

Reducing Vulnerability of the Rural Poor Through Adaptation and Mitigation

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Abstract

Goal 1 of the 2030 Agenda for Sustainable Development commits to end poverty in all its forms. Among other things, this entails a total transformation of at least 10% of the global population that are in extreme poverty. The poorest people on the planet are mainly those that live in rural areas and are largely dependent on agriculture and other climate sensitive activities for their livelihoods. Compounded with inadequate resources to cope with and adapt to climate related shocks, their lives, assets and livelihoods remain highly vulnerable to climate vagaries and related shocks. This paper reviews adaptation and mitigation strategies that are currently being deployed in developing countries to reduce vulnerability with a focus on poverty reduction. To enhance efficiency of these strategies, the paper recommends regional cooperation for early warning systems; good balance between available resources and targets of the social safety nets to ensure sustainability; and integration of insurance component into social protection programmes.

1. Introduction

The 2030 Agenda for Sustainable Development commits to reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions and to completely eradicate extreme poverty. From the monetary perspective, the extreme poor are defined by their ability to live above the threshold of \$1.90 a day. Currently, at least 2.1 billion people globally are in poverty and at least 736 million people (10%) of the global population lives below this poverty line (Castañeda et al., 2018; FAO, 2018). These are largely comprised of rural dwellers with little (if any) formal education, mostly residing in high risk areas such as river banks and flood plains with homes made from very poor-quality material and are mainly dependent on natural resources including rain-fed subsistence agriculture for their livelihoods. The latter makes them highly vulnerable to climate change and related shocks including erratic rainfall patterns, floods, droughts, dry spells and windstorms.

Corollary, these climate related shocks are seen to further deepen their poverty as they have a direct negative impact on their lives and livelihoods (Erikisen and Obrien, 2007). For instance, dry spells will entail reduction in their agricultural production which threatens their food security and undermines their income; these might result in poor nutrition and health as well as access to farm inputs during agricultural seasons. On the other hand, shocks like floods will include loss of assets and thus further undermining their income sources and perpetuating their poverty. In essence, the impacts of climate change are largely felt through erosion of natural resources which are the backbone of the livelihoods of the majority of the rural poor. In this regard, it is worth noting from the onset that though closely linked, poverty and vulnerability are not the same and as such, strategies for addressing them might be equally different. However, neglecting the impact of climate variabilities and climate change related shocks on the poor and vulnerable groups, remains redundant in effective poverty reduction.

Ensuing the above, this paper highlights strategies that will effectively contribute to the achievement of sustainable development goal 1¹ of the Agenda 2030 by addressing vulnerability of the rural poor to climate change through adaptation and mitigation. The focus is on best practices and lessons drawn from developing countries to effectively inform the Agenda 2030 implementation and national policies and strategies.

2. Vulnerability in the context of climate change and poverty reduction

Definitions of vulnerability to climate variability and change in literature generally encompass two key dimensions: the risk (shock/hazard) and its impact; and the capacity to mitigate, cope and adapt (O'Brien et.al., 2004; Erikisen and O'Brien, 2007; Brouwer et.al., 2007, Emrich and Cutter, 2011). Simply, it is defined as the inability of an individual or groups to anticipate and mitigate, cope with and recover from the impact of a climate change related shocks (IFRC, 2019). Overall, vulnerability to climate change is seen to disproportionately affect the poor owing to a number of social, economic and physical factors that increases their exposure to the impact of climate change shocks but at the same time limits their capacity to cope and adapt (Andrianarimanana, 2015; Nelson et. al., 2016; FAO,2018). For most of the rural poor, these are a combination of limited livelihood options, access to public services such as health care,

¹ End poverty in all its forms everywhere

adequate assets to enhance their productivity and relevant economic infrastructure. Specifically, their overreliance on climate sensitive activities such as agriculture for their livelihoods continuously threatens sustainability of these livelihoods. This is further exacerbated by their settlement patterns which includes disaster prone areas with poor quality houses; poor access to relevant information and resources to equip themselves against potential shocks as well as recovering from such shocks.

In their study, FAO (2018) highlights that at least 75 % of the world's extreme poor resides in the rural areas and highly depend rain-fed subsistence agriculture for their livelihoods and food availability. This poses a huge risk of poverty perpetuation as the sector is seen to absorb at least 25% of the damage caused by climate change in general and up to 80% of the losses are due to disrupted rainfall patterns such as drought and dry spells (FAO, 2018). This is in line with several empirical studies on the impact of climate related shocks which highlights its higher impact on the poor households vis -a-vis the wealthier. Such studies include, Andrianarimanana (2015) who notes a 2.4% decrease in access to electricity only on the poor households following a cyclone in Madagascar. This author also concludes that the cyclone had significant negative impact on their assets and income and raised their likeliness of falling deep into poverty by 7.8%. Furthermore, Herera et. al. (2018) observed that the poorest in Nicaragua had lost 18% of their assets and additional 165 million people had joined the extreme poverty category following the Hurricane Mitch in 1998. Lastly, FAO (2018) observed three times losses among poor households in relation to the rest following a flood in Mumbai in 2005. With the current high frequencies of climate change related shocks, these trends entail even higher losses for the poor households and without any buffering for their incomes and livelihoods, the recurrent losses in the assets and livelihoods have potentially irreversible long-term impact on their poverty levels.

In distinguishing poverty and vulnerability, Erikisen and O'Brien (2007) noted that a poor person who is well prepared for climate change related shocks through good access to timely relevant information, mitigation and adaptation measures for example, is less vulnerable than a wealthier person who is not prepared for such incidences. In essence, they allude to the fact that poverty and vulnerability to climate change are not one and the same with a possibility of being poor but not vulnerable (be able to effectively cope and adapt) to climate change shocks with its associated risk of being pushed deeper into the poverty trap. On the contrary, trends in most developing economies indicates that the poorest are the least prepared in terms of climate change shocks/hazards and hence, they continue to experience the heaviest impact. Specifically, they lack access to sustainable climate change mitigation and adaptation measures due to their low levels of incomes, poor access to relevant economic infrastructure and limited livelihood options *inter alia*. With increased frequency of shocks, the poor resort to adhoc coping measures which includes further loss of their assets through desperate sales for consumption. These measures are unsustainable, and they significantly contribute to pushing them further into the absolute poverty trap.

Clearly, the above insights suggest ensuring access to sustainable mitigation and adaptation measures is key to addressing the poor's vulnerability to climate change related shocks. This calls for an understanding of the poor in different regions in terms of their key livelihood options and access to essential socio-economic amenities and infrastructure in relation the climate related shocks they are mostly subjected to. This reckons the fact that not all extremely poor people depend on agriculture for their livelihoods (Castañeda et.al., 2018:256); and that different regions face different climate related hazards. Hence some appropriate mitigation and

coping strategies in one region might not be useful in reducing vulnerability to climate and effectively contribute to poverty reduction in another region.

3. Adaptation and mitigation: Best practices

In simple terms, adaptation is perceived as the change in the processes, practices and structures to moderate damage from climate change related shocks. On the other hand, mitigation largely deals with the changes in the systems and practices to reduce the severity of the shock. For effective sustainable adaptation and mitigation strategies, the starting point is stratification of the rural poor in relation to the common known and anticipated hazards, and strategies that are currently working in these areas and scale them up. This section provides such strategies drawn from developing countries.

3.1 Mitigation

As highlighted above, mitigation is more about reducing the gravity of the shock. It uses policies and strategies that focus on reducing vulnerability to climate change related shock by equipping communities/individuals with relevant information including the gravity and time of the pending hazard. This is envisaged to assist in planning on how and when to react so as to minimize the impact on the lives, assets and livelihoods of the potentially affected communities to the minimum possible levels. In other words, mitigation focuses on reducing exposure of the poor's lives and assets to the risk and greatly minimises sensitivity of the livelihoods to climate change related shock. Currently, mitigation strategies being adopted in most developing countries include early warning and climate smart agriculture.

3.1.1 Early warning Systems

Early warning systems are essentially set to empower threatened communities with timely relevant information so as to reduce the impact of the looming hazards on their lives and property. Through functional weather centers, most countries have access to weather information including pending climate related hazards. However, without effectively integrating such useful information in the planning of the local communities envisaged to be affected by the hazard, lives and property of the most poor and vulnerable groups continues to be at stake. In this regard, an effective early warning system goes beyond weather forecast and warnings of climate related hazards to include effective planning and implementation of strategies aimed at averting worst impact from such disasters.

Mozambique is one of the countries in Southern Africa that is prone to floods, cyclones and droughts with significant impacts on the lives and properties of the poor and its overall economic growth. The worst climate change related disaster in the country are devastating floods that were followed by cyclone eline in 2000. The floods affected the lower Limpopo river basin and affected about 1400km² of arable land, displaced thousands and claimed about 800 lives with losses monetarised to an equivalent of US\$450 million (Nigg and Mileti, 2015; GIZ, 2017). Among the issues learnt from this disaster was the importance of a functional early warning system that would lessen the impact of such disasters in the future. This has gradually seen the country moving from emergency response to effective planning that starts with functional early warning systems. Their focus has been placed on disaster prone areas including

lower Limpopo river basin where one of the early flood early warning system was installed few years after the floods.

The system was developed jointly by the government of Mozambique (Lower Limpopo River Commission) and SADC and it has been revolving over the years to improve its efficiency as regards flood alerts recording and dissemination. One of the key features that has changed over the years to improve its efficiency was the manual recording and dissemination of relevant information from the key station to the responsible government agency. The system has two main components that are managed by relevant government agency: the hydrometrical monitoring network and the communication system that operates using both radio transmission and telephone network. Automated real time information from the hydrometrical network is commuted through radio transmission to the basin's commission and through mobile short messages (sms) to its disaster management committee. The committee is empowered to pass on the alert messages to the basin's community and implement mitigation measures including relocations (if necessary) and work on an appropriate emergency response plan (IFRC, 2007).

Among other things, these measures have seen significant reductions in the impact of similar flooding disaster that occurred in 2001 in the Zambezi basin and in 2013 where people were warned and were able to prepare for safety in advance with minimal impacts on the lives and assets of the affected population. However, a lot more needs to be done particularly to integrate it with South Africa's early warning system and possibly integrate the systems at the regional level (SADC). This is essentially from the fact that despite experiencing floods in most years, the lower Limpopo basin in Mozambique experiences a lot of droughts. The source of the floods is the upper Limpopo stream in Botswana and South Africa that receive more rain than this region. For example, the region had floods in 2013 whilst going through a drought patch. Such events potentially beat the effectiveness of a good system and as such, it remains imperative to integrate the systems in the whole region.

Key lessons

- i. Direct involvement of the communities concerned in the dissemination of the relevant information increases the viability of these systems. Specifically, this system was bound to flop in reaching the extreme poor if the national broadcasting stations (radio and/or television) were used to disseminate the looming disaster information as the poor can hardly afford radios or television sets.
- ii. Strengthening regional cooperation in managing climate change hazards is crucial as clearly from the 2013 floods in Mozambique, national boundaries are insignificant in the face of such shocks. Integration of early warning systems at the regional level will have a greater impact on the vulnerability of the poor and hence poverty reduction than fragmented national systems. However, this would require huge investments and high levels of political commitment from the respective national governments.

3.1.2 Climate Smart Agriculture

Climate smart agriculture is another strategy that has proved to effectively reduce vulnerability of the poor to climate change shocks. It holds both as a mitigation and adaptation strategy to climate change as it encompasses several aspects of the two.

Complementing the early warning system in Mozambique's lower Limpopo river Basin is the Massingir Dam which serves both as a reservoir in the event of a drought or as a buffer (flood

control) in the event of an overflow of the Limpopo river due to heavy rains and thus, mitigating the impact of the possible drought or floods on the vulnerable communities downstream. The basin is of high importance to the country both at the community and national level for poverty reduction and economic growth owing to its agriculture growth potential. At the national level, the basin has great potential to contribute to improved food security and growth through irrigation. Unlocking the irrigation potential and managing flood incidences, Massingir dam benefits the poor more by reducing the vulnerability to seasonality changes that was compounded by their overreliance on rain-fed agriculture. In addition, exploring possibilities of out-grower irrigation schemes will further reduce the vulnerability of the poor people due to additional incomes and livelihood options. While wealthier smallholder and large-scale farmers pay for the utilisation of the water from the dam, the inclusion of the extremely poor and vulnerable household in irrigation farming is secured through free access to the water and provision of irrigation equipment by the government.

Similar irrigation projects have been running in Malawi over the years including the Smallholder Crop Production and Marketing project (SCPMP) which had a life between 2007 and 2013. Despite being rich with fresh natural water, the majority of the poor people in Malawi are highly vulnerable to erratic rains and dry spells/droughts which significantly disrupts their yields and hence income and food. The main components of this project included the development of 39 small-scale irrigation schemes and provision of 1,140 treadle pumps to its targeted beneficiaries across the country (AfDB 200). Under most of such projects in the Malawi, the poor households have access to irrigation equipment through farmers groups or associations whose membership is largely determined by the objectives of the project.

These two irrigation scheme models effectively support Erikisen and O'Brien (2007) dispositions that just as poverty and vulnerability are not one and the same, not all measures for addressing vulnerability will have a viable impact on poverty reduction and vice versa. While Lower Limpopo irrigation schemes are supported by the Massinger dam, the irrigation schemes in the SCPMP directly depended on the rivers for their water. The former model is ideal both as a flood control mechanism and ensuring availability of water for irrigation throughout the year with or without drought. On the other hand, sustainability of the latter is compromised in events of droughts especially when the water levels in the river are significantly affected. In the event of floods, the SCPMP infrastructure is at risk of being destroyed and so are the assets and lives of the poor people in the projects area. In other words, while this model is effective for poverty reduction through increased incomes and livelihood options and improved food security, it is not a mitigation option for reducing vulnerability of the poor to climate change related impacts with their associated risk of perpetrating poverty. However, it is worth noting that this model is a viable adaptation option in the event of floods assuming the irrigation infrastructure is not destroyed.

Key Lesson

Initial investment costs are much higher under the irrigation systems that are supported by well-developed water reservoirs such as the Massingir dam when compared to the SCPMP model. However, these costs are more than outweighed by the benefits drawn from such investments in the long term. As highlighted above, the water reservoir provides assurance of reliable water flow throughout the year and thus enhances effective planning and enhanced productivity of irrigation farming. On the other hand, availability of water for irrigation under other models that relies on the natural river flows remains compromised by climate variability and climate change related shocks that negatively impacts on the flow of the respective rivers. Secondly, sustainability of irrigation equipment such as dikes also remains under threat to climate change

shocks under models such as the SCPMP model and so are the lives, assets and livelihoods of the poor beneficiaries of such programmes. Thus, in the long term, both the economic and financial costs of models that depend on the natural river flows are much higher than those that have good structures such as the Massingir dam. Furthermore, while both models focus on poverty reduction by reducing the poor's dependency on rain fed agriculture, the SCPMP model does not effectively reduce vulnerability of the poor to the impact of climate change and climate variability shocks and as such, its effectiveness is highly sensitive to the same factors.

Overall, climate smart agriculture provides a wider range of mitigation and/or adaptation measures to climate change related shocks. These include irrigation farming as highlighted above, planting of indigenous trees to curb degradation of land and use of early maturing varieties of the relevant crops. As such, it is imperative to understand which measures directly tackle vulnerability to climate change with an impact on poverty reduction.

3.2 Adaptation

Adaptive capacity is defined as the ability to effectively adjust and respond to and learn from (potential) shocks/hazard (IPCC, 2014). Effective adaptation is generally perceived as an ongoing and flexible process that builds on the current coping mechanisms to climate variability and extreme events. Focus is on their socio-economic sustainability both in terms of resource use, contribution to vulnerability and poverty reduction as well as environmental management (World Bank, 2002; Twyman, 2005). Safety nets are the most employed adaptation measures at the national level to reduce vulnerability of the poor to climate related shocks. Their focus is on providing the poor with alternative livelihood options as an effective means to cope with and adapt to climate related shocks. While some measures are sustainable and accords the poor a long-term perspective of effective livelihood planning, most focus on short term relief particularly in emergency which are not self-sustaining in the medium to long-term particularly when compounded with increased frequency of climate related shocks. This section discusses three different forms of safety nets that focus on reducing vulnerability and alleviate poverty in developing countries.

3.2.1 Social cash transfers programmes

Social Cash Transfer programmes (SCTP) focus on increasing incomes of the extremely poor households as a means of reducing vulnerability and poverty alleviation. It is a regular (monthly or quarterly) transfer of cash that provides the poor households with an alternate reliable source of livelihood. These can be conditioned or unconditioned depending on the anticipated outcomes and targeted beneficiaries. In most developing countries however, unconditional cash transfers are common as the targeted population is the ultra-poor who cannot provide labour and their access to productive assets such land is limited. Unlike conditioned programmes, these are seen to be prone to abuse by the beneficiaries as they are not bound to use the cash for intended purposes and there is no control on their behaviour following receipt of the cash. In this regard, FAO (2008) noted that there are several myths around cash transfers which might potentially defeat their intended objectives. These include misuse of the received cash on non-essentials such as alcohol with the possibility of encouraging laziness and perpetuating dependency syndrome. Furthermore, they are also seen to be inflationary and thus counterproductive in poverty reduction.

Contrary to these views, Vincent and Cull (2009) found that social cash transfers in Southern Africa played a significant role in reducing vulnerability of poor households to food insecurity and malnutrition. By providing the poor with regular income, the programmes empower them to increase their productivity through investments in productive assets and employment of labour; increase their access to social services and in the event of climate related shocks, it reduces their vulnerability by giving them alternate livelihood options.

3.2.2 Public works programme

Public works programmes provide good example of conditional cash or food transfer programmes where beneficiaries provide labour for cash or food. As a safety net, beneficiaries are generally employed for relatively short periods so as not to deprive them time engage in other productive activities. Nevertheless, this arrangement does not accommodate the extreme who are physically incapable to provide labour yet in need of bail outs from extreme poverty. In this context, countries are managing safety net in a way that combines the unconditional and unconditional cash or food transfers to accommodate such marginalised groups.

Ethiopia is one of the countries in Eastern Africa that is prone to droughts resulting in increase in its food prices with worst impact on its poor populations. This left Ethiopia as one of the main beneficiaries of emergency food aid in Africa receiving about USD 265 million per year in food aid between 1997 and 2002 (World Bank, 2009). While this was essential in helping the affected communities cope with the impact of drought in the short term, it remained ineffective in reducing vulnerability of the poor to droughts and have a significant impact on poverty reduction. Consequently, the Federal government of Ethiopia introduced Productive Safety Net Programme (PSNP) in 2005 with the main objective of reducing household vulnerability to food insecurity through conditioned or unconditioned cash or food transfers within the critical months of the agricultural calendar. The programme was run for 7 years and targeted the poor and ultra-poor households with the latter category benefiting from the unconditioned cash or food transfers as they were largely comprised of people who could not provide productive labour and had poor access to productive assets such as land. In this regard, 80% of the beneficiaries were engaged on the conditioned programme which entailed involvement in public works for either cash or food receipts (World Bank, 2011).

The programme served as effective adaptation measure in food security crisis for the beneficiaries. Literature indicates significant improvements in the incomes, productive asset ownership and consumption patterns of the beneficiary households. Among other things, this was reflected in the reduction in their distress sell of assets for food during the low months of agricultural calendar (Dicks, 2012). Furthermore, for similar programmes such as the Malawi SCLP that accords its beneficiaries a monthly stipend throughout the year, have a long-term impact on poverty reduction through increased school enrolment.

Key Lessons

- i. While the positive impacts of these programmes cannot be refuted by existing literature, the monetary value of most of these cash transfer programmes are not substantial for meaningful investments that will facilitate graduation from the poverty levels. In the case of Ethiopia in 2006, beneficiaries either received to 15 kgs of grain per month plus pulses and oil cash equivalent of about USD 0.75 per day (Dicks, 2012). This was

higher compared to Malawi where beneficiaries of its social cash transfer programme in 2006 were on an unconditional monthly stipend of USD 14 on average (Miller and Reichert, 2019). These figures were below the poverty line of \$1.25 during the implementation of the programmes. For the extremely poor households with no alternative livelihood options, these incomes were still not sufficient strategies for a significant positive impact on their vulnerability and let alone, poverty levels. Dicks (2012) observes that despite several benefits attributed to this programme, most of the beneficiaries were not ready to graduate from the programme at termination and were linked to other programmes such as the PSNP-Plus for continued support of their livelihoods among others.

These were effective adaptation measures to climate related stress on incomes and food in the short term. As such, it is imperative to scale down on the targeted beneficiaries to enhance their potency in reducing vulnerability with a significant impact on poverty reduction.

- ii. Sustaining these programmes requires a lot of financing which is not feasible for developing countries. As such, they are mostly co-financed or fully financed by developing partners. This potentially contributes to aid dependency that Africa is currently grappling with. It is therefore important to effectively account for viability of these programmes in terms of financing vis-à-vis benefits including their sustainability. One possibility is to review its prominence in the national GDPs both in terms of expenditure and incomes. This will partly entail tying the conditioned components to activities that enhances per capita GDP.

3.2.3 Climate Risk Insurance Schemes

Climate risk insurance is one of the best adaptation strategies to climate change related shocks which transfers the risk of loss to the insurer. It is best understood as “*mechanism which provides security against the loss of assets, livelihoods and lives due to climate-related risks by ensuring effective and expeditious post-disaster relief on an individual, community, national and regional level.*” (MCII, 2017). These can be administered as direct insurance where the agreement directly involves the insurance policy holder and the insurance company such that in the event of a disaster, a direct transfer is made to the policy holder. However, these limits the participation of the poor and most vulnerable groups who do not have the financial capacity to purchase the insurance. In this regard, indirect approaches are mostly utilised in targeting vulnerability of the poor to climate change and reduce the impact of weather-related shocks. Under this approach, indirect benefits to the poor are accrued from payments intermediated by an insured government or institution such as farmers association that hold an insurance. With the government as an insurance policy holder, there is a higher probability of the extremely poor and marginalised groups of the population to have access to these policies.

Depending on the nature of potential climate related hazards, Indemnity-based or weather-index insurance can be utilised. While loss assessments of the damage caused by the hazard forms the basis of the payments under the indemnity-based insurance, payments are made only after the trigger index exceeds the pre-defined threshold under the weather-based index². These can be implemented as standalone insurance schemes through the national budgets or as part of the existing social protection programmes. While climate insurance focuses only on risk transfer as a mitigation measure, empirical evidence posits that a comprehensive social

² For details of the pros and cons of each see MCII, 2017:53; Schaer L. And Waters E. (2016)

protection programme that includes risk transfer through insurance has a better impact on vulnerability and poverty levels (Schaefer and Waters, 2016).

The R4 initiative under the World Food Programme (WFP) is a good example of a weather-indexed insurance scheme that is integrated either into the existing social safety nets of the participating countries or WFP's Food Assistance for Assets (FFA) program. It was launched in 2011 with the main objective of increasing food and income security of the poor households in the face of increasing climate related shocks risk. To deliver on this objective, the approach combines 4 risk management strategies: (i) Risk reduction: beneficiaries provide labour to projects that focus on ensuring acquisition of relevant climate change mitigation assets at the community level; (ii) Risk transfer: increasing their access to the weather-index insurance helps them to transfer their risk of loss from climate related hazards; (iii) Risk Reserves: the programme accords the beneficiaries an opportunity to build a stronger financial base for investing but also as a buffer against short-term needs and idiosyncratic shocks; (iv) Prudent risk taking: by encouraging farmers to save and invest, beneficiaries are given opportunities to diversify their livelihoods as a means to reduce their vulnerability to climate related shocks. Thus, the initiative goes beyond insurance pay outs in emergency (as would be the case with a stand-alone insurance) to guarantee good investments *ceteris paribus* which potentially increases their incomes and reduce their vulnerability and poverty.

Conditional access to the insurance is mainly through provision of labour in the Insurance-for-Assets schemes (IFA) which focus on reducing vulnerability of the poor and build resilience to climate change through provision of relevant assets such as irrigation tunnels or small-scale water reservoirs. As of 2016, the initiative was benefiting 57,000 farmers (about 300000 people) in Ethiopia, Kenya, Malawi, Senegal and Zambia (WFP and OXFAM, 2016). Significant outcomes attributed to the programme include increased savings and productive assets ownership of the beneficiaries in Tigray, Ethiopia; better capacity to cope and adapt to the impact of drought following insurance pay-outs in 2012 in Ethiopia, 2016 in Ethiopia, Malawi and Senegal. These were reflected in the reduction of the stress sell of assets and consumption patterns of the beneficiaries (*Ibid*).

The Kilimo Salama is weather-indexed insurance in Kenya that provides an alternate digital approach to climate insurance. It operates on a mobile phone network for its transactions including paying for premiums and pay-outs through a well-established agricultural input stockists and distributor (Syngenta distributors). Legible farm inputs are accessed from Syngenta's dealers and if a farmer indicates interest in the insurance cover, the premium is charged to the inputs and they are sold as one package. The insurance is very flexible in that it allows its holders to insure as little as one bag of seed. The use of the mobile network ensures wider coverage as it is easily accessed by the potential beneficiaries. Secondly, it provides the insurer with a cheap distribution mechanism and hence, cheaper premiums. However, the current arrangement under this insurance leaves out the ultra-poor who cannot afford to pay for the premiums in cash.

Key Lessons

- i. High poverty levels make most insurance schemes inaccessible to the poor and marginalised in the society, yet they are one of the most effective tools for averting the possibility of the poor being pushed deeper into poverty following climate related shocks. The approach taken by R4 makes it affordable for the poor although it can

potentially marginalise the ultra-poor with no labour. On the other hand, it is more efficient and effective way by the participating governments to deal with several problems that are increasing the vulnerability of its poor populations to climate change and poverty levels through one comprehensive package.

- ii. Focusing on projects that increases resilient to climate change of the participating communities is another approach that the public works programmes could adopt from the R4 initiative.
- iii. The digital approach provides an alternate way for wider coverage at minimal costs although it increases the risk of leaving out the ultra-poor who cannot afford digital technologies such as cell phones. Countries should explore how it can be effectively utilised in enhancing adaptive capacity of the ultra-poor. One viable option is through partnerships between the insurer, telecom provider and respective governments where government is the insurance holder for instance, and using mobile network, the targeted groups gets access to the insured inputs. For example, the government of Malawi can include the insurance in its Farm Input Subsidy Programme (FISP) through partnerships with the local telecommunication provider and relevant insurance companies.

4. Conclusion and Policy Recommendations

With at least 10% of the global population living below \$1.90 a day, poverty remains one of the key development challenges globally. The majority of these people are rural dwellers who are highly dependent on rain-fed subsistence agriculture and other climate sensitive activities for the livelihoods. This makes them highly vulnerable to climate related shocks with its potential to deepen their poverty. This paper has discussed options for addressing rural vulnerability to climate change as a viable strategy to alleviate poverty. Focus was on enhancing their capacity to mitigate and/or adapt to climate related shocks by reviewing what is currently working in developing countries.

The paper notes that poverty and vulnerability are distinct though related problems to development and such, not all strategies that are directed at reducing vulnerability to climate change reduces poverty and vice-versa. However, neglecting the impact of climate variabilities and climate change related shocks on the poor and vulnerable groups, remains redundant in effective poverty reduction. In this regard, unless social protection programmes are intentionally designed to address both, they can potentially hook their beneficiaries in the poverty trap by leaving them highly vulnerable to climate change. Secondly, there is need for increased collaboration to integrate national early warning systems at the regional level to enhance their effectiveness in mitigating the potential effects of climate change. Lastly, governments should explore integrating climate insurance into their social protection programmes by partnering with the private sector to further enhance the potency of these programmes. With increased potential of savings and investments from the insurance pay-outs as in the R4 programme, insurance component in the social protection programmes will help beneficiaries to be financially capable to graduate from the programmes with minimal risk of falling back into poverty. Furthermore, running these programmes as one comprehensive package reduces operational and administrative costs and thus, allowing for inclusion of more beneficiaries.

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