they will actually reduce inequality and poverty, and sufficient resources should be allocated to reach human rights consistent goals.

d) Citizens should own the MDGs by ensuring enforceable rights, accountability mechanisms and sustainable strategies. The human rights approach offers a relatively objective and comprehensive framework for legal empowerment and accountability to help ensure that the MDGs are not only attained, but that the achievements are sustained beyond 2015.

The impact of disasters on human rights can be of a direct nature, such as the threat that extreme weather events may pose to the right to life. But often they will have an indirect and gradual effect on human rights, such as increasing stress on health systems and increasing vulnerabilities related to climate change-induced migration (UNGA, 2009). The same holds true for virtually all types of natural hazards. Disaster risk reduction contributes to the protection of human rights by reducing the likelihood of natural hazards having a negative impact on housing, health, land rights and access to food, to give a few examples. Disaster risk reduction provides an enabling environment for the promotion and protection of human rights, particularly as it applies to indigenous peoples, whose close relationship with their natural environment makes them particularly vulnerable to disaster risk (UNGA, 2014).

Strategies to reduce disaster risk require collaboration and the technical input of a wide range of actors if they are to be effective and they must include the perspective of the indigenous peoples whose human rights and lives they are designed to protect. No one agency or sector alone can hope to achieve meaningful change, and therefore, the very process of designing risk reduction strategies, through partnerships in which human rights agencies, disaster risk reduction experts and representatives of indigenous communities work together, provides an excellent opportunity to improve the participation of indigenous peoples in decision-making processes(UNGA,2014).

Kenya's constitution and the National social Protection policy (RoK, 2011) recognizes that certain populations have an increased risk of experiencing and being susceptible to hazards, for example, economic shocks, natural disasters, loss of income or ill health.

Unfortunately, in Kenya as in other nations, the poor have a tendency to be exposed to multiple risks at once, making them less able to deal with shocks when they hit. The lack of means to cope with a hazard or risk is what makes individuals and populations vulnerable. Furthermore, it is these groups who have the greatest access deficit to social Security.

The new Kenya constitution 2010 provides for National Values and Principles of Governance within the body of the constitution under Article 10 which among others include: "…10 (2) (b) "human dignity, equity, social justice, inclusiveness, equality, human rights, non-discrimination and protection of the marginalized". Kenya's new constitution is fairly progressive not only in as far as human rights go generally but as far as the right to social security, in particular, is concerned. Vision 2030 contends that no society can gain social cohesion if significant sections of the population live in abject poverty. Reducing vulnerability and poverty is a key element of many social policies across government ministries in Kenya (RoK, 2011; RoK, 2009). There is an urgent need to integrate disaster risk reduction as a human rights strategy to achieving MDGs.

The Role of Education in Strengthening DRR Efforts and Building Resilience

Education is unique in that disasters have a great impact on the sector yet in itself it is also a powerful tool to reduce disaster losses. Specifically, disasters have a major effect on educational achievements by damaging school infrastructure and disrupting education cycles, thereby affecting the most vulnerable and exacerbating poverty, forcing children to drop out of school and undermining the resiliency of communities. At the same time, however, education, which increases public awareness and equips youth with critical thinking skills, is essential to build disaster resilience (Mukuna, 2013). Since DRR is inherently a cross-sectoral field, it is believed that having education-related DRR concepts in both an education goal and a DRR goal encourages integration and synergy, leading to a more comprehensive approach to DRR . The post-2015 MDG agenda has the opportunity to create an integrated and holistic approach to education and child wellbeing. With relevant and appropriate integration of DRR/ CCA into development policies and interventions for education, it is envisaged that there will be substantial increased resilience of vulnerable children and their communities to changing risks. Knowledge and education is a key component in resilience-building strategies.

The HFA (2005-2015) serves as the first effort to explain, describe and detail the work required of all different sectors and actors including education to reduce disaster risk. A number of agencies see the post-2015 development agenda as providing a new chance to

address the underlying causes of vulnerabilities and hazards, particularly for at-risk children and communities. Furthermore, the post- 2015 HFA agenda is an unparalleled opportunity to demonstrate international leadership on integrating DRR into the top-level framework that will guide poverty reduction and development efforts after the MDGs. The aggregate improvements shown in the number of children enrolled and progressing through school at the national level need to be qualified by regional and socio-economic disparities.

When looking at disaggregated data of the UWEZO Kenya Report, 2012, it becomes clear that often there is virtually no progression for children who are from the lowest socio-economic groups, the most subordinated ethnicities, generally living in rural areas or particular regions that have not benefitted from enhanced social development. In all these areas of inequity there are generally additional dimensions of gender inequity (UWEZO &Hivos/Twaweza, 2012). Unequal access to education is confirmed with other education statistics, where the EfA GMR, for example, shows how late entry into school, often associated with early exit, is most prevalent amongst the poorest (UNESCO, 2012, p. 65), how large proportions of the poorest children do not progress between education levels (UNESCO, 2012, p. 66-7) and how girls from the lowest quintile fail to complete secondary school (UNESCO, 2012, p. 185). In addition, much of the data on attainment confirms how this is linked with income, location and gender. Citizen assessments show low rates of formal literacy and numeracy among children, despite regular attendance to school. Where data is collected, these highlight how the lowest levels of attainment are amongst the poorest.

We reiterate Langford's (2012) discussion of criteria for selecting approaches to measurement to engage with the problem of what he calls 'the art of the impossible' suggested by the problems associated with measurement and the MDGs. Langford notes that any indicators selected for measurement should be appropriate to the theme selected, their salience should be easily communicable to a wide audience, good quality and appropriately comparable data should be available, which is robust, and subject to external verification. In their current form, MDG indicators fail to acknowledge that learning takes place in multiple sites, not only school, and the importance of action that can link together these disparate settings. In addition, the indicators selected should be action oriented; clearly signaling what should be done nationally and locally. They should be universally applicable, but sensitive to inequalities. We go further to add that the indicators should address inclusiveness and transformation of the communities. They should integrate DRR into the MDGs to reduce the inequalities in development that are seen in fragile ecological zones. The intersection of inequalities is a huge challenge for teachers working with the poorest, who often have minimal time or financial resources, inadequate training

and support, to address this. In most of these areas, the teachers are inadequately trained and supported to enable learning to take place.

Conceptual Framework

This study adopted Van den Akker (2003) Typology of curriculum representations and the Curriculum Spider web. He states that curriculum development needs policy making, design and development, evaluation and implementation. This can be done at different levels thus; international level or supra level, national or macro level, school/institution or meso level, classroom or micro level and at a personal or nano level. The supra level involves international debates, protocols/agreements on aims of quality education. He recommended that to understand why curriculum decision making and enactment has problems, a broader description of curriculum development is often most appropriate. He further explained that to understand the problematic efforts to curriculum change, three levels of curriculum development must be understood, namely, intended, implemented and attained curriculum. The intended curriculum refers to the influence of curriculum policy makers and curriculum developers. The implemented curriculum refers to the world of schools and teachers and the attained curriculum has to do with students/pupils. Akker concludes that for a comprehensive approach to education change, the levels, concepts, perspectives and arguments have meaningful implications.

In the case of DRR education, the intended curriculum is that proposed by Hyogo Framework for Action (2005;3) thus use education and knowledge to reduce peoples' vulnerability to disasters. This is where the rationale of the formal curriculum is drawn from. The implemented curriculum is that one at the school level. This involves school related factors like teaching and learning resources, infrastructure for implementation of DRR education, class sizes, grouping, location of learning, time allocated to the subject, objectives, content and evaluation procedures, the process of integrating DRR education into the primary school curriculum text books, pedagogical practices, teacher professional development, teacher perceptions on the implemented curriculum and the teachers' knowledge on DRR education. The attained curriculum refers to the socio-economic impact of floods on the learner outcomes and how they perceive the innovation. The inter relationship between the supra level, meso, micro and nano level receiving the curriculum also ought to be interrogated. Oblivious of these facts, this paper suggests that the supra level should go a step further and develop indicators for monitoring the implementation of Disaster Risk Reduction education in MDG2.

Akker further identified various components of curriculum development that must be attended to when

improving the curriculum. These are; Rationale/Vision (Why are they learning?); Aims and objectives (Toward which goals are they learning?); Content (What are they learning?); Learning activities (How are they learning?); Teacher role (How is the teacher facilitating learning?); Materials and Resources (With what are they learning?); Group (With whom are they learning?); Location (Where are they learning?);Time (When are they learning?) and Assessment (How do we measure how far learning has progressed?). This has been a major concern for many researchers who have analyzed the achievement of MDG 2. They have reported that the indicators do not explain what, how and by whom, but have gone ahead to measure the achievement of the MDGs. From this model, we have chosen MDG 2 as the focal point of all the other MDGs. The other seven MDGs are linked to the focal point and consistent with each other. They are connected to each other in a spider web. The weak links represent DRR. The spider web also illustrates that every chain is as strong as its weakest link.

METHODOLOGY

The study will be hinged on the Millennium Development Goals Framework with 32 indicators for MDG 1 to 7. It employed explanatory case study design .It adopted a mixed methods methodology using various data generation methods. Purposive sampling technique was used to select the research sample. The research sample comprised of 14 primary schools in Budalangi flood plains with 288 teachers, 4 Quality Assurance and Standards Officers, 2 District Education Officers, 6 NGO representatives and 300 parents. Data was generated from various sources and analyzed both qualitatively and quantitatively. We first of all designed a work plan, sampled the scope of the study and trained 4 local informants. We then proceeded to do a reconnaissance study to help us sharpen our research tools. At first, we did literature review and document analysis of government and school reports on enrolment, drop out, literacy, progression and gender/age disparities. Our focus was vulnerability caused by floods in Budalangi flood plains. We sought to understand their impact on education and tease out the focal point of education in development. We sought to understand the disaster trends by using questionnaires for teachers, in-depth interviews for head teachers, NGO representatives, QASOs, and DEO and Focus Group Discussions with parents. The in-depth interviews and FGDs were taped and transcribed. Later they were coded according to themes that make meaning.

The study investigated if there was a functioning education system during flooding/drought; how the flooding/drought affects the education system; if school buildings and infrastructure are lacking or destroyed (kitchens, sanitation facilities, storage etc.) and the current condition of the learning environment (space, materials, classrooms, staff). It also analyzed if the situation is the same for boys and girls. It found out the enrolment, attendance in school, and nutrition status (food security issues). It also investigated whether the learning spaces are safe, if available school facilities are fully functioning, if the flooding has affected the family structure and who makes decisions for children to attend school. It also sought to find out whether there is a school health programme and donor commitments towards the same and if facilities for the preparation and distribution of food were adequate.

FINDINGS

Impact of Disasters on Education

Natural hazards and extreme weather patterns destroy educational institutions, interrupt educational processes and result in great human losses. More than a billion students are enrolled in primary and secondary school, with about 875 million school children living in high seismic zones and hundreds of millions exposed to regular flood, landslide, extreme wind and fire hazards (UNISDR, 2010). While loss of life from major disasters is decreasing significantly, economic and livelihood losses associated with disasters are increasing considerably, undermining already stressed education budgets, as well as aggravating barriers to children's access to education and completion of quality learning particularly for girls and other marginalized groups. The HFA was adopted by 168 member states in January 2005 at the World Conference on Disaster Reduction. Its theme, Building the Resilience of Nations and Communities to Disasters, highlights knowledge and education as one of the five main priorities of action.Disaster Risk Reduction (DRR) education and safe school buildings are two key priority areas for action outlined in the Hyogo Framework for Action. An indicator of its achievement would be the inclusion of disaster risk reduction education in relevant sections of the school curricula at all levels (UNISDR, 2005, p. 9). DRR education is a broad approach which includes all actions aimed at reducing disaster risks including political, technical, social and economic composed of policy guidance, legislation, preparedness plans, agricultural projects, an insurance scheme or even a swimming lesson. The approach enables people to think and work across society. Its aim is to make sure that everyone, from governments to individuals, makes the right decisions to reduce the risk and impact of disasters. In so doing, a coming storm or flood will not turn into a disaster waiting to happen. It is recommended that DRR education should be integrated into the school core curriculum. All governments are expected to get committed to teacher training and curriculum development to support large- scale teaching on disaster

risk reduction (UNESCO, 2011). Integrating DRR education into the school curriculum is supported by UNISDR (2006), UNDP (2004), Izadkhah and Hossein (2006), who all agree that school and children are the best agents of disseminating DRR education information to their communities. Despite the international as well as national focus on the prevention and mitigation of disasters, their continuous impact and increase in loss of life and economic assets losses are a clear indication that more than just pure disaster management should be undertaken. Education and public awareness are the cornerstones of approaches aimed at reducing vulnerabilities to natural hazards (UNISDR, 2006).

The UN Convention on the Rights of the Child (1990) recognizes that every child has both the inherent right to life (Article 6) and the right to education (Article 28). Known, expected and recurring hydro-meteorological and geophysical hazards threaten both of these rights. Today, as the global commitment to the MDGs is avidly pursued, including the achievement of universal primary Education for All by 2015,deliberate proactive steps are needed in ensuring that every school is a safe school and that children's education includes the knowledge they need to keep themselves and future generations safe. The promise of education will only be fulfilled if every new school built is a safe school (UNESCO, 2007; Izadkhah and Hossein, 2006).

Disasters have educational impacts: Damaged schools disrupt hard won educational rights. When instruction time is lost, quality of education drops. When there are no plans for alternative locations and students are denied continuous schooling, many will never be able to catch up and will drop out permanently. When educational records are missing, students may fail to matriculate and go on to further education. A partial list of the physical impacts of disasters on schools, school-children and teachers provides compelling evidence that cannot be ignored. School buildings destroyed must be rebuilt at much greater cost than the 4-8% average incremental cost of disaster-resistant construction. Some of these events will continue to strike during the school day, when vulnerable school buildings will collapse and may cost tens of thousands of children their lives if no action is taken (Petal, 2008; RCC, 2007).

Disasters have economic impacts: schools damaged beyond repair or unsafe require a level of reinvestment many times higher than the initial small incremental cost of building safely. Loss of income, housing and delays in matriculation make it challenging for families to support children continuing their education. Disasters have psychosocial impacts as well: lack of resiliency development and prior empowerment leaves school communities ill-prepared to deliver psychological first aid and to recover rapidly; students lose a sense of continuity

and their hopes and plans for the future are destroyed (Petal, 2008; RCC, 2007). In Budalangi flood plains, the following are the impacts of floods on education. See appendix for pictures showing the impact of flood on education in Budalangi floods plain.

Disrupting educational services and learning

Access to school: damages caused by disasters can result in students and teachers as well as school personnel being cut off from school facilities. The number of days off is so great that it threatens to reduce school attendance to below the required 220 days (Plan International, 2012). Chaos and lack of law and order in the aftermath of disasters also cause concern for the safety of girls in travelling to schools (Plan International, 2013). We sought to know how floods affect education and education programs in Budalangi flood plains primary schools from curriculum change stakeholders. Their responses were as follows:

> The floods cause a lot of suffering. Most of our pupils turn to absenteeism due to water borne diseases during and after the floods. There is also disruption of family life (Head teacher, Sibuka Primary school).

School interruption when school facilities are used as shelter

Schools are often used as shelter for those internally displaced by disasters. Inadequate housing and emergency asylum, force large numbers to seek shelter in schools, sometimes for a month at a time, causing students to fall behind and many to drop out.

> If I may add something… apart from sexual exploitation of women, the girl child also suffers a lot. Some are forced into early marriages so as to run away from the poverty and suffering in their homes. This leads to high dropout rates of our girls. Others are sent away from home as house maids so that they can be sending money back home to their parents. This contributes to school dropout (Teacher, Budalangi Primary School).

At Mudembi which was an IDP camp in December 2011, it was very overcrowded. Boys and men were separated from girls and women. After the floods, almost half of the girls especially in classes 5 to 8 did not return to school because they were pregnant. They lacked close monitoring from their parents. In the camps, there is a lot
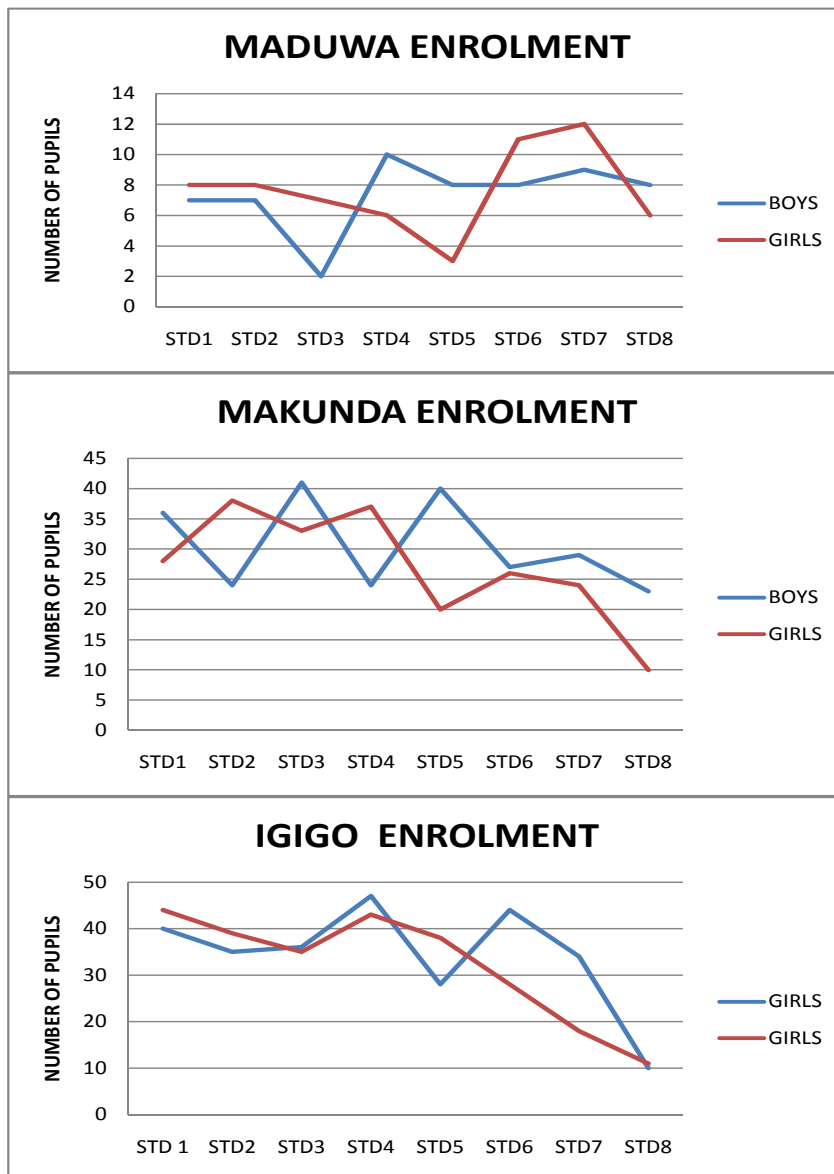
Figure 1. New responsibilities for children, affecting enrolment and gender parity: school enrolment

of immorality. People take advantage of the unsupervised children. Most children learn about sex when they are in these camps and engage in sex too early. Even those who don't get pregnant don't concentrate in class because their minds are polluted. This could be causing poor performance in this area (Parent Igigo Primary School).

In this Bunyala irrigation scheme, the dropout rate is very high. In Rwambwa primary school, children drop out to go and work in the rice fields and get some money instead of staying in school and going to sleep hungry at home. On the other side of the river, boys leave school to become fishermen. They are forced by circumstances. During floods, the children's families remain with nothing

and the only option is fishing (PTA chairman, Rwambwa Primary).

In this school, there is a high dropout rate and early marriages attributed to flooding. Most of the couples are standard seven boys who marry class five girls. Since they are unemployed, they opt for fishing (Head teacher, Igigo Primary). School children are at the greatest risk to these floods. Like in December 2011 when we had floods, by January 2012 some children were still in the camps. Their houses had been severely damaged. Some homes were inhabitable especially just behind the dykes. Even if the school is a host centre like Budalangi primary here, no learning goes on. This negatively affects curriculum implementation. At other times the floods

come when KCPE is in progress. Pupils are forced to sit for exams in host schools which are also IDP centers. This strange environment is not a conducive atmosphere for exams. It affects their overall performance. To make matters worse, at that time some children are separated from their parents who should be taking care of them and supporting them. It makes the performance poor since the children are stressed. Also the hosting schools are usually congested and facilities overstretched. Psychologically it affects the child who is a learner. This eventually leads to poor performance (DEO Bunyala District; Head teacher, Budalangi Primary School).

The floods have lead to high dropout rate evident in our records that you can see here. The trend in Budalangi flood plain is such that the enrolment rate is high but as the children reach class 6, the dropout rate is very high especially for the girls. I can say that this trend is made worse by the socio-economic position that children find themselves in. they are forced to go out of their way to fend for their families through activities like fishing, child prostitution and other income generating activities. Apart from property, the children's life in IDP camps is distressing. Normal family life is disrupted. For example, our office had many reports of girls dropping out of school due to pregnancies, many of which they got while in camps.

In the camps, the close interactions the pupils have with people coupled with lack of supervision of the children due to family separation gives them too much freedom to indulge in immoral behavior. In the camps there is no privacy in those taurblins. A parent has to talk to a neighbor to allow the daughter to sleep in the next tent. You can't know what will happen to your daughter in such circumstance. In the process, parents lose control of their children. Thus lack of parental monitoring and control. I can also add that culture and poverty influence these trends of high girl-child dropout rate. When the family livelihood is destroyed, priority is given to boys to continue with education while girls are married off (DEO, Budalangi District).

New responsibilities for children, affecting enrolment and gender parity

School enrolment dropped, especially among girls. Some are reported to have dropped out due to pregnancies and others to become child prostitutes at Port Victoria. Others due to th3e miserable life of their parents at home drop off to go to be child minders in towns so that they can send income home. On the other side of the flood plain where rice is grown, the children drop out to do child labour in the fields or join fishermen. Again, one of the parents alluded to the high dropout rate to destruction of livelihoods and life in the IDP camps. The children get exposed to immorality in the camps due to no supervision by their parents. In Narok, several studies done allude to

the high illiteracy rate to illiterate parents, culture that does not favour education of girls, gender reproductive roles that burden pastoralist women and girls, early marriages, food insecurity in these areas(Mukuna,2013a; Njiru,2013;).

Death or injury of parents or caregivers, or simply loss of family income, forces children to take on new responsibilities, such as looking after younger siblings, or to adopt new livelihood responsibilities. Loss of housing and harvests/ land forces disaster-affected families to relocate, causing disruption to children's education, as well as making families rely on their children for greater support with household chores and income generation activities.

It is true… the relief food is not enough. In fact we starve in these camps. Our children suffer more. The relief food in IDP camps is not like the relief food given to refugees' camps where there is standard provision of food. Here the government talks of providing relief food which is maize, beans and cooking fat. That lasts for only three weeks yet we stay in the IDP camps for at least 8 weeks. After providing the relief food, we are forgotten for a month. This causes untold sufferings to the families. Children often despair and drop out of school to engage in child labour, fishing or to do activities that their parents are expected to do as parents look for food. This also affects their academic performance (Parent, Mudere Primary School).

Lost school days owing to climate change impacts on morbidity

Climate change puts more children at risk of malaria and dengue fever. Increases in rainfall, temperature and humidity will favour the spread of malaria transmitting mosquitoes, which could 'put 220 million to 400 million additional people at greater risk of the disease that kills about 1 million a year'. Additionally, reduced water availability as a result of climate change inhibits provision of school sanitation, often meaning menstruating girls have to stay at home.

Whenever we have climate and weather related problems, children become more vulnerable because their immunity system is very low. At times, they may not be able to withstand the harsh climatic conditions. They develop malaria, scabies, pneumonia, dysentery, choleria amoebiasis etc. the water wells usually get contaminated and this low quality water increases the children's vulnerability (Parent, Igigo Primary School).

After the floods there are a lot of challenges in schools for example the infrastructure in the school is destroyed. Children are not able to get the same facilities that they had earlier; for example toilets collapse, water wells are contaminated, classrooms have cracks or are tilted. All these are health hazards to the children (Head teacher, Rwambwa Primary School).

Impacts on school facilities

If schools are damaged as a result of a disaster, children are left without a place to learn. With no plans for an alternative location or facility, children may be excluded from school for prolonged periods of time and in great numbers .The increased strain from damages and economic losses resulting from disasters is set to exacerbate problems in already under resourced education systems, and calls for a greater focus on relevant education to ensure future generations have the skills to adapt to climate change.

Floods destroy human life and livestock, damage personal property and rural infrastructure. This is a big setback to development programme in this area. For example, look at our classes and toilets, they have big cracks and can collapse any time. We are yet to repair them and soon we shall have more floods… (Head teacher Rugunga Primary).

Psychosocial impacts on students, teachers and staff

Without knowledge of the hazards associated with context-specific disasters and vulnerabilities, and without risk reduction literacy, school communities can fall into perpetual cycles of incapacity, where low levels Interruptions to students' education and learning trajectory could reduce their confidence and hopes for a promising future. Without psychosocial support, post-traumatic stresses can also inhibit some children from refocusing on their studies long after a disaster event has passed. of functionality block proactive prevention, protection and response to catastrophes.

During floods, children become more vulnerable. When their schools are submerged, the children are forced to move to schools in higher grounds. When they get to these hosting schools they lose self-esteem which makes them more vulnerable. They can't concentrate in their classrooms. The teachers also suffer the same loss of identity, stigmatization and loss of confidence. Their sense of ownership and prestige of being in their own schools is lost. They develop an inferiority complex which demoralizes them to perform to

the best of their potential. This movement in general impedes the effective implementation of the curriculum. The syllabus is not covered well in time (Head teacher, Sibuka primary school).

I think hunger is a major problem that affects our children's learning in the IDP camps and immediately after. We had a feeding programme for our school in the flood plain when Hon. Gumo Fred was the Assistant Minister for Education but nowadays we do not have. This school feeding programme kept our children in school. Even during floods, at least they concentrated because they had food (Parent Budalangi Primary School).

We don't know whom to blame for our suffering. Our children's education gets affected adversely. The teachers who are posted to this area run away because of suffering. In fact most of the ones teaching in these schools are here on disciplinary grounds. They regard it as a punishment and don't focus on their work. Even teachers absent themselves very much. The high turnover of teachers depresses the learners (Parent Mukunda Primary School).

During evacuation in schools, teachers, parents and pupils collaborate to pack most of the crucial teaching and learning facilities. The teachers are also traumatized. At first, they save lives, then property. Female teachers especially opt to transfer to other stations. It is not automatic that when one is transferred, a suitable replacement is got. This means that children end up being untaught. There is a lot of trauma and stigma for teachers who teach in Budalangi flood plain (Head teacher, Bugunga Primary School).

In St Annes' Girls' School, most of the students lost their property. Their parents are too poor to replace the lost property. Partners have brought them mattresses and blankets to replace their lost property but the attachment they had to their former property traumatizes them (DEO, Budalangi district).

Missed opportunity to offer stability and hope in times of crisis

Education in emergencies is a necessity that can be both life-sustaining and life-saving, providing physical, psychosocial and cognitive protection. It sustains life by offering structure, stability, and hope for the future during a time of crisis, particularly for children and adolescents,

Figure 2: A Spider Web Illustrating the Holistic and Integrated Approach of DRR into MDGs
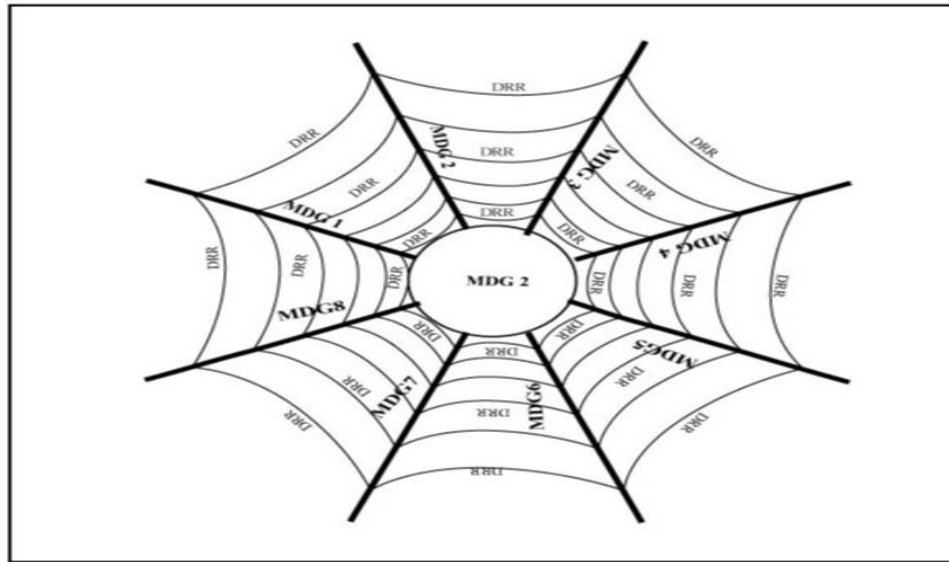
Source: Authors' Conceptualization

and provides essential building skills, and supporting conflict resolution and peace building' (INEE, 2008). All girls and boys have a fundamental right to both education and safety under the UN Convention on the Rights of the Child. Equal access for all children to quality and relevant learning and to safe schools is a growing development challenge, one that is exacerbated by climate shocks and other stresses. Ensuring education continuity within a safe, resilient environment is of utmost importance. Equally essential is that the post-2015 education targets and indicators focus on relevant and quality learning that will equip students with CCA and DRR skills that will be of use for their future families and livelihoods (UNESCO, 2012).

CONCLUSION

In this chapter, we affirm that education can be a cost-effective approach to proactively building DRM and resilience in communities. It provides sectoral, widespread reach and systemic sustainability for climate smart DRR awareness raising, knowledge and skills development. The HFA acknowledges the role of education in solving the global challenge of climate change and disasters and calls for the use of knowledge, innovation and education to build a culture of safety and resilience at all levels. Education plays an instrumental role in DRR. Evidence shows that investments in climate change education, including DRR, can change both perceptions and behaviours of a community (PISA, 2006). Individual's attitudes and behaviours with regard to the environment are likely to be the result of multiple factors, including knowledge, awareness, attitudes and social expectations.

The post-2015 agenda is the ideal place to emphasize education for sustainable development. The Global Campaign for Education US Chapter (2013) states, 'as the world envisions global challenges beyond 2015, certain crosscutting issues come into focus; Economic stability and youth unemployment, security and conflict, climate change and environmental sustainability. Education is at the centre of all of these leading global challenges and their solutions.' We have suggested additional indicators for the MDGs which will ensure that DRR has been integrated in the post 2015 development agenda for sustainable development. This is in a bid to give the evaluation reports a Human Rights Based Approach. We have also proposed a framework of integrating DRR into the school curriculum with a view that MDG 2 is the focal point of the spider web of all the MDGs and their stated targets and indicators. This will fill the gap in knowledge on the underlying causes of risk, connect DRR and climate change to sustainable development policy and planning and help the Kenyan government to link policy to practice. Figure 2 above illustrates this.

RECOMMENDATIONS

This study has recommended two approaches to Sustainable Development Goals; firstly, methodological frameworks for integration of disaster risk reduction into the school curriculum. The framework is presented as Figure 3 below.
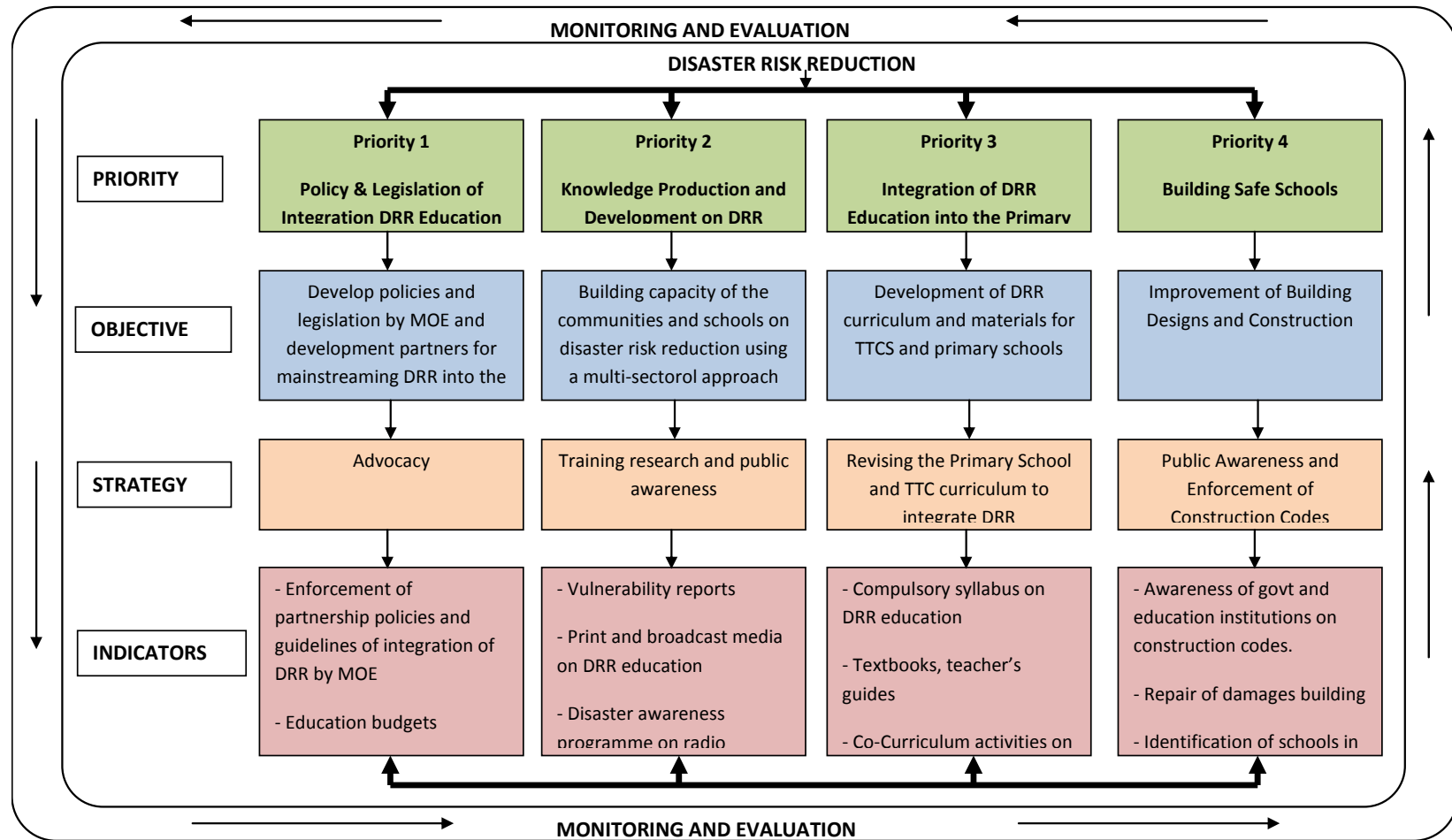
Figure 3: Proposed Methodological Framework for Integration of DRR Education into The Primary School Curriculum
Source; Authors own

Priority 1: A Comprehensive Policy and Legislation on DRR Education

This research has shown a direct link between the political will to transform the primary school curriculum and integrate DRR education for sustainable development, poverty reduction and reduction of people's vulnerability to disasters. This is therefore the top priority of this framework. Political commitment drives the political process that enforces and enacts all policies, legislations, strategies and guidelines. These guidelines lead to planning the integration of DRR education into the school curriculum. Kenya has made commendable

progress towards implementation of Hyogo Framework for Action as earlier mentioned but from the findings of this study, a gap still exists between policy and practice. The political will needs to drive the legislative process at the county and school levels. Since DRR is a multi-sectoral endeavour, the legislation should ensure that DRR is mainstreamed in all policies and laws.

Apart from formulation of policies, political commitment will ensure budgetary allocation to fund the said activities. Finances make it possible for different role players to engage in disaster risk activities. This is a great enabler to the disaster risk reduction process. A cost - benefit analysis should be done leading to spending. Policies on safety of schools and the children's families will ensure risk assessments as well as vulnerability and capacity assessments and analysis. All these will provide information on the livelihood practices of the community. The risks will be identified and monitored. Rewards and punishment will follow schools that ensure the safety of the children.

For disaster risk reduction to be integrated into the primary school curriculum, first and foremost there is need to have a comprehensive policy on DRR education by the Ministry of Education and her developmental partners. The policy should highlight the need for integrating DRR into the national curriculum and assign responsibility to the MOE. The National Disaster Management Committee should provide technical support to the MOE as well as provide funding for the project. The NDMC together with MOSSP should advocate for integration of DRR into the school curriculum to generate political will in initiating such integration.

Priority 2; Knowledge Production and Management

Knowledge management concerns the entire process of creating knowledge through research, exchanging knowledge and using knowledge. Education, training and research form the foundation towards knowledge management and production. Good practice of knowledge management helps to reduce risks of disasters by increasing the level to which people are informed and motivated to participate in a culture of disasters prevention, mitigation and recovery. Disaster risk reduction is a cross-cutting issue that requires multiple disciplines working together in innovative ways of gathering, organizing, sharing and analyzing knowledge in the sector. Research should focus on the livelihoods, human rights and dignity, climate change, social protection of community members, public health and natural hazards. Enforce community participation in disaster management by educating the community on their vulnerability assessment, risk assessment, census data on the affected and their needs, aerial maps on the land use practices in R. Nzoia's catchment area and

climate data. The disaster risk reduction education should ensure that they use the sex disaggregated data on vulnerability so as to enact and enforce policies and legislations that are gender sensitive. Public awareness and community involvement in monitoring the integration of DRR education into the school curriculum should adopt an advocacy strategy. This advocacy goes beyond the global and the regional boundaries. It is recommended that curriculum experts should form partnerships and linkages with relevant stakeholders and explain the urgent need for the curriculum change so that we realize the MDGs and move towards sustainable development. Disaster risk reduction climate change adaptation and social protection needed to be integrated and mainstreamed in all developments policies. This is because all the three domains focus on the vulnerability of a population to a variety of shocks and stresses. The integration will effectively reduce vulnerability than working in isolation. This will build up a synergy that will lead to cross-disciplinary joint planning implementation and learning. This will help stop reinventing the wheel whereby there will be shaming of knowledge and bringing flexibility into the design of existing programmes. This integration will also lead to a human centred approach to addressing problems of the poor populations community centred approaches through DRR social protection and climate change adaptation will lead not only to reduction of poverty but build resilient communities climate change disasters risk management and social protection create a real nexus of crucial issues for example social, political, institutional technical and ecological aspects and dimensions of vulnerability.

Social protection, climate change, adaptation and disaster risk reduction have interventions that will lessen the impact of shocks and stress on the poor communities. A cross-fertilization of climate change adaptation and disaster risk reduction with social protection and climate change adaptation is recommended. The MOEST should also provide guidelines on climate change adaptation and disaster risk reduction at school levels. This will direct integration of climate change adaptation into school lessons.

Priority 3; Integration of DRR Education into the Primary School Curriculum

To achieve the core objective of the Hyogo Framework for Action of using knowledge and education systems to build a culture of resilience at all levels, the Kenyan government, through the Ministry of Education, cannot ignore the opportunity that schools and education offer in reducing the risk of hazards and disasters. Numerous examples across the globe show that children are more vulnerable to disasters but, at the same time, they can be influential and effective communicators about disasters. Often, lessons learnt at school are later transmitted to the

home. There are many other documented occasions when the safety of a family or the protection of element of the household has been traced back to a safety lesson learned at school. Introducing disaster awareness and risk reduction education into the school curriculum would foster better understanding amongst the children and the teachers about their immediate environment in which their families live and would help reduce the risk faced by the community.

To integrate DRR education into the primary school curriculum, this study has recommended that the national education working group together with K.I.C.D and other relevant departments under the supervision of K.IC.D basic education division should initiate the review of the existing curriculum *vis-à-vis* the natural hazards that the country is exposed to. It should consider the potential social, physical, psychological and economic impacts of disasters in order to assess the needs for DRR integration in the education sector. Based on the results of the needs assessment, appropriate school subjects and class levels are then selected for integration. K.I.C.D using developmental appropriate learner-centered criteria should select what to be taught to whom. K.I.C.D should also identify pedagogical strategies thus classroom activities and content of teaching which teachers can use in the delivery of the approved teaching materials and reference materials on DRR education.

It is recommended that the integration of DRR education into existing subject of the primary school curriculum should allow special subjects to be based on the local needs and potentials. This is because of the country's exposure to many types of natural hazards and disaster risk profile. Subjects to integrate with DRR education include mathematics, English, Kiswahili, social studies, religious education and science. DRR education topics can include vulnerability, social awareness of disaster risk, keeping the environment safe, disaster prevention, preparedness, evaluation of disaster impacts. The integration of disaster risk reduction education into the primary school curriculum is urgent as the reconstruction of knowledge and experience systematically developed with guidance of the school or relevant devices which will enable the learner to have better mastery of learning experiences for his/her society.

Priority 4: Building School Resilience to Disasters

The findings of this study revealed that most primary schools in Budalangi flood plains were not safe for the children and their teachers. As earlier mentioned, policies on safe schools should be enacted. The damaged school buildings should be retrofitted and repaired to meet construction standard codes. School disaster management plans, indicating evacuation centers should be drawn. This study recommends that schools should be used as outreach centers of DRR education, build the capacity of teachers, parents and instructional

supervisors on DRR education, and train the communities on DRR education to reduce their vulnerability to disasters, assess poverty reduction strategies, embrace social protection and climate change adaptation measures and train masons to build strong school. We recommend invigoration of micro-finance institutions that have subsidized credit facilities for this vulnerable community. They need to educate the community members on alternative livelihoods and entrepreneurial skills. We also recommend zero-tolerance to corruption and implementation of legislation for contractors to curb shoddy jobs done by them.

The second recommendation is a list of indicators that will give a holistic and integrated view as a contribution to the post 2015 development agenda. In our view, achievement of MDG 2 is supreme and therefore the proposed indicators should be included in its provision and measurement of the achievement or progress. All the data should be gender disaggregated factoring in human rights, age, sex and disability. These targets and indicators are presented in box 1 below.

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Box 1. Targets and Indicators for a Holistic and Integrated assessment of Achievement of MDGs and Hyogo Framework for Action

-Net enrolment in primary, secondary and tertiary institutions
-Gross enrolment in primary, secondary and tertiary institutions
-Gross completion rates at primary, secondary and tertiary institutions
-Net completion rates at primary, secondary and tertiary institutions
-Literacy rates of 15-24 year old men and women
-Adult literacy rates
-Adult illiteracy rates
-Number of children displaced by natural and man-made disasters
-Number of children and teachers killed in schools due to man-made and natural conflicts
-Attendance rates of learners and teachers
-School transition rates
-School dropout rates
-Child; teacher ratios
-Child ;text book ratios
-Number of children out of school or who have never attended school
-Absenteeism rates of learners and teachers due to natural disasters
-Number of contact hours between learners and teachers
-Number of learning spaces available
-Number of teachers trained
-Number of teachers trained or undergoing in-service training on DRR
-Training of education administrators and managers on school governance
-Socio-economic status of learners(income of families)
-Context of the learners i.e geographical location
-Protection of children from child labour
-Type of support for children with special needs or disabilities
-Number of curriculum that has been integrated with DRR
-Teacher professional development on DRR
-Teacher training for effective pedagogical practices
-Safety of learning environment including building codes, site analysis and retrofitting
-Financial allocation to the education sector including a budget for DRR education
-Equitable funding for school infrastructure
-Child nutrition and health
-Health education in schools
-Family health relationships education
-Ratios of boys to girls in primary, secondary and tertiary education
-Share of women in wage employment in the non-agricultural sector
-Proportion of seats held by women in parliament
-Curriculum content with Environmental awareness in schools e.g climate change literacy and green technology; critical thinking and problem –solving skills; respect for the earth's natural resources; indigenous knowledge; life skills education; prediction, prevention and preparedness of disasters; evacuation drills; early warning signs of disasters;
-Knowledge about HIV/AIDS,TB and Malaria
-Protection of children from Gender-based violence at school
-Culturally responsive gender-sensitive learning environments
-Gender equality
-Gender parity in school enrolments
-Access to water and sanitation in schools
-DRR plans at school, district and county levels
-School open days on DRR
-Informal(Vocational) education for out of school children
-Youth and child clubs on DRR for public awareness

Box 1. Continue

-Review of term dates for children in fragile ecological zones to cover for lost time

-Lowering of pass mark for children in fragile ecological zones to facilitate transition rates and reduce dropout rates

- Identifying marginalized learners and making education more affordable for them e.g abolishing school fees; providing subsidies for   textbooks ,uniform, meals e.t.c; provide schools through innovative means such as mobile schools, distance learning, education in emergencies and targeting rural children, children from poor families and slum holdings, pastoralists, orphans and vulnerable children and migrants.

-Enforcement of partnership policies and guidelines of integration of DRR by MOE

- Audit by MOE on skill development in DRR education

- Vulnerability reports

- Print and broadcast media on DRR education

- Disaster awareness programme on radio