

## **Climate Change, Economic crisis and their implications for a Gendered Livestock-Water Productivity, reflections from Ethiopia and Zimbabwe**

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Proposed Panel: Panel 12 Achieving Climate-resilient Agriculture and Food Systems in Turbulent Times

The world's poor must not pay the price for the collapse of financial markets. Without immediate action, millions will suffer (Oxfam 2009).

### **Abstract**

Climate Change and the global economic crisis are negatively impacting on the resilience of agriculture and rural development in countries such as Ethiopia and Zimbabwe. Livestock Water Productivity (LWP) is becoming a major area of research which aims at increasing agricultural productivity through the use of less water for both livestock and crops as an adaptation and mitigation strategy to Climate Change. Via BMZ funded research, IWMI and ILRI are attempting to understand the gender implications of different interventions to increase livestock water productivity. This paper draws on research conducted in Ethiopia and Zimbabwe and also the wealth of information emerging from the Multiple Use Systems Project. Some of the emerging results show that technological innovations are not gender neutral, as their design, timing and labor requirements have differential gender implications. Some technological interventions to increase livestock water productivity might result in more work for poor women and men with little benefits going to them. Secondly, gender and power relationships also shape the benefit terrain which results in differential access and control of the benefits from the improved livestock water productivity. Thirdly, what matters is not just improving livestock water productivity, but the type of livestock targeted. Small livestock development interventions are likely to contribute towards improvements in the livelihoods of both poor women and men. This paper concludes that responses to Climate Change and the current Global Economic Crisis should not only focus, broadly, on the resilience of agriculture in developing countries, but it should also take into account the differential impacts that climate and global economic crisis responses have on gender.

### **1. Introduction**

There is now a general consensus amongst the epistemic community that Climate Change is taking place at a global level (IPCC 2007). The year 2008 has also seen the Global Economic Crisis which has severely affected the Developed countries with the United States sub-prime mortgages being a major contributor to the recession. The impact of the

global recession has not been immediately felt in developing countries. Most economists predict a delayed and prolonged impact on the developing world which are least prepared to cope with the dual impacts of Climate Change and the Global Economic Crisis (Oxfam 2009). The developing countries will be affected through reduced remittances, reduced bilateral and multilateral support from the Developed countries and reduced trade opportunities as the Developed economies shrink. The adaptation and mitigation costs will be beyond the capacity of most of the developing countries. The UNFCCC defines adaptation as ‘adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.ø Mitigation is defined as ña human intervention to reduce the sources or enhance the sinks of greenhouse gases. Examples include using fossil fuels more efficiently for industrial processes or electricity generation, switching to solar energy or wind power, improving the insulation of buildings, and expanding forests and other "sinks" to remove greater amounts of carbon dioxide from the atmosphereø (UNFCCC 2009) . This paper will draw the potential implications of these developments on gendered livestock water productivity drawing upon the Ethiopian and Zimbabwean case studies.

According to the World Development Report (2008) sub-Saharan Africa has potential to develop its agriculture (WorldBank 2008.). However, according to the IPCC Synthesis Report (2007) by 2020 between 75 and 250 million people in Africa are projected to be exposed to water shortage due to Climate Change. Yields from rain fed agriculture are expected to decline by 50% by 2020 in some African countries. Although different models can not agree on the exact magnitude of the impact of Climate Change in Africa, there is consensus amongst the 19 models that Africa will be adversely affected. Projections to 2050 show Southern Africa getting less rainfall, East Africa will get a slight increase in rainfall with West Africa rainfall remaining the same (Giannini 2008). The major impact of Climate Change will be to increase the frequency of climatic shocks such as floods and drought (Shewmake 2008; AfrolNews 2009; Christoplos 2009). Some studies have even linked the late twentieth century Sahel droughts to the impact of the global tropical oceans rather than local resource management (Giannini 2008). Food security is therefore expected to worsen making malnutrition a major concern. The cost of mitigation and adaptation to Climate Change in Africa is estimated to be between 5 to 10 % of the entire continentø Gross Domestic Product. The International Institute for Environment and Development (IIED 2008) argues that Africa is poorly equipped to adapt. The United Nations Framework Convention on Climate Change (UNFCCC) helped establish Special Climate Change Fund, the Least Developed Countries Fund and the Adaptation Fund to help poor countries such as in Africa respond to the threat of Climate Change.

I would think it might be good explaining in the introduction why improving LWP is a way to cope with the problems associated with climate change and the economic crisis.

## **2. Brief Overview of Case Study Countries**

### **2.1. Ethiopia**

The Ethiopian Prime Minister is quoted as having said ‘The Agricultural sector remains our Achilles heel and source of vulnerability’. Nonetheless, we remain convinced that agricultural-based development remains the only source of hope for Ethiopia. Prime Minister of Ethiopia, Meles Zenawi in 2000 by the Futures Brief ([www.future-agricultures.org](http://www.future-agricultures.org)).

Ethiopia is one of the few African countries which was not colonised except for the brief occupation by the Italians from 1936 - 1941. Ethiopia is located in East Africa with a total population of 77 million people with 90% of its population being largely dependent on rain fed agriculture (MoFED 2006). Tentative downscaled Global Climatic Models (GCM) and the IPCC models seem to show that Ethiopia is one of the countries which will have a slight increase in its rainfall by 2050 (WWF 2006; IPCC 2007). The increased rainfall will be skewedly distributed making it less reliable for rain fed agricultural production. Currently, 3% of Ethiopia’s agricultural land is irrigated (WorldBank 2007; WRI 2007). Agriculture accounts for nearly half of its GDP, 85% of foreign currency earnings, and 80% of total employment (Temesgen *et al.* 2008). According to the United Nations World Water Development Report, ‘there is clear evidence of a relationship between climate variability and economic performance in countries in which agriculture has a large share of GDP such as Ethiopia (UNESCO 2009).

Ethiopia has seen some of the worst famines in Africa. In 1984/85 an estimated one million people died due to drought and famine (BBC 2009). A decade earlier, in the 1972/1973 period several people also died due to famine and this also partially contributed to the fall of the Emperor Haile Selassie in 1975. The more recent drought was in the 2002/2003 period. In 2006 floods caused substantial human and property loss in Ethiopia (Tadege 2007). In non drought years about 7.2 million people depend on food aid making it one of the biggest food assistance programmes in Africa (DFID 2007). Ethiopia is ranked 169<sup>th</sup> out of 177 countries in terms of the World Bank’s Human Development Index Rank with a Gross National Income per capita of USD220 per annum (UNDP 2008). The Ethiopian 5 year Development Plan called the Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) makes poverty reduction one of its main objectives (MoFED 2006).

## **2.2. Zimbabwe**

Zimbabwe became independent from Britain in 1980 after an anti-colonial struggle spanning more than two decades. Land ownership was a key motivation in the struggle for independence. The early 1980s were characterised by economic growth and the delivery of social services and infrastructure to the previously disadvantaged sectors of society (Hammar 2003). Significantly, many farmers from communal land<sup>1</sup> seized these opportunities and shifted from subsistence to commercial production in what has been dubbed Zimbabwe’s agricultural revolution (Rukuni 2005). By the late 1980s economic growth faltered largely due to the over-regulation and price controls inherited and maintained from the previous regime (Bond 2002). An Economic Structural Adjustment Programme (ESAP) supported by the World Bank and International Monetary Fund

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<sup>1</sup> Communal areas are where most black Zimbabweans live.

(IMF) aimed to liberalise the economy and bolster economic growth. ESAP had many positive impacts across the economy; however, these were mostly confined to the private sector middle and upper income earners. A critical weakness of ESAP was the failure to provide safety nets to cushion those who lost out (Raftopoulos 2001).

ESAP triggered a number of processes in the mid to late 1990s. These included a trend towards increased corruption, a decline in economic growth and an increase in the rate of inflation. Economic liberalisation which resulted in the decline in employment opportunities whilst opening up the media, also resulted in greater political aspirations and the Zimbabwe African National Union-Patriotic Front (ZANU-PF) government was defeated in its aim of establishing a one-party state. This gradually led to the emergence of the first credible opposition to the ruling ZANU-PF party.

In 2000, the government lost the February referendum for a new national constitution, representing the first defeat of the ruling ZANU-PF party in 20 years. The opposition Movement for Democratic Change (MDC) and the National Constitutional Assembly (NCA) had campaigned against the government's proposed constitution, which made provisions for large scale appropriation of white-owned farmland. Immediately, the government backed invasions of commercial farms as an alternative approach to redressing the land issue, as retribution against those who were perceived to have supported the opposition and to divert attention away from the declining economic situation. The farm invasions significantly cut agricultural output and exports, worsening the fiscal pressures on the government. Importantly, they also resulted in the loss of foreign capital, skills and decline in new foreign investment. The World Bank and the IMF withdrew their support to the government. The cumulative effect was that Zimbabwe entered a period of sustained hyper-inflation and economic contraction (Bond 2002).<sup>2</sup>

Zimbabwe used to be food secure in the early 1980s. Currently nearly half of its population are dependent on food aid. The IPCC models show that Climate Change in Zimbabwe will largely result in less rainfall being received, as is the case in the broader Southern African region. The decline is attributed to Climate Change and the El Nino effect (Mason 2001; Giannini 2008). This will further be exacerbated by the erratic distribution of the reduced rainfall which will largely affect the small holder farmers, comprising 60% of the population, and being dependent on agriculture (Nhemachena 2008).

### **3. The role of gender in Livestock Water Productivity**

Gender is a central organizing principle of societies and often governs the processes of production and reproduction, consumption and distribution. Gender roles are the "social definition" of women and men, and vary among different societies and cultures, classes and ages, and during different periods in history. Gender-specific roles and

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<sup>2</sup> As of 16 July 2008, the Zimbabwean dollar was worth 600 billion dollars against 1 United States Dollar (US\$). Inflation was 2, 2 million percent in June 2008 (Source: The Mail and Guardian [www.mg.co.ac.za](http://www.mg.co.ac.za) accessed on 16 July 2008). From February 2009 Zimbabwe has abandoned its local currency and is now using the United States Dollar and the South African Rand.

responsibilities are often conditioned by household structure, access to resources, political stability and ecological conditions. Gender research in rural development is therefore essential in poverty reduction and sustainability of development interventions (van Hove undated). Since Climate Change will further worsen the resilience of agricultural systems in Africa, it is therefore important to look at such impacts through a gendered lens.

Within sub-Saharan Africa, livestock are perceived as playing a major role in poverty alleviation (Peden et al. 2007) and environmental services. Livestock Water Productivity (LWP) is part of overall productivity of water for food production and is defined here as the scale dependent efficiency of direct and indirect use of water for provision of livestock products and services. It includes water depleted for the production of livestock products and services and takes into account the impact of livestock on water quality, availability and value to subsequent users (Peden 2007). However, it needs to be viewed using a gendered lens that will enable an assessment of the differential impact of the proposed interventions on both poor women and men. Rural development in sub-Saharan Africa has attempted to improve the livelihoods of the poor people but has resulted in the entrenchment of central power (Ferguson 1994) or has not taken into account the gendered dimension of poverty. It has often only improved the well being of well-off male-headed households, leaving poor females, children and poor males worse off (Van Hove 2006).

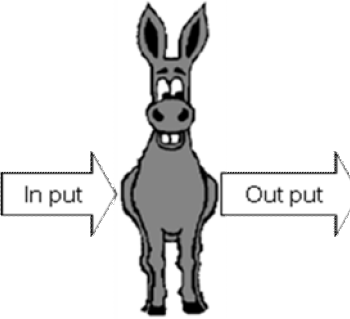
#### **4. Gendered Climatic Change Implications for Livestock Water Productivity in Ethiopia and Zimbabwe**

##### ***4.1. Conceptual Framework: A Gendered Sustainable Livelihood Framework (GSLF)***

This research draws upon the Gendered Sustainable Livelihood Framework (GSLF) which was developed by van Hove and van Koppen (2006). Figure 1 below shows the GSLF. This framework largely borrows from the Department for International Development (DFID) framework on sustainable livelihoods (DFID 1999), which merges together the DFID's SLF with the gendered framework which was developed by Feldstein and Poats (1989).

Figure 1: The Gendered Sustainable Livelihood Framework (van Hoeve and van Koppen 2006)

Livelihood Assets (Five Assets)	Costs to access assets	Access/Control					Livestock as an Asset  Keeping Livestock as a Strategy/activity	Benefits /Outputs or Outcomes/	Access/Control					Risks/Vulnerability Contexts =shocks, trends, seasonality/	Institutional Contexts		
		M	W	H	C	G			M	W	H	C	G		Local / Community	Government or Private	
<b>Natural</b> - Water - Land - Feed							<b>Water? Feed? Land?</b> ■ Where? ■ How much? ■ What is the cost? (Time, labor, price?) ■ Which mechanism helps to optimize water use?	-Soil fertility									
<b>Human</b> - Labor - Knowledge - Skills - Health								-meat -milk -manure									
<b>Physical</b> - Water								-Traction -Transport -Energy									

Infrastructure - Services								/Fuel/						
<b>Financial</b> - Cash to purchase or pay for Goods and Services - Wealth?								-Income -Insurance -Coping -startegy						
<b>Social</b> - Resource sharing groups - Gifts, Bride Price - Cultural Festivals								-Status -Social Security						

**Key:** M = Men; W = Women; H = House hold; C = Community, G= Government  
: The last two columns - Vulnerability and Institutional - help to show the different constraints and opportunities of livestock keeping in the context of other productive and non productive activities in the system.



In the first column, there are the five livelihoods assets: natural, human, physical, financial and social. Examples of each of the assets are listed under the respective asset type. The second column looks at the costs to access the assets. This is further disaggregated by gender to demonstrate the costs of different interventions within the household and in the community at large.

#### **4.2. Gendered labor contribution**

This research project attempted to analyze not only the overall labor requirements of new interventions, but disaggregated along gender lines. Intensifying crop livestock systems may influence power balances and gender relationships. For instance, if a new cut and carry scheme is introduced, depending on the specific circumstances, it might result in increased labor requirements for women through collecting fodder for the livestock. If cattle herding was previously the responsibility of boys and men, the result is an increased workload for the women (cf. van Hove and van Koppen, 2006). Climate Change is also likely to result in increased labour requirements for women in order to respond to the increasing risk of crop and livestock loss. Such extra labor requirements have also to be further juxtaposed on the different types of households. *De jure* female headed households tend to have labor constraints for their agricultural activities when compared with *de facto* female headed households where the male heads of household are based in urban areas and tend to send remittances which can then be used to hire extra labor. Male headed households tend to have more labor reserve than the two types of female headed households (cf. ICRISAT 2007 (Van Hove 2006; ICRISAT 2007)). It is however, important that the intra-household assessments also look at the impact of gendered labor contribution in male headed households. studies have demonstrated that in some irrigated areas in the Awash River Basin of Ethiopia women in male headed households were worse off than women who headed their own households and had access to irrigation plots (Aredo 2006). The Access/Control column shown above identifies who has access and control of the input attribute. Quality of labor available is also an important issue especially in countries such as Zimbabwe that have been negatively affected by HIV and AIDS. The result is a dominance of elderly and widows in rural areas. The available quality of labor is already overstretched due to caring for the sick, especially in the Southern Africa region, where the sick tend to move to rural areas when they are too weak to continue working (Mapedza 2008). Beyond labor, other gendered livelihood assets like knowledge, skills and transport are also important.

#### **4.3. Gendered control of and access to benefits from livestock**

The right side of Figure 1 looks at outputs, or the benefits coming from improved Livestock Water Productivity. The benefits include income, insurance and draught power (depending on the type of livestock). The next column ó Access/Control - looks at who benefits from increased income. How does one also access increased income? Often women and children are contributing most of the labor requirements, but the income distribution does not reflect that contribution. Studies by ICRISAT (ICRISAT 2007) have demonstrated that women tend to have access to and control of benefits derived from

small livestock (cf. Van Koppen et al 2005). Aredo *et al* (undated) further point out that marketing for large livestock such as cattle is tilted in favor of males rather than females. In such circumstances, promotion of small livestock such as goats and chicken might help reduce poverty amongst the women. Oxen through the provision of draft power also positively contribute to the reduction of women labour farming using hoes. The ICRISAT study also found out that income controlled by women was also significantly contributing towards schooling of the children. For example, benefits such as increased milk production may not benefit women and children because the males sell the milk to buy alcohol. Children and women are worse off when their labor requirements increase without any benefits accruing to them.

The access and control of benefits terrain is also shaped by the political, economic and institutional contexts. Laws and rules on livestock and land tenure will directly and indirectly impinge on who has access and who benefits from the improved livestock water productivity. Institutions - from local to community level - and how they are nested to national level, also has an important implication in access and control of benefits by both women and men.

#### ***4.4. Innovations to improve livestock water productivity and their impact on social relationships***

Not all innovations towards improving livestock water productivity negatively affect women. If there are better forages which will result in less time spent on harvesting and collecting forages this will be beneficial to the women. If clean water is made available through multiple use systems which include livestock and domestic requirements, this will save time previously spent collecting water for both domestic, livestock and other uses (cf. van Koppen et al 2005). This frees the women to carry out other duties such as spending more quality time with their children and family. For the children, this might also entail more time available to play and to do their homework. Improved milk production as a result of improved fodder quality might benefit the family through improved nutrition for the family.

In Lege Dini watershed in Eastern Ethiopia, livestock productivity increased with improved water supply services. Milking livestock is a responsibility of women and the ability to have fewer animals that yielded more milk provided women with higher incomes from reduced labour (Van Hove 2004). This was one of the very few sources of cash income for women in this area. They organized themselves into a milk cooperative, where they would daily gather any surplus milk (left over after home consumption) and mix it, regardless of animal types. This milk is marketed to the nearest town, almost an hour drive, and group members rotate who goes to the market and keeps the revenue (Van Hove 2004). The women used this additional income for improved hygiene at household level and for school costs (Jeths 2006).

If women derive benefits and financial independence as a result of improved livestock water productivity, this might result in the empowerment of women beyond crop and livestock issues. Such empowerment might result in women re-negotiating their position

and status in the household. Such household re-configuration will, in a small way, contribute to the increased esteem of poor women and men in sub-Saharan Africa.

## **5.0. Case Studies from Ethiopia and Zimbabwe**

As part of the BMZ and Challenge Program on Water and Food Project 37, a survey of key informants on the relative contribution and benefits accruing to men and women in livestock and related farming activities was undertaken. The results presented below are based on the experts' perception of access, control and benefit distribution in the three case study sites of Ethiopia and Zimbabwe.

### ***5.1. Livestock Resources: Access and Control***

For the livestock resources such as cattle, the perceived access was more for men than women with the exception of Ethiopia where it was perceived as 50% for access and 50% for the benefits. However, if you discuss further and look at oxen which are used for draught power, the discrepancies between men and women were more pronounced. In Zimbabwe men had more perceived access to cattle (60%) and the related benefits (80%). In Ethiopia women had 50% of access to oxen but only derived 20% of the benefits from oxen. The general trend in the two case study countries was that women had more access and control of benefits from smaller livestock such as poultry. However, in Ethiopia for instance, the importance of milk from cows was seen as an important benefit for the women in terms of both nutritional values and cash income. In some areas of Ethiopia, it was a taboo for a household to sell milk from domestic livestock.

Figure 2: Perceived Gendered Access, Control and Benefit from Livestock related activities

<b>COUNTRY: Ethiopia and Zimbabwe</b>			<b>SITE OR PRODUCTION SYSTEM: Crop livestock system</b>				
Researchers' perception of Gender (women and men) resource profiles, indicated in percentages of total access and control (Percy, 1997) <i>Perceived access to...</i>			<i>Perceived control over...</i>			<b>COMMENTS</b>	
<i>Resources</i>	Husband	Wife	Husband	Wife	<b>Benefits</b>		
<b>Livestock:</b>							
<b>Cattle</b>	Ethiopia	50	50	50	50	Meat, cash income, milk, butter, hides, manure	Sale of cattle, feeding and watering in the field, hide processing is done by men while milking, butter sale and manure processing is women's responsibility
	Zimbabwe	60	40	80	20		
<b>Sheep</b>	Ethiopia	70	30	80	20	Meat, cash income, skin, manure	Men control sales income. Feeding, manure collection is done by women
	Zimbabwe	60	40	65	35		
<b>Goats</b>	Ethiopia	70	30	80	20	Meat, cash income, skin, manure	Men Control sales income. Feeding, manure collection is done by women
	Zimbabwe	40	60	65	35		
<b>Poultry</b>	Ethiopia	20	80	20	80	Meat, eggs, income	Women are the main actors
	Zimbabwe	20	80	10	90	Meat, eggs, income	Women are the main actors



## 6.0. Recommendations and Conclusion

This paper and associated research emphasize the following recommendations:

- Gender matters in livestock water productivity and has to be seriously evaluated. This should be understood in the broader context of Climate Change which might further limit the gendered access to livestock.
- Development initiatives should avoid using labor contribution as an indicator of empowerment and participation. It is important to note what women are getting related to their contribution. Special attention should be given to the labor contribution by children and what the consequences are of increased or reduced work loads, e.g. enrollment in schools.
- Preconceptions about the wellbeing of married and female headed women should be assessed for each context. In Ethiopia's Awash River Basin, female headed households were observed to be well off as they had access to irrigation land. If irrigation efforts to reduce the risk of Climate Change are used as a strategy for both Ethiopia and Zimbabwe, there is a need to include female headed household as well.
- Impact of HIV and AIDS has to be considered in view of the labor and time requirements of the different types of interventions in the context of Climate Change.
- Access and control of benefits has to be assessed. This has to be linked to the inter- and intra-household power dynamics and institutions which help alter and shape the structure of incentives and determine who has access and control. Impact of the Global Economic crisis and the Climate Change impacts have to be factored in a gender sensitive manner.

Whilst it is important to note that improving LWP is central to improving the livelihoods of communities in Ethiopia and Zimbabwe, it is equally important to further evaluate what such improvements imply for different members within the household. Technological innovations are not gender neutral but their design, timing and labor requirements will have differential gender implications for poor women, men and children. If the household benefits, it does not mean that the welfare of all household members are improved. A gendered livelihoods approach enables a critical assessment of the winners and losers both at the intra and inter-household levels. Such an approach is very informative and will help identify gender sensitive livestock interventions. Development is meant to reduce poverty for the most vulnerable. The LWP research being carried out under the auspices of the BMZ Project and building upon the earlier CP Research, hopes to contribute towards meeting such objectives with lessons distilled from the sub-Saharan Africa region being relevant in the context of the current Global Financial crisis and Climate Change.

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