Building Resilience to Climate Change: A Case Study of Female Headed Households in Arid Region of Buhera District, Zimbabwe

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Abstract Climate change is increasingly recognised as a global phenomenon with potentially far reaching implications. Sub- Saharan Africa has already started experiencing climate change. It is threatening food security with vulnerable groups who include female headed households most likely to suffer due to their heavy reliance on rain-fed systems to supplement household food security. This paper sought to explore strategies employed by female heads in building resilience to the effects of climate change. This was done by analyzing adaptation strategies employed by female heads in responding to climate change induced food insecurity as well as limitation to adaptation. An approach based on the understanding that resilience is a function of adaptation. The study is based on the action oriented theory of adaptation by Klaus I, 2011 as basis for understanding social action processes shaping climate change resilience building processes within female headed households. It makes use of the qualitative research approach through application of case study research design in which in-depth interviews, key informant interviews and focus group discussions were used to collect data. Findings from the study reflect that whilst female headed households have adopted numerous coping and adaptation mechanisms in building resilience to the threats of climate change on food security which include cultivation of traditional grains, shifting planting dates and diversifying livelihoods through participation in community savings groups and extraction of non-timber products for sale. Female heads remain constrained in their ability to adopt a wide range of local available adaptation strategies due to existing socio-cultural barriers, lack of resources and gender imbalances. Hence, the importance of designing policies, programs and implementation strategies that is gender sensitive for maximum benefit by female heads.

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X. Poshiwa and G. Ravindra Chary (eds.), *Climate Change Adaptations in Dryland Agriculture in Semi-Arid Areas*, https://doi.org/10.1007/978-981-16-7861-5_6

Keywords Adaptation · Climate change · Food security · Female headed household · Gender · Resilience

Introduction

Climate change is increasingly recognised as a global phenomenon with potentially far reaching implications (IPCC 2007, 2012, 2014). Sub-Saharan Africa has already started experiencing climate change (Holmgren and Öberg 2006). In Zimbabwe communities have already started reporting gradual changes in climatic conditions experiencing climate change marked by changes in rainfall patterns and increase in frequency of droughts (Brown et al. 2012). These gradual climate changes and extreme weather events are already undermining gains of agriculture research and development designed to secure household food security among smallholder farmers (Karfakis et al. 2012; Nelson et al. 2010). Ludi (2009) cites UNDP (2008) which notes that the impacts of climate change such as sea level rise, droughts, heat waves, floods and rainfall variation—could, by 2080, push more than 600 million people into malnutrition.

Changes in climate conditions will potentially impinge on the food security of smallholder farmers within the Sub-Saharan Africa because farming systems is heavily reliant upon rain-fed agriculture to supplement household dietary requirements (Nyantakyi-Frimpong and Bezner-Kerr 2015; Schulze 2010; Kotir 2011). Also due to the high poverty levels that typify the rural small-scale farmers their adaptive capacity remains low (Kates 2000). Among smallholder farmers, female headed households will be hardest hit as they already considered "to be the poorest" (Buvinic and Gupta 1997: p. 266) and "more food insecure" (Mallick and Rafi 2010: p. 593).

Several arguments are already being drawn as to why smallholder female heads are likely to be at danger of climate change induced food insecurities (Lambrou and Nelson 2010; Molua 2011; Twyman et al. 2014). These are centered around already existing gender related social, economic and cultural barriers such as insecure property rights, lack of or few assets, limited access to credit, extension services, weather information and an overburden of social caring roles (Alhasan et al. 2019; Tibesigwa et al. 2015; Alem et al. 2010; Hisali et al. 2011; Babugura 2010; Buvinic and Gupta 1997; Wanjiku et al. 2007). For example, in the event of a drought it has been argued that male heads of households are more likely to take up other off-farm opportunities, which may include temporary migration while women remain behind to care for the family (Kakota et al. 2011, Buvinic and Gupta 1997). This implies that their adaptive and mitigation options are lower than those of men (Bene et al. 2012; Lambrou and Piana 2006; Carr 2008; Eriksen and Silva 2009).

Zimbabwe records large proportions (40%) of female-headed households residing in rural areas (Agritex 2002) with the majority (nearly three quarters) of them living below the national poverty datum line (Horrell and Krishnan 2007). These are reported to experience challenges in financing agricultural activity, making them highly susceptible to households' food insecurity (Nyikahadzoi et al. 2012a,

b). The food insecurity situation will likely worsen in the face of climate-change (Brown et al. 2012). Despite all this, and Zimbabwe's continued exposure to climate-related shocks, there remains limited literature on social processes shaping adaptation processes and challenges encountered by female heads. Instead most studies on climate change tend to broadly cover rural livelihoods and agricultural productivity (Bhatasara 2017; Brown et al. 2012; Mutekwa 2009; Bhatasara 2015) with little attention paid to understanding dynamics shaping climate change adaptation for rural female heads. The few studies that incorporate a gender lens (Musiyiwa 2014; Gusta 2017) remain strongly inclined to rural livelihoods concepts omitting the food security discourse. This situation hinders design of policies and implementation of programs that address unique needs of the specified group.

This study draws from the social action group of theories, particularly the action-oriented theory of adaptation as propounded by Klaus and Stecker (2011) in pursuit to understand social processes shaping climate change adaptation processes and associated challenges for improved household food security for female heads. A theory that seeks to explain the relationship among variables shaping adaption to changing environments which include stimulus, the receptor, resources used to shape change process and the associated outcomes.

Materials and Methods

Study Area

The study was conducted in Buhera District, Ward 30 in Manicaland Province of Zimbabwe. The province generally houses majority female heads (41.8%) in comparison to a national average of around 35% (Zimstat 2012). Ward 30 of Buhera District falls in Agro-Ecological Natural Region V of Zimbabwe. An area that falls within arid region characterised by erratic rainfall below 450 mm per annum and occupying low land area below sea-level (500 m). It is marked by little irrigation infrastructure development and experiences recurrent crop-failure and food shortages (Oxfam-UNDP/GEF 2015). The area is suitable for extensive production and game-ranching (Anderson et al. 1993). Hence, the combination of such agro-ecological and socio-demographic characteristics provided fertile ground to how female heads in arid conditions are building resilience to the threats of climate change on household food security.

Study Approach and Design

The study adopted qualitative research approach using case study research design in which in-depth interviews, focus group discussion and key informant interview

were used as data collection methods. Purposive sampling strategies were applied throughout study processes in selection of all study participants. This was meant to ensure inclusion of persons with interests and knowledge deemed relevant to the research issues. In-depth household interviews were conducted with thirty female heads and three focus group discussions at community level. The focus group discussion comprised female heads grouped by age in the following categories 18 years to 35 years, 36 years to 59 years and the 60 years and above to capture variances in experiences for three categories namely youth, middle aged and the elderly. Each focus group discussion comprised 8 to 10 participants. Focus group discussions were meant to gain in-depth insight on experiences of female heads in coping and adapting to climate induced food insecurity. Key informant interviews were also conducted with representatives from various government departments (4 agricultural extension workers, 3 provincial and district administrative officials, 1 district environment specialist), local leadership (1 councilors, 2 village heads). Key informant interviews were meant to generate expert knowledge on how female-headed households were coping with effects of climate-change on households' food security and the challenges that they faced based on the expert's day-to-day interactions with this group including support programmes provided. All interviews were tape recorded to obtain the actual narratives from interviewees (Patton, 2002). Applied thematic analysis was used to analyse data. Specifically, data analyses process included transcription of narratives, coding of data and grouping of recurring issues into themes that guided the writing up of the findings (Guest et al. 2011). A process facilitated by application of the Statistical Package of Social Sciences Software (SPSS) in managing the data.

Ethical Considerations

Social science raises ethical issues (Creswell 2014). Schutt (2013) describe ethics as standards, principles and guidelines that have been followed when carrying out research. This study adhered to ethical standards and principles of research. The researcher took a number of steps to adhere to principle of confidentiality, informed consent, voluntary participation and giving feedback to participants after the study was concluded. The study was cleared by the Bindura University ethics clearance committee.

Results and Discussion

The findings of this qualitative study show that female heads are engaged in various climate change adaptation strategies centred on livelihoods diversification, adoption of new farming practices and increased reliance on external support in the

form of social assistance programs and remittances. Adoption of the various strategies are meant to maintain household income, improve access to credit, and sustain agricultural productivity and secure alternative food sources.

Livelihood Diversification Strategies

Livelihoods diversification emerged as part of climate change adaptation strategies employed by female heads for sustained household food security. Participants explained that most female heads were increasingly depending on forestry products, adopting small livestock and enrolling in community based savings as livelihood diversification strategies in managing and coping with persistent climate change induced household food inadequacies. These themes are discussed in more detail below.

Reliance on forestry products

The study identified increased reliance on forestry products as part of climate change adaptation strategies employed by female heads. According to key informant participants, most female heads now resort to collection of forestry fruits and wild vegetables, hunting wild birds (quail) and extraction of salt from the Save river for sell or consumption as means of managing any weather induced household food gap. The *Adansonia digitata* fruit, *Ziziphus mauritiana* fruit, *Amaranthus hybridus* leaves, *Clome gynandra* leaves and *Bidens pilosa* leaves, and quail bird form common fruits, vegetables and birds, sought after by female heads during drought. The wild vegetables of *Amaranthus hybridus*, *Clome gynandra* and *Bidens pilosa* are harvested in abundance during rainy season and preserved through natural drying processes for use later in dry months of the year; a trend that has become common post year 2000. These wild vegetables which were once consumed for their medicinal properties now provide source of vitamins in the form of relish among female heads. Female heads are finding it difficult to sustain cultivation of exotic leafy vegetables-*Brassica oeracea* (chomolia) and *Brassica napus* L. (rape) as most shallow wells used in irrigating household gardens now dry earlier. Additionally, the *Adansonia digitata* fruit, quail birds and salt are sold and or traded for grain to migrants from surrounding towns and city. Reliance on forestry products is evident from the following comments by participants:

> "For the past five years or so the rains have continued to fail us. I have had to gather the *Adansonia digitata* fruit which we sell or exchange for grain with traders from Birchenough, Murambinda, Chipinge, Mutare even Harare". (Participant 5)

Similarly another participant said:

> "Unlike other households [male-headed] who can sell their cattle and secure grain for longer periods. For most of us it's a story of making use of what is available- the quail bird, *Adansonia digitata* fruit [baobob fruit] or salt from Save river. We now use the powder from *Adansonia digitata* fruit to make porridge for the young ones". (Ward 30, FGD Female Head Participants)

One other participant said:

> "In most cases female heads have very few livestock (Maybe 5 or 6 goats). Due to persistent low rains these have also not been reproducing that much. You cannot be found always selling them as it has become a yearly problem that there are no rain and harvest are poor. You have to look for other ways to also help and for us it's the *Adansonia digitata* fruit. Harvest, sell and buy food or get grain". (Key Informant Participant 7)

From the participants comments above it is clear that female heads have adopted reliance on forestry products as means of securing income and food during drought periods. Droughts have become a common feature in the area with the coping strategy becoming a way of life for the vulnerable female heads. The finding reflects usefulness of natural resources in aiding vulnerable communities' secure alternative sources of livelihoods as threatened by climate change. However, if unregulated the practice have the potential of not only negatively affecting the ecological system of a community but also contribute to accelerated climate change.

Adoption of small livestock

From the participants narratives, it is also evident that female heads are increasing adoption of small stock particularly goats and traditional chickens as means of managing the decline in harvest due to continued low rains. Whilst traditionally such livestock has been synonymous with women, female heads described them as cheap to purchase, fast to reproduce, easy to manage and quick to sell, making them a suitable climate change adaptation strategy for female headed households whose majority live within limited resources. The following remarks bring out female heads increased adoption of small livestock as a climate adaptation strategy:

> "It has continued to be dry and we are finding it better to use income that you may have to purchase goats. They are not affected that much by drought as with the cattle. These I sell in exchange for food or money when drought hits. They have helped us a lot. The past two years I have had to sell one or two per year to secure food". (Participant 3)

Another elderly female head narrated:

> "Most of the cattles that my husband owned died as a result of these droughts. I am now left with chickens and goats. I have been selling these or exchanging them for grain for the past three years. Any money I get I make sure I buy at least 1 or 2 chickens especially the Boschveld variety. It multiplies fast, produces more eggs which has been useful in managing this new problem of hunger. Chickens and goats do not require additional labour. I can always manage on my own. I just make let them out and as I do other chores they are browsing or looking for food in nearby surrounding". (Female Head Respondent 7)

An agricultural extension worker had this to say *"We are encouraging households to adopt small livestock particularly goats and traditional chickens as these are more drought tolerant in comparison to cattle. They are also easy to manage and are quick to dispose. Most female heads have taken heed of this call and whenever they secure some small funds are now resorting to investing in goats and traditional chickens. Whilst it has been difficult for household to find extra income to buy such livestock as they continue failing to make much due to low yields. Participating in community based savings groups has helped in providing access to income for purchasing small livestock. Additionally some NGOs continue to come with some pass small livestock*

projects targeted at female heads. This has improved their situation" (Key Informant Respondent 2).

The above narrative of female headed households and key informants present the notion that small livestock have become a more attractive adaptation choice among female heads whose majority have limited income and labour resource. This can act as both a source of protein and means of cushioning households in dealing with household food deficit needs especially during severe drought periods as they can be exchanged for grain or sold for such purposes.

Enrolment in community based savings groups

Enrolling in community based savings and commodity groups emerged as one other climate change adaptation strategy common among female heads. The strategy provides female heads opportunities to save and have access to credit useful in managing household emergencies such as food shortages as opposed to local loan sharks who usually charge higher interest rates. Additionally money borrowed has been useful in providing start-up capital for income generating projects contributing to establishment of diversified livelihoods among households. They also noted ability of commodity groups to act as food reserve which they always find useful in covering any food needs as a result of weather related crop failure. Enrolment in community based savings groups as climate change adaptation strategy in arid regions by female heads is evident through the following narrations by respondents:

> "I joined the community savings groups and the profits are used to purchase household food items such as cooking oil, sugar and rice. A hamper is given out to every member at the end of year. Depending on amounts one can receive upto 20kgs of rice. This has been useful in covering for the poor harvests. Thus I always make sure to look for the $1 monthly subscription fee so I know I am guaranteed of something to feed my family in the next year even though there is a drought". (Female Head Respondent, 15)

Another female head respondent narrated:

> "The continued drought years have made it difficult for us as female heads to raise money for inputs for the next season. Being a member of the internal savings and lending club has at least guaranteed my household seed and fertiliser which I can use in the fields. This year is a bad year and I am planning to borrow some money to start some Boschveld chicken raring project". (Female Head Respondent, 27)

One other respondent had this to say: "*At times as female heads you have no one to quickly come in and rescue you following a drought. By joining the savings groups I know I can easily get a loan to buy food while I wait to sell that chicken or receive some remittances. As rains continue to be erratic, you need to be part of such groups. The monthly subscriptions are manageable especially for most of us who always find it difficult to raise large sums of money"* (Female Head Respondent, 10).

The above narrations thus confirm participation in community based savings groups as one other resilience strategy adopted by female heads. The findings confirm finding by Alhassan (2019) where female heads in Ghana were reported depending on savings to borrow money to cover food needs in times of drought. Members can also make use of loans secured from savings groups to finance a household project thereby

promoting livelihood diversification a recommend approach to building resilience. For example in one similar study in Zimbabwe women tended to invest proceeds earned from communal savings groups to finance a new non-farm small business venture as means of building resilience against any future household shock including drought and floods (Gash et al. 2020).

Adoption of New Farming Practices

Adoption of new farming practices also emerged as part of the climate change strategies adopted by female heads in dealing with sustaining agricultural productivity so as to maintain household food security. This includes shifting planting dates, reducing land area cultivated and adoption of drought tolerant crops which are influenced by continued increase in dry spell, reduced amounts of rainfall, disappearance of winter rains which mark land preparation time, delayed onset of first rains and shortened agricultural rainfall season.

Shifting planting dates

Female headed households reported shifting planting dates from the traditional mid-November to mid-December to match changes in onset of first rains. The disappearance of winter rains have also made it difficult for the majority of female heads who depend on manual labor to prepare land before the first rains. Most female heads also solely depend on rain-fed system promoting the need to alter farming practices in accordance with changes in rainfall patterns. The following are a sample of participants' utterances pertaining shifting of planting date:

> "The rainfall trend for the past 10 years or so has been coming in first week of December. In the 1990s by mid-November you would expect the first rains. For most of the female heads that depend on rain-fed agriculture we have had to adjust accordingly. We now plant in December and this can be upto mid-December". (Female Head Respondent, 4)

> "Initially I continued dry planting in the last week of October or First week of November expecting rains to fall immediately. I realized I was now missing it as the rains would come in December and may start of in the low range. So crops that would have been dry planted do not germinate. Instead the seed would rot and forcing you to buy again or look for someone to give you. So I now plant when I see there has been enough rains to allow germination, which is anytime from mid-December. That way you are assured of some harvest". (Female Head Participant, 20)

> "Traditional leaders and lead farmers now encourage us to plant late. That is what we have adopted. Previously it was November/October now it's in Dec". (Female Head Participant, 1)

From the participants' narratives above, it is clear shifting planting dates is a common strategy that female heads are adopting in response to changing climatic patterns such as delays in onset of first rains. The strategy depicts application of incremental approaches to climate change adaptation processes as identified by Kates et al. (2012). An approach characterized by adoption of minor and small scale adjustments

by communities to tradition social and ecological systems with a focus on building resilience to climate change impacts. Additionally, the finding reflects the value of tradition leaders and extension staff as agents of resilience building process.

Reducing land area cultivated

Reducing land area cultivated came out as one other strategy that most female heads have adopted. Female heads narrated that whilst other communal member has access to irrigation plots in government irrigation schemes. Most of female heads lost such plots upon death of spouse or did not get first preference during allocation as they were considered able to migrate upon marrying or remarrying. Those with irrigation plots whilst they have adopted reduction of land area cultivated they have maintained better leverage in terms of land size area cultivated. Hence, whilst, this has been the most notable option to match changing rainfall patterns it has come with some disadvantages as the option has failed to guarantee improved yields. The following provided narratives from key informants as well as female head participants:

> "Rain now comes late in December and by January they are gone and then again during March for a very short period. I have had to reduce the area that I cultivate for crop production by more than half. When the rains eventually fall there is very little time to prepare and plants. While this helps me at least secure some harvest things could be better if I had a plot in the irrigation facility which could continue to provide water for my crop during dry spell. Those in the irrigation scheme usually perform better". (Female Head Participant, 3)

Another respondent had this to say: "*For most female heads it has become challenging. I have no draught power and when the rains come late in the season I just manage with what I have. So with my two children in primary school we know we can only cover a small area"* (Female Head Participant, 7).

Another key respondent had this to say: "*Rains have become more and more erratic. They also come late in the season. Hence most households with limited labour particularly elderly and young female heads have been forced to reduce the size of plots they cultivate. In some cases it has yielded favourable results. If many of them had some plot in the irrigation facility reducing land area cultivated could have more sustained benefits as some harvest could be guaranteed from the non-rain fed plot. But as it is at there are no guarantees. In severe dry years no harvest may be realised."* (Key Informant 4).

It is clear that female heads make use of reducing land area cultivated as one of the coping strategies in managing delays in onset of first rains and shortening of the rain season which has been negatively affecting yields. These findings affirm previous studies in Ghana, Ethiopia and Cameroon which also identified reducing land area cultivated as common climate change adaptation strategy among peasant communities (Alhasan et al. 2019; Gebrehiwot et al. 2013; Deressa et al. 2009). A coping strategy common among communities is lacking technical and financial capacity to respond in different ways.

However, as depicted in the above narrations, reducing land area cultivated is proving useful among female heads, it bears some limitations as it remains a rain fed approach to farming which provides no guarantees to securing harvest. Access to

irrigation plots would bring more sustained benefits yet these remain limited due to traditional customs around allocation of land in the area which do not favour women. Such systemic constraints around traditional land tenure and user rights are posing as limitations to female heads ability to acquiring sustainable resilience capacities. An important area to consider in climate change policy is review and programing especially for the food security sector.

Increased cultivation of drought tolerant crops

Findings form the study also point to increased adoption of drought tolerant crops among female heads in managing changing climatic conditions for improved food security. There is an acknowledgement that the area is arid and has always been suited for drought tolerant crops. Female heads note abandoning common practice of cultivating beans and maize in garden plots which they would irrigate using shallow wells and resorting to cultivation of small grains-*Panicum miliaceum*, *Eleusine coracana* and legumes-*Vigna unguiculata*, *Arachis hypogea* and *Vigna subterranea* which are drought tolerant. These findings are made explicit by the following narration as explained by participants:

> "In the early 2000s I would also grow maize and beans on the garden plot. I used to make use of the shallow well in the garden to irrigate the crops. I no longer cultivate such crops as the shallow well I use to water the crops now dries early since each year we are receiving low rainfall. I now concentrate on growing *Vigna unguiculata*, *Arachis hypogea* and *Panicum miliaceum*. At least you are guaranteed of some harvest". (Female head participant, 22)

> "These years I now plant *Eleusine coracana* for grain and *Vigna unguiculata*, *Arachis hypogea* for legumes. With these ones you do not get disappointments. With *Vigna unguiculata*, I also dry the leaves for use as relish later in the year. With continued low rains and shortening of the season I now prefer these". (Female Head Participant, 3)

> "If you are fortunate you may secure contract farming with some private companies to cultivate small grains such as the *Panicum miliaceum* variety which they in turn use to brew beer. Hence, I choose adopting small grains". (Female Head Participant, 26)

Key Informant Respondent

> "Most female heads like any other member of the community are finding it beneficial to stick to drought tolerant crops. Apart from their drought tolerance qualities they offer room to use of retained seed which can also be a product of pass on with one guaranteed of a harvest. They also do not require much fertiliser. Even where there is no or little feeding one can secure some harvest". (Key Informant Participant, 11)

The above participant narrations point to adoption increased cultivation of small grains and drought resistant legumes as common among female heads. The adoption of drought tolerant crops among communal farmers as a climate change strategy has been affirmed by other studies (Fagariba et al. 2018; Alhasan et al. 2019) These small grains (*Panicum miliaceum*, *Eleusine coracana*) and legumes (*Vigna unguiculata*, *Arachis hypogea* and *Vigna subterranea*) which are drought tolerant have several benefits for female heads. Firstly, by ensuring continued availability of carbohydrates and protein content in female headed households. Secondly, as depicted from the narratives, production costs are lower as even were retained seed has been used and no fertiliser applied there is guarantee of some harvest. This makes them best

suited for female heads who usually find it difficult to finance agricultural activities. Thirdly, the possibilities of securing contract farming opportunities also offers added advantage of providing sustainable livelihood opportunities for vulnerable households. This not only aids in incremental approaches but enhances female heads transformation capacities in resilience building. As the opportunity bear potential to addressing systemic barriers in financing the adoption of strategies through forming of partnerships with the private sector.

Reliance on External Support

Interviews with female heads participants, local leadership other stakeholders from various government department, the private sector and non-governmental organisations pointed to reliance on external support in the form of food aid, cash transfers, food for work, food for assets, seed packs and remittances as one other strategy adopted by female head. The narratives below provide evidence on this strategy.

> "Most elderly female headed households are continuing to find it difficult to cope with changing climatic conditions. The shift in dates of onset of first rains, the shortening of the season is something making it difficult guarantee enough harvest to feed the family. Some of the new farming techniques such as conservation agriculture are proving labour intensive for female heads with no additional labour. So they wait for NGO or government food assistance programs to feed their families". [Extension Officer Key Informant Participant, 2]

> "It has been difficult for me as an elderly person. I tried farming using conservation farming method. I could not bear it. It left me with terrible back aches. So I now wait for government food assistance program. My brother here and there also sends some money to buy grain". [Female Head Participant, 20]

> "Most drought years I have had to be on school feeding program. So I can have one meal per day but the children are guaranteed of a second one from school". [Female Head Participant, 14]

> "Most of us have now been participating in drought relief programs". [Female Head Focus Group Participant 1]

It is clear from the above narrations that reliance on external support forms one of the strategies to managing climate change common among female heads. For the Buhera community, this takes the form of NGO support and remittances from kinship members. A finding that affirms previous studies (Tibisegwa et al. 2015). This approach takes the form of a coping strategy. It reflects the value and importance of social capital (internal and external) in managing climate change related household food gaps. However, the strategy also reflects confinement of female heads to use of the local structures and systems in adapting to climate change which in most cases may fail to build on adaptive capacities of such vulnerable households. A different approach for men is at liberty to migrate and explore other opportunities which may have higher returns.

Additionally, the findings reflect the need to invest in technically appropriate climate smart technology that match various socio-demographic characteristics of

different categories of people in society i.e. female headed characterised by labour constraints and the elderly who can no longer meaningfully engage in livelihood activities.

Conclusion

It can be drawn that female heads are adopting several strategies in building resilience to climate change. These include livelihoods diversification, changing farming practices and depending on external support. The strategies take the form of coping and incremental approaches and are proving useful in strengthening the households' absorptive and adaptive resilience capacities. The strategies focus on sustaining agricultural productivity, maintaining household income, improving access to credit and securing alternative food sources. For female heads such resilience building strategies remain localized and based on traditional practices of sustaining livelihoods. Kinship ties and community stakeholder support plays a significant role in facilitating the resilience building process. However, this offers opportunities for layering of sustainable development programs including enforcement of regulations to control practices with potential of environment degradation. The poor socio-economic resource base characterizing female heads compromise their ability to adapt. Additionally gender norms and traditional customs i.e. on land tenure presents systemic constraints to climate change adaptation process within female heads. Hence this paper recommends application of pro-active approaches in the design of climate change policies and programs that are gender sensitive and seek to address any existing socio-economic and cultural barriers for the creation of resilient communities.

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