A Gender Perspective on Treadle Pump Profit Making

A case study of treadle pump irrigation in IDE's project areas Kafue and Kabwe, Zambia

M.Sc. Thesis by Famke Ingen-Housz

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Master thesis Irrigation and Water Engineering submitted in partial fulfillment of the degree of Master of Science in International Land and Water Management at Wageningen University, the Netherlands

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Abstract

The treadle pump is designed as a tool to make small-scale irrigation accessible to poor rural households. A treadle pump is a simple, human powered device and can be manufactured and maintained at relatively low cost. In Zambia, where land is abundant and enough water is stored in shallow aquifers, the treadle pump seems to be a solution to provide poor farmers a more easy access to irrigation water and thereby improving the productivity and the livelihoods of smallholders. In Zambia, IDE is one of the development aid organizations promoting treadle pumps. In 2006 IDE started its project Rural Prosperity Initiative. Within this project, IDE tries to strengthen the linkages between irrigation development and poverty alleviation by helping smallholders becoming more effective market participants. Aim of the project is to increase the net annual income of 6000 rural smallholder families by at least $ 200 and to increase the net annual income of another 8000 rural smallholder families by $ 100. IDE beliefs the adoption of a treadle pump benefits all members of a household. However, considering gender, the introduction of new technologies may have differential impacts on the well-being of men and women. IDE was during my period of field research in Zambia seeking for ways to address gender issues in its RPI program. This research was conducted to find out which gender ideas of IDE Zambia inform its RPI project and their approaches for introducing treadle pumps in Zambian rural smallholder households. In addition, this study analyses how IDE's ideas fit in the bigger context of gender and development. One of the more prominent findings of the study is that IDE's view of a rural household and their market-based approach consolidate the existing gender roles in rural households and communities. IDE does not consider gender as an important structuring variable in transforming the RPI inputs into outputs and benefits and therefore seems not to reflect on its own role and influence on gender issues. Although it is not easy to determine which line of thought should be followed in order to reach the proposed project aims and be gender 'friendly' as well, it is recommended IDE defines better its own role and attitude versus the inclusion of both men and women in their RPI project.

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1. Introduction

The treadle pump is designed as a tool to make small-scale irrigation accessible to poor rural households. A treadle pump is a simple, human powered device and can be manufactured and maintained at relatively low cost. The treadle pump can be used to pump water from aquifers not deeper than 7 meters or can be used to pump water from rivers or dambos. In Zambia, where land is abundant and enough water is stored in shallow aquifers, the treadle pump seems to be a solution to provide poor farmers a more easy access to irrigation water and thereby improving the productivity and the livelihoods of smallholders.

In Zambia, IDE is one of the development aid organizations promoting treadle pumps. In 2006 IDE started the project Rural Prosperity Initiative. Within this project, IDE tries to strengthen the linkages between irrigation development and poverty alleviation by helping smallholders becoming more effective market participants. Aim of the project is to increase the net annual income of 6000 rural smallholder families by at least $ 200 and to increase the net annual income of another 8000 rural smallholder families by $ 100 (IDE, 2008).

An analysis of an IDE dataset, done in 2007, showed indeed an increase of income when Zambian small-scale farmers adopted the treadle pump (Hiller, 2007). However it is not clear yet how the additional production and income benefits the different individuals in a household. IDE beliefs the adoption of a treadle pump benefits all members of a household. However, considering gender, the introduction of new technologies may have differential impacts on the well-being of men and women (Doss, 2001). In Zambia men and women living in the same household have often different roles, responsibilities, access to resources and separate incomes and expenditures. This could mean that the needs of men and women using treadle pump technology also differ. To make sure the introduction of technology is indeed positive for all members of a household, an understanding of the different roles and needs of both men and women is therefore important. Only then, according to most feminist researchers, approaches and interventions for introducing technology can be developed which have the biggest chance for success.

However developing approaches and interventions for introducing technology which are positive for all members of a household, and then specifically women, is difficult. Development aid organizations, such as IDE, have to deal every day with the complexities which underlay gender and development. For most development aid organizations it is not easy to determine which line of thought should be followed in order to reach the proposed project goals and be gender 'friendly' as well.

Objective and research questions
IDE was during my period of field research in Zambia seeking for ways to address gender issues in their RPI program. This research tries to put IDE's efforts to ensure that its RPI project and the introduction of treadle pumps are positive for both men and women in perspective. This objective leads to the central question of my study:

Which gender ideas of IDE Zambia inform its RPI project and their approaches for introducing treadle pumps in Zambian rural smallholder households, what are the impacts of these ideas on field level and how do these ideas fit in the bigger context of gender and development?

This central question of research will be answered with the help of a case study done in Kabwe and Kafue, which are two target areas of IDE. By analyzing the interviews, observations and literature study of IDE policy documents, done during my period of field research, I will try to find out which approaches IDE uses within its RPI program for introducing treadle pumps and what effects these

approaches have on the gender relations in Zambian rural households. With the results of my field research it will then be possible to answer the above stated main question.

The final results of my research will make an contribution to the IWE project 'IWE research project for IDE funded small technologies program in pro-poor irrigation techniques', which is set up in cooperation with IDE and LEI.

Methodology
During my research in the field I collected data in two different project area's of IDE: Kafue and Kabwe. I selected these areas, because they are relatively new target areas of IDE Zambia. To assess how the treadle pump affects both men and women it is necessary to make a comparison between the years before adoption and the years after adoption. I expected that late adopters of the treadle pump had a better picture of how things changed when the pump was introduced than early adopters. Because the project started in both Kafue and Kabwe in 2006, I assumed that most rural families who owned a treadle pump were relatively shortly farming with this irrigation technology. Nevertheless in both Kabwe and Kafue some farmers who were interviewed owned their pump longer than 2 years, because of older projects in which treadle pumps were promoted. However the memories of these farmers appeared to be sharp and they could all remember very well how things were before they adopted the pump.

In Kafue and Kabwe I interviewed 16 farmers in 8 different villages. These interviews were semi-structured and were combined with a visit to the household and the farmer's fields. The interviews are included in Appendix A and B. With the help of field officers, I tried to select farmers who were irrigating with different technologies and were representative for the different farmers involved in IDE's RPI program. Because this research focuses specifically on the effects of treadle pumps on gender relations in rural households and communities, I decided to interview at least 8 farmers who were owning a treadle pump, although their number is not in line with the actual percentage of farmers owning a treadle pump. All the interviewed farmers lived in households from which one of its members, usually the man, was registered with IDE. I interviewed 8 men and 8 women, from which all the interviewed men and one of the interviewed women were head of the household. From the interviewed men 6 used a treadle pump, 1 used a bucket and 1 used a motorised pump. Two of the interviewed men were living in a polygamous household. From the interviewed women 2 used a treadle pump, 5 used a bucket and 1 used a motorised pump. I decided to not indicate the results of my field research with percentages, because the interviewed group of farmers it too little for a statistical representative sample. However, this does not mean the gathered information does not represent the impact of IDE's project approach on gender relations in rural households and communities.

Next to semi-structured interviews I observed the trainings and farmer meetings of IDE in Kafue and Kabwe and I talked informally with IDE employees, farmers and other NGOs working in the area. These observations and informal talks proved to be an important method in this study to collect a lot of information. Through observing the activities of men and women during the door-to-door interviews, meetings and trainings I could identify the different roles of men and women and the impact of IDE's RPI approach on gender roles.

Finally, before and after my field research I conducted a literature review of IDE documents and scientific literature. This helped me to understand the things I saw in the field and helped me in defining IDE's project approach and their ideas about gender.

Outline of thesis
In the next chapter some more information about Zambia and the two areas of research, Kabwe and Kafue, is written down. This chapter will hopefully contribute in a better understanding of the 'Zambian context' in which I conducted my research. In chapter 3 I deal with some theory about gender and development. Within this chapter theory is described and discussed which will help to

analyze the data of my case study and determine the bigger context of gender and development in which IDE is working. In chapter 4 I describe IDE's project approach and ideas about gender, which inform their RPI project. The assumptions of IDE about gender are tested against reality in chapter 5, in which I describe the results of my case study in Kabwe and Kafue.

2. Research background

This chapter will provide background information on Zambia and the two areas of research, Kabwe and Kafue. First, Zambia and her political situation, climate, geography, socio-economic situation and agricultural sector is described. Secondly, Kabwe and Kafue are briefly introduced. This chapter will hopefully contribute in understanding better the 'Zambian context' wherein the field research was conducted.

2.1 Zambia

The landlocked Republic of Zambia is located in Southern Africa and covers an area of 752610 km2, which is an area 18 times bigger than the Netherlands. The neighbouring countries are the Democratic Republic of the Congo to the north, Tanzania to the north-east, Malawi to the east, Mozambique, Zimbabwe, Botswana, and Namibia to the south, and Angola to the west. The capital city is Lusaka, located in the southeast of the country. Zambia is one of the most highly urbanised countries in sub-Saharan Africa. From the 11.7 million inhabitants, almost 40% lives in one of the bigger Zambian cities. The population is concentrated mainly around the capital and the Copperbelt to the northwest. The rural areas of the country are sparsely populated and the population density of 15.5 inhabitants per square kilometre is therefore still very low. Within urban areas unemployment and underemployment are serious problems, while most rural Zambians are subsistence farmers. (CIA World Fact Book, 2008)

Political situation

Before independence Zambia was called Northern Rhodesia and was administered by the British South Africa Company from 1891 until it was taken over by the UK in 1923. During the 1920's and 1930's, advances in the mining sector spurred development and immigration. In 1964 Zambia got, without much fight, her independence. Elections in 1991 brought an end to one-party rule, but the subsequent votes in 1996 and 2001 were marked by harassment of opposition parties and administrative problems. (CIA World Fact Book, 2008) The last president of Zambia, Levy Mwanawasa, was re-elected in 2006 for a second and last term. The last elections were deemed free and fair. The government of President Mwanawasa can be characterized by it's fight against corruption, which led to modest results. Mwanawasa was not able to fulfil his last term. He died this summer because of the consequences of an heart attack. (Minbuza, 2008)

Figure 2.1 Zambia. Source: CIA World Fact Book

Geography and climate

Except for the Zambezi valley and Luangwa valley escarpments, which are mountainous and rocky, the country is by and large a level to gently undulating plateau. Interfluves, which occupy large tracts of land in the main drainage systems consisting of the Zambezi, Luangwa,

Luapula/Chambeshi and Kafue rivers, mostly comprise deep weathered soils. Major soil types include black clays and sandy clays commonly found in the Kafue basin and the dambo area's, which are low-lying and therefore naturally wet areas during a large part of the year. In plateau areas red clays, sand veldt and clay loam soils are common soil types. These soils are generally of moderate fertility status with no salinity problems. (FAO, 2005a)

Although lying within the Tropics, because of it's high altitude Zambia enjoys a subtropical climate. Lusaka has, for example, an altitude of 1500 m above sea level. Zambia's climate can be characterized by two seasons. The cool and hot dry season from May to October and the wet season between November and April. Within the dry cool period and the hot dry period rainfall is absolutely absent and full-serve irrigation and wetland utilization becomes important. The dry cool period, from May to July, exhibits low temperatures averaging up to 16 ℃. On the contrary, in the hot dry period maximum daily temperatures of 30 ℃ and 40 ℃ are not uncommon. The wet season is in every respect characterized by rainfall. December, January and February are the wettest months. (FAO, 2005a)

The mean annual rainfall is 1020 mm. In the south of Zambia the mean annual rainfall is lowest, at 750 mm, while the central parts of the country get between 900 and 1200 mm rain and the north about 1400 mm rain. According to this rainfall distribution, the country can be divided in three agro-ecological zones representing the south, central and northern parts of Zambia. Rainfall totals and intra-seasonal distribution vary greatly from year to year, particularly in the south. This makes rainfed agriculture, which is easily effected by droughts highly undependable. (FAO, 2005a) Although last wet season rainfed agriculture, especially the growing of maize, was not effected negatively by too little rain but by too much rainfall.

Socio-economic situation

Once Zambia could be classified as a middle-income country, but began to slide into poverty in the 1970's due to a crisis in the copper mining sector. According to the 2007 Human Development Report of the United Nations Development Programme, Zambia is ranked 165th out of 177 countries in the human development index, which is a very low score. The human development index is based on three dimensions of human development: life expectancy, adult literacy rate, and having a decent standard of living. Out of the three dimensions of human development Zambia scores very low on two. (UNDP, 2007)

Especially life expectancy in Zambia is low. Life expectancy at birth has worsened in the last 40 years: it was 43 years at independence (1964), improved to 51 in 1980, but in 2002 declined to even 33 years. At the moment life expectancy at birth is 38,6 years (CIA World Fact Book, 2008). The low life expectancy figure can be explained by the high rate of HIV/AIDS prevalent within the population. HIV/AIDS prevalence is estimated to be about 20 percent of the adult population. Some records (of certain health centres) even suggest a HIV/AIDS prevalence rate ranging from 30 to 40 percent. Provinces with the highest urban population, such as Lusaka, Copperbelt, Southern and Central also have the highest levels of HIV prevalence. Districts which have more than 20 percent prevalence rates include Kabwe, Chingola, Kitwe, Ndola, Chipata, Kafue, Lusaka, Livingstone, Mazabuka and Mongu. (FAO, 2005b)

Zambia scores relatively high on education, with an adult literacy rate of 68 percent (UNDP, 2007). The relatively high literacy rate can primarily be attributed to the first president of Zambia, Kenneth Kaunda (1964-1991). With independence the nation's educational system was one of the most poorly developed in all of Britain's former colonies. Kaunda invested heavily in education and the level of schooling. Within one of his policies, all children, irrespective of their parents' ability to pay, were given free exercise books, pens and pencils. However, due to the crisis in the copper mining sector the government was forced to cut down their expenses on education. In 2000 school life expectancy was for both male and female seven years (CIA World Fact Book, 2008). While most small children who completed their primary education in the 1970's were able to speak English;

because of the declining level of education, a child who speaks English today is no longer self-evident.

About 64 percent of the population in Zambia is living below the poverty line of one US dollar a day and 46 percent of the total population is undernourished (UNDP, 2007). Between 1975 and 1995 Zambia's per capita income fell by 60 percent due to the crisis in the metal mining sector. Since 1999, the Zambian economy has been showing signs of recovery with positive GDP growth rates. In the last couple of years (2005-2007), the expansion in copper mining, a growth in construction activities and a growth in agricultural production have been the main drivers for a GDP growth of 5-6 percent. (FAO, 2005b) Despite the positive growth in the last ten years, Zambia's GDP per capita remains low at an average of 1,023 US dollars in 2005 (UNDP, 2007). Although poverty continues to be a significant problem in Zambia, it's economy has strengthened and Zambians are carefully positive about their country's future.

Zambia received $ 1,081 million of official development aid in 2004, which constitutes 20 percent of Zambia's total GDP. Next to the official development aid, Lusaka has a large business of NGOs who are financing many of the smaller projects in the country. In April 2005, the International Monetary Fund and the World Bank agreed that Zambia implemented the series of economic measures and structural reforms to reach the completion point under the enhanced Heavily Indebted Poor Countries (HIPC) Dept Initiative and was eglible for debt service relief of about US $ 3,9 billion. (FAO, 2005b)

Agriculture

Zambia has a considerable untapped potential for agriculture compared with many African countries. Its geographical profile is characterized by a vast plateau consisting of permanent pastures (representing about 85 percent of the country's agricultural land) with some fertile valleys along the main rivers Zambezi, Kafue and Luangwa. Nearly 75 percent of the population directly or indirectly depends on the agricultural sector which accounts to 22 percent of the national GDP. (FAO, 2005b)

The vast majority of farmers, about 800 000 households, own less than 5 hectares of land. These small-scale farmers use very basic production technologies, rely on family labour, recycled seeds, a hoe and minimal quantities of fertilizers. They are responsible for about 65 percent of the national production of maize, 75 percent of groundnuts and 85 percent of sorghum. Most of the production is retained for self-consumption. Some 50 000 farmers cultivate between 5 and 20 hectares using draught power and purchased inputs (hybrid seeds and fertilizers). They are mostly located along what is known as the 'line of rail' built before independence to connect Southern Rhodesia with Livingstone and Lusaka to the Copperbelt province. Most of the these farmers produce a mix of food and cash crops. About 700 large scale farmers own between 20 and 150 hectares using mechanized farming techniques and growing maize and cash crops. Only a dozen of large corporate farmers, often white farmers, own more than a thousand hectares with high levels of mechanisation, irrigation systems and hired labour force. An increasing number of commercial farmers formerly based in Zimbabwe are now moving to Zambia. Most of the commercial farmers produce tobacco and cotton. (FAO, 2005b) (FAO, 2005a)

Zambia's agriculture is mainly rainfed with the main growing season from October/November to April/May. Maize is the staple food in most parts of the country. Cassava is grown as main staple in the Northern, Luapula and North-Western provinces. Other important crops for local diet are sorghum, millets and sweet potatoes. Main cash crops are ground nuts, tobacco, cotton, coffee, paprika and cut flowers. Within the rainfed agriculture drought occurrences continue to depress food production and in some years food insecurity threatend 80 percent of the population. (FAO, 2005b) (FAO, 2006)

Within recent years, the agricultural sector has been given top priority by the Zambian government. In particular because mining activities sharply declined between 1975 and 1999, but also, according to the Zambian government, because of the enormous agricultural export potential. Considering the agricultural export increased from US $ 46,5 million in 1995 to US $ 133,9 million in 1999. (FAO, 2005a) In July 2002, the Zambian Government officially launched the implementation of programmes and activities under the framework of the Poverty Reduction Strategy Paper (PRSP) in rural areas. The programme aims at supporting vulnerable households through the provision of subsidized agricultural inputs as fertilizer and seed, out-grower schemes, maize marketing, the development of land and infrastructure and agricultural extension. (FAO, 2005b)

Irrigation

Zambia has about 40 percent of the waters in Southern Africa (FAO, 2005b). In addition an extensive area of 25 000 km2 is covered with Limestone aquifer layers extending from Lusaka to the northwest (FAO, 2005a). Although Zambia is water abundant, for many farmers (mainly smallholders) it is not possible to benefit fully from this asset because the necessary infrastructure and techniques to access water are not available or too expensive. The total water withdrawal was 1.737 km3 in 2000, with agricultural water use accounting for 1.320 km3 or 77 % of the total water withdrawal (FAO, 2005a). Irrigable land is estimated at 420 000 hectares, but less than 10 percent is actually irrigated, mostly by large, often foreign farmers (Hiller, 2007).

Within Zambia FAO distinguishes three types of irrigation, according to the size of farming land. Small-scale irrigation, which covers a total area of 11 000 hectares. Secondly, medium-scale irrigation schemes, which cover a total area of 7372 hectares. And large-scale commercial irrigation schemes, which cover a total area of 37 015 hectares. (FAO, 2005a)

Small-scale irrigation in Zambia is characterized by vegetable-growing, mainly on dambos and riverbanks. Where groundwater is available, farmers often dug shallow wells to irrigate their crops in their vegetable gardens. They apply water using buckets, watering cans, or pumps for lifting water from their shallow well or nearby river. Small-scale irrigation is usually not capital intensive and is farmer-operated. Area's irrigated in this manner are usually small in size ranging from a ½ hectare to 1 ½ hectare. (FAO, 2005a) The labour input necessary for irrigation is often dependent on the labour availability within the household. Within Zambia labour availability is an important constraint for rural smallholders.

Medium-scale irrigation schemes are often developed by the government. In the 1960's and 1970's the government developed and managed for example smallholder irrigation schemes. Most of these irrigation schemes have not performed well. The government's current policy is to rehabilitate or complete construction of these schemes and transfer the management responsibility for operation and maintenance of the systems to its users. Large-scale irrigation schemes are often privately owned. These have been developed purely on economic lines and grow high value commercial crops for export and local consumption. (FAO, 2005a)

In Zambia several governmental institutions are responsible for irrigation and water management. The Department of Field Services of the Ministry of Agriculture and Cooperatives and the Ministry of Energy and Water Development are most important. The current irrigation policy and strategy is to shed the dependence on the volatile production from rainfed systems and ensure food security. Beyond the satisfaction of basic needs, the government thinks irrigated agriculture can make a major contribution to poverty alleviation and economic growth. Next to the efforts from the government, the private sector and NGOs, as IDE, play an important role in the irrigation sector. In particular in the community mobilisation for irrigation, with respect to smallholders adopting irrigation. (FAO, 2005a)

2.2 Research Areas

Both Kafue and Kabwe are target areas of IDE Zambia. Kabwe is situated along the Great North Road, which leads to the Copperbelt. The town is a 2 ½ hours drive north from Lusaka. Kafue is situated south of Lusaka, along the road which leads to Livingstone and Zimbabwe. Kabwe counts around the 200.000 inhabitants. Kafue counts a little bit less than 150.000 inhabitants.

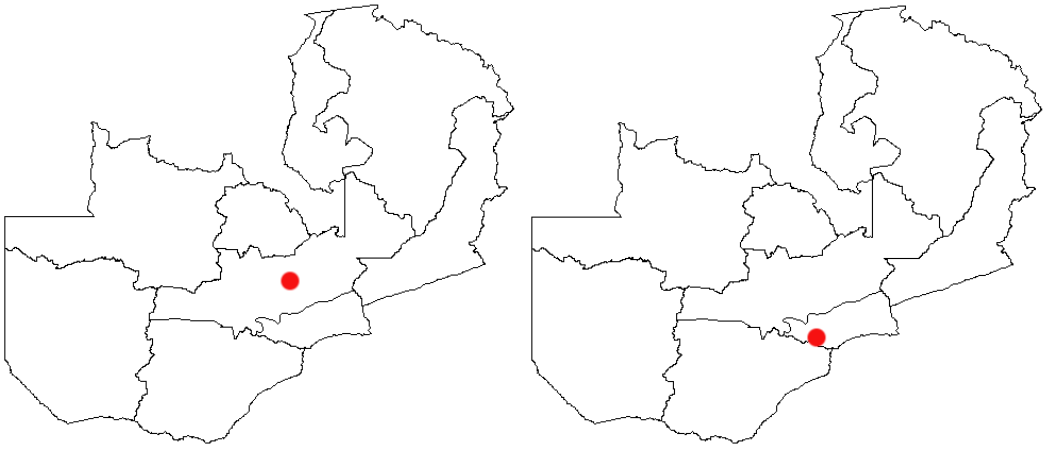

Figure 2.2 Kabwe (left) and Kafue (right) Source: Wikipedia

The rural area around Kabwe and Kafue is sparsely populated. Villages are rare and often far apart. Except for some, often foreign owned commercial farms, only small plots of land are cultivated. As described earlier, these plots are cultivated in a labour intensive way, with little use of chemicals, fertiliser or equipment. Most crop production, as the growing of maize, is rain fed. Farmers who have a vegetable garden, are irrigating their crops mainly with buckets or watering cans. Other irrigation methods, including the IDE promoted treadle pump, are for most farmers too expensive to purchase. Crops grown in the vegetable gardens are eggplant, tomato, rape, sweet potato, okra, green pepper and fruits. Next to maize, groundnuts are an important rain fed crop.

Most smallholders around Kafue and Kabwe are growing crops for home-consumption. Because cash is needed as well, to pay the school fees for example, a part of the yield is sold on the market. The production surplus is sold in the village, along the main tar road and on the city markets of Kafue, Kabwe or Lusaka. Getting the produce to the market is often difficult for farmers, because of the lack of transport and the bad condition of roads.

2.3 Conclusion

Zambia is a poor, but political stable country. Except from some copper in the north of the country, Zambia has little valuable resources. This makes the national economy sensitive for the performance of the copper mining industry.

Most Zambians are depending on agriculture for their survival. Nearly 75 % of the population is directly or indirectly involved in the agricultural sector. The vast majority of farmers owns less than 5 hectares of land. These small-scale farmers use very basic production technologies, rely on family labour, recycled seeds, a hoe and minimal quantities of fertilizers and chemicals.

Within recent years, the Zambian government and development aid organizations showed a renewed interest in agriculture, especially in small-scale farming. Farming is seen as a way to alleviate poverty and stimulate the national economy. Alleviating poverty and stimulating the national economy by helping small farmers to farm more efficient, is however not easily done. Although land and water are on most places in Zambia abundant, smallholders face many other constraints to expand their production. As stated in both the general description of Zambia and the short introduction of the research areas, important constraints are a difficult access to markets, a difficult access to fertilizers and chemicals, and a lack of suitable and affordable irrigation infrastructure.

IDE is thus one of the development aid and governmental organisations working within the rural areas of Zambia. Within its RPI project IDE tries to nullify some of the above described constraints and thereby raise farmers production and income. However succeeding in nullifying constraints and raise farmers produce, will not automatically mean a benefit for all members of a rural household, especially considering women. Within this research it will become clear that combining attempts to lift important market constraints for Zambian rural smallholders with attempts to be gender sensitive as well is not always easy.

3. Theory: Gender and Development

To be able to analyse the data of my field research in Kabwe and Kafue and answer my central question, some theory about gender and development is needed.

Within this chapter theory is described and discussed which will help to determine the gender effects of introducing treadle pumps within Zambian rural households and will also help to put the prevailing ideas and approaches of IDE, about the effects of introducing treadle pumps on women and men, in perspective. First the concept gender is described. The theoretical ideas which are discussed will help analysing my field data. Because within most development projects women are the vulnerable group, special attention is paid to their roles, responsibilities and needs. Secondly, Third World policy approaches towards women in development, their historical context and their implications for development aid are discussed. This theory will help to position my field results and, thus, the working methods of IDE in the wider context of gender and development.

3.1 Gender as concept

The concept gender emerged in the academic world when feminist theorists sought to understand the complexities of women's subordination some 15 years after the re-emergence of late-20th-century feminism. One of the earliest uses of gender in feminist theory can be traced to the 1976 University of Sussex Workshop on the Subordination of Women and the school of thought which emerged from this workshop. Scholars, who took part in this workshop, argued that women, like men, are biological beings but that women's subordination was socially constructed and not biologically determined. They argued further to distinguish the biologically founded sexual differences between women and men from the culturally determined differences between the roles given to or undertaken by women and men in a given society. (Parpart et al., 2000)

Gender does thus not depend on the biological differences between men and women, but upon the social relations between them. These gender relations are a social construct and constituted in terms of the relations of power and dominance that structure the life chances of women and men. They are revealed in the division of labour and resources between women and men, but also in ideas and representations. According to one of the scholars Ann Whitehead, who took part in the Workshop on the Subordination of Women, gender relations take often the form of male dominance and female subordination (Ostergaard, 1992). Gender roles and responsibilities are dynamic. In particular, they change with new economic circumstances. But can also change when new technology is introduced and adopted. (Doss, 2001) Because gender is a social construct, heavily influenced by society and therefore subject to change, the concept became the focus of attention for many feminist theorists (Parpart et al., 2000). From the 1970s, within feminism, gender became an analytical tool to understand social realities with regard to women and men (Agarwal, 1997).

Gender relations, the family and the household
Within feminist research, especially within studies related to the role of Third World women in development, the family and the household are important arenas of analysis. Also this research, specifically the case study in Kabwe and Kafue, focuses on households and the relations between its members. In the economics literature the tendency has been for long to assume that it is appropriate to treat the household as a single economic unit. (Doss, 2001) This unitary model of the family treats the household as a single entity in relation to both consumption and production. It assumes that all household resources and incomes are pooled, and that resources are allocated by

an altruistic household head who represents the household's tastes and preferences and seeks to maximize household utility. (Agarwal, 1997)

Within the past twenty years, literature in economics and gender has challenged this traditional model of the household, emphasizing the importance of understanding the dynamics within the household (Doss, 2001). According to these ideas households are constituted of multiple actors, with varying (and often conflicting) preferences and interests, and differential abilities to pursue and realize those interests. Households are arena's of consumption, production and investment, within which both labour and resource allocation decisions are made. Evidence from many developing regions shows that this family decision-making reveals persistent gender inequalities in the distribution of household resources and tasks. (Agarwal, 1997)

The increasing criticism on the unitary household models has lead to alternative approaches, which take the intra-household dynamics into account. These approaches cover a diverse range: cooperative, non-cooperative, collective, or some mix of these. Most models characterize household decision-making as some form of 'bargaining'. According to the bargaining approach, intra-household interaction contains elements of both cooperation and conflict. In relation to who does what, who gets what goods and services, and how each member is treated, household members decide to cooperate or non-cooperate. Normally, cooperation is more beneficial to the negotiating parties than noncooperation. However, among the set of cooperative outcomes, some are more favourable to each party than others. Some cooperative outcomes will involve one person's gain and another person's loss; hence the underlying conflict between those who cooperate. Which outcome will emerge depends on the relative bargaining power of the household members. (Agarwal, 1997) A member's bargaining power within the household is determined by factors that affect an individual's utility or well-being outside of the household. Examples are individual income, control or access to land and other inputs, kinship networks, and other legal or social structures. (Doss, 2001) Therefore, it is important to not analyse intra-household dynamics in isolation. Intra-household dynamics can only be pictured fully when the extra-household socio-economic and legal institutions in which a household is embedded are examined as well. (Agarwal, 1997)

The criticism on unitary household models had and still has important implications for development projects all over the world. An example are development projects where new agricultural technologies for smallholdings are introduced. Ideally and often assumed in development programs, improved agricultural technologies would increase the agricultural productivity of men and women farmers. However, new technologies often have positive and negative effects, which are according to the intra-household models different for the different members of a household. New technologies that increase output may also increase women's labour input. This may add to women's labour burdens (a negative effect), but simultaneously increase their control over the output (a positive effect) or maybe increase the husbands control over the output (a negative effect). (Doss, 2001) Within such projects, especially feminist research has convincingly shown that an increase in income of one member does not necessarily lead to improvement in the well-being of all members of a household and that the introduction of new technology has different impacts on the well-being of men and women. (O'Laughlin, 2007) (Doss, 2001)

The division of labour and women's responsibilities

As stated above gender relations are most clearly revealed in the distribution of tasks, responsibilities and resources between men and women. When technology is introduced, as in this research the treadle pump, an understanding of the different roles of both men and women is important. Only then the effects of introducing technology on the different members of a household can be studied.

Within most households certain tasks are performed by men and certain tasks are performed by women. Not long ago such divisions of labour were perceived to be rigid and universal. Feminist

research showed however that the division of tasks at any point in time vary from one country to another. As countries undergo economic change and the nature of work changes so does its distribution between men and women. It is this recognition that has caused feminists to challenge two basic presumptions of the gender division of labour. First that the division of labour is 'natural'. Second that the division, often made in both Third World as First World countries, between the male breadwinner and the female home-maker is based on a perceived complementarity of roles for men and women, who are 'different but equal'. (Moser, 1993)

In most low-income Third World households, women have multiple responsibilities and tasks. 'Women's work' usually includes reproductive work, productive work and community managing work (Moser, 1993). The reproductive tasks comprise the childbearing and childrearing responsibilities plus the domestic tasks, required to guarantee the maintenance and reproduction of the labour force. In almost all societies men do not have clearly defined reproductive roles. Taking care of children and household related activities, as cooking, gathering fuel wood and water, are in most countries women tasks. Considering the bargaining approach it is important to note that women's reproductive work is often not seen as an actual contribution to the household's prosperity. During bargaining the perceptions of 'who' contributes 'what' often relate to the size of direct money-earning, rather than the amount of time and effort expended. Because a lot of women's time is spend on unpaid reproductive tasks, their bargaining position within the household is often less favourable than the bargaining position of men.

Next to their reproductive responsibilities, throughout the Third World most low-income women have an important role in earning income for the household as well. The common policy stereotype of the male as breadwinner is in most developing countries far from reality (Moser, 1993). In African societies it is for example not unusual that men and women separately control productive resources, take partly independent decisions about these resources and manage their own income (Guyer, 1986). In cases where women have separate access to land it is common for them to work both on their own small plot and contribute to household production as unremunerated labour in the fields of male household members as well. Mostly, in sub-Saharan Africa women grow crops for household consumption, while the production of cash crops is the responsibility of husbands or male kin (Kamwamba, 2004).

Just as men, women undertake community managing work. However, women and men often play different roles in their community. In African countries the spatial division between the public world of men, and the private world of women, means that for women the neighbourhood is an extension of the domestic arena, while for men it is the public world of politics. This often means that while women in their gender-ascribed roles of wives and mothers are involved in community managing, men are involved in community politics. (Moser, 1993)

Next to the fact the division of labour and responsibilities between men and women is always subject to change, it is important to realise that the distribution of tasks is not solely based on gender. Class, ethnicity or education are also important factors determining the division of responsibilities within and outside a household. Consequently women's responsibilities, but also women's view on what tasks are indeed their responsibilities, may be determined as much by their class position, educational level or their ethnic identity as by their biological similarity as women.

Practical and strategic gender needs

Men and women play thus different roles in society, with distinct levels of control over resources. As result men and women have often different interests and needs as well. While studying the effect of the introduction of treadle pumps on the gender relations within a household, not only an understanding of the different roles women and men perform is important, but understanding their different needs is essential as well. Considering women, Molyneux (1985) distinguishes 'women's needs', practical gender needs and strategic gender needs. The concept of 'women's needs'

assumes compatibility of interests based on biological similarities, while the concept of gender needs assumes compatibility of interests based on gender similarities.

Practical gender needs and strategic gender needs are connected with each other. For gender analysis, it is however useful to distinguish the practical and strategic gender needs. According to Molyneux (1985) strategic gender needs are the needs women identify because of their subordinate position to men in their society and are those needs which constitute women's real interests. Strategic gender needs vary according to particular contexts. They relate to gender divisions of labour, power and control. Strategic needs may include issues as legal rights, domestic violence, equal wages, and women's control over their bodies. By trying to meet strategic gender needs, developing projects often attempt to achieve greater equality for women. Meeting these strategic gender needs often involve a change of existing roles. Practical gender needs are the needs women identify in their socially accepted roles in society. As Molyneux has written; 'they do not generally entail a strategic goal such as women's emancipation or gender equality… nor do they challenge the prevailing forms of subordination even though they arise directly out of them' (1985). Practical gender needs are a response to immediate perceived necessity, identified within a specific context. They are practical in nature and often are concerned with inadequacies in living conditions such as water provision, health care, and employment. (Moser, 1993)

The table below is based on a scheme which was used by Fiona Flintan in her research on gender and IDE's PRISM approach in Ethiopia and shows the differences between strategic and practical gender needs. (Flintan, 2004)

Table 3.1 Strategic and practical gender needs.

Strategic gender needs:	**Practical gender needs:**
• **Improves the status of women (and men)** • **May be harder for people to identify immediately** • **More often felt by women** • **Abstract: linked to the quality of social relations and the ideological** • **Likely to need a long-term process of change** • **For example: education, skills, confidence, self-esteem, being valued, participation and control**	• **Improves the condition of women's (and men's lives)** • **Easy to identify** • **Felt by most family members** • **Concrete: linked to the material quality of life** • **Can be achieved in the relative short-term** • **For example: food, health, water, income level household and physical conditions of work**

Source: Flintan, 2004

Although the theory of practical and strategic gender needs proved to be quite useful while analysing my gathered field data, the theory is much criticised as well. More specifically, criticism is especially directed towards Third World development projects, which use the theory about gender needs as their underlying rationale of gender planning. Not all of this project attention to women automatically leads to gender progressive change or to gender equity. Very few development projects succeed to improve women's status in society and some projects which try to meet

practical gender needs are even responsible for preserving or reinforcing a gendered division of labour (Moser, 1993).

3.2 Third World policy approaches to women in development

The above described theories about the concept gender and specifically about gender and Third World women, are based on a history of more than thirty years of gender study. Considering Third World women and development, which is the focus of this research, the pioneering work was Ester Boserup's book, *Women's Role in Economic Development*, published in 1970. After the appearance of this study, there was a silence and then a breakthrough in 1978 with a great number of new studies on Third World women. This productivity has continued since then with scientific papers, books, conference reports and policy documents and guidelines.

The early studies were mainly surveys and were later criticized for being descriptive, empirical and non-theoretical. In addition to the quantitative surveys, a tradition for in-depth qualitative studies developed, dealing with the women's functions in local communities, households, the village, etc. Although generalizations may be difficult on the basis of these micro-studies, these grass-roots investigations unveiled detailed information about women's roles in production and reproduction. Most importantly both the quantitative and qualitative studies about gender promoted a view which was in strong contrast to the existing one-dimensional and technocratic concept of development, also called modernization, which expects inputs of Western technology and know-how into well defined sectors of Third World societies, to promote economic development and to benefit all automatically. (Ostergaard, 1992) (Parpart et al., 2000)

3.2.1 Historical context of theorizing about women or gender within the development arena

The history of gender and development theory, which thus started with the pioneering work of Ester Boserup in 1970, is interwoven with the history of policy and project interventions in developing countries and with the history of the women's movement around the globe. Within particularly the last 25 years, there has been a proliferation of various policies, programs and projects designed by international organizations, NGOs and governments to assist low-income women in the Third World. Different views exist on how theoretical feminist frameworks are interwoven with the frequently changing interventions of international organizations, NGOs and governments throughout history.

Before considering the debate on how the concept gender and feminist knowledge is represented and mobilized in development policy and practice, an overview of the different policy approaches towards woman in the Third World is given. Maurya Buvénic (1983, 1986) was one of the first feminist researchers who made a categorization of the various policy and project initiatives concerning gender. She described that the tendency in Third World development policies and projects towards women could be described as a shift from 'welfare' to 'equity' to 'antipoverty'. In 1993 this categorization was complemented by Moser (1993) who defined two other approaches; the 'efficiency' and 'empowerment' approach. In fact these words depict a general trend in Third World policies from modernization policies of accelerated growth, through basic needs strategies associated with redistribution, to the compensatory measures associated with structural adjustment policies, to the more recent popular bottom-up empowerment approach.

Although the different policy approaches concerning gender are described chronologically; in practice according to Moser (1993) many policies have appeared more or less simultaneously. Implementing agencies have not necessarily followed any ordered logic in changing their approach,

most frequently jumping from welfare to efficiency without considering other approaches. Similarly, different policies have particular appeal to different types of institutions. Finally, shifts in policy approach often occur not only during the formulation stage, but also during the implementation process (Buvenic, 1986). The following described policy types in their historical context are mainly based on Moser (1993) and Parpart (2000). Next to the welfare, equity, antipoverty and efficiency approach, also more smaller feminist movements and ideas are described. While the welfare, equity, antipoverty and efficiency approach have their origin in governmental and international organisations, the empowerment approach and other less influential approaches are often practised by NGOs.

The 1930s
The first development initiatives, which had begun to preoccupy economists and colonial officials in the 1930s, largely ignored women. These approaches identified development with modernization and assumed a wholesale adoption of Western technology, institutions and beliefs. Obstacles to the modernization process in the colonies were traditional cultural practices and values, as well as existing social and economic infrastructures. Convinced by their technical superiority, Western development specialists defined Westernization and modernization as the same thing. (Parpart et al., 2000)

The 1940s and 1950s
During the 1940s and the 1950s, most projects, aimed to modernize colonies all over the world, were designed by western scientists and professionals. Many of these projects failed, but this did little to undermine most development expert's faith in modernization. From the late 1940s, when decolonization started, the new independent governments hired many of these former colonial development experts to help them fulfil their electoral promises, particularly the promise that independence would bring economic development and prosperity for all. Within these years the United States emerged as the hegemonic power of the post-war era and became the model for countries pursuing modernization. (Parpart et al., 2000)

The 1950s and 1960s
Within the 1950s and 1960s the earliest approach concerned with women in developing countries was introduced; the welfare approach. It's range of thought can be identified as pre-Women-in-Development, an policy approach which is being used after the 1970s, and can be linked to the model of social welfare which was used by colonial authorities. This development model of social welfare was based on the welfare programs the colonist states used in their own countries; widely initiated in Europe after Word War II. The post World War II welfare programs in Europe consisted out of two parallel approaches. On the one hand, financial aid for economic growth; on the other hand, relief aid for socially deprived groups as low-income women. This strategy, later replicated by colonial authorities but also newly independent Third World governments, had critical implications for Third World women. According to Moser (1993) this strategy meant "… that international economic aid prioritized government support for capital-intensive, industrial and agricultural production in the formal sector, for the acceleration of growth focused on increasing the productive capacity of the male labour force. Welfare provision for the family was targeted at women, who, along with the disabled and the sick, were identified as vulnerable groups, and remained the responsibility of often marginalised ministries of social welfare". The main method of implementing the welfare programs was (and still is) through top-down handouts of free goods and services (Moser, 1993). Examples are the direct provision of food aid, nutritional and birth control education.

The fact welfare provision for families used to be targeted at women in a top-down approach, can be explained by considering the three basic assumptions of the welfare approach. Firstly, women are seen as passive beneficiaries of development and not as participants in the development process. Secondly, motherhood is seen as the most important role for women in society. Thirdly, childrearing is seen as the most effective role for women in all aspects of economic development. Although the welfare approach sees itself as a 'family centred approach', it actually focuses on

women and specifically on women's reproductive role. Men's role is to be productive and women's role is to be reproductive, is the belief here. (Moser, 1993)

During the years welfare programs have widened their scope considerably. However, the underlying assumption is still that motherhood is the most important role for women in Third World development. Mostly, strategic gender needs are not taken into account. The program's major concern is meeting the practical gender needs of women and does therefore not question the traditionally accepted role of women within the division of labour. The welfare approach is thus politically safe and therefore still popular. (Moser, 1993)

The 1970s

Within the 1970s dissatisfaction with the welfare programs executed in Third World countries was widespread. Criticism came from different groups involved in development aid. First of all, a group of mainly female professionals and researchers were concerned with the increasing evidence that Third World development projects were negatively affecting women. As noted earlier, Boserup (1970) was one of the first who investigated the impact of development projects on Third World women. She discovered that most projects, beside the 'welfare provision for families' programs, ignored women and that in certain cases technologically sophisticated projects undermined women's economic opportunities and autonomy. Training in new technologies was usually offered to men. Boserup's study seriously challenged the argument, originating from modernisation theory, that benefits from development projects would automatically trickle down to women and other disadvantaged groups in Third World countries. Secondly, the welfare approach was criticised by development economists and planners who were concerned with the failure of modernisation theory in the Third World. (Moser, 1993) (Parpart et al., 2000)

The voicing of these concerns resulted in the United States in the Percy Amendment in 1973, which required gender-sensitive social-impact studies for all USAID development projects. Feminists who lobbied in the United States for an equal opportunity for women in the Third World, began to use the term 'women in development' or WID. (Parpart et al., 2000) In 1975 women were put internationally on the agenda. During the conference 'Equality, Development and Peace' in Mexico City, the United Nations launched the 'Women's decade' (1976-1985). During this decade the critique on the welfare approach resulted in the development of alternative approaches to women. Most of these approaches were formulated during the same decade and share many common origins. Often they are categorized together as the Women in Development approach. (Moser, 1993)

The original WID approach is in fact the equity approach. The equity approach's purpose is to gain equity for women in development. The underlying logic is that women have lost ground to men in the development process. Therefore, in a process of redistribution, men have to share in a manner which entails women from all socio-economic classes gaining and men from all socio-economic classes losing, when necessary through positive discrimination policies (Moser, 1993). Instead of the welfare approach, this approach recognises women as active participants in the development process. It acknowledges that women should be 'brought into' the development process through better access to education, training, property, credit and paid employment, in order to contribute to economic growth (Parpart et al., 2000). Although the equity approach assumes some gendered consultative and participatory planning, the emphasis is on top-down legislative measures (Moser, 1993).

The equity approach takes both the reproductive and productive role of women into account. This in contrast with the welfare approach, which was, among other things, strongly criticised because of it's one-sided view on the tasks women perform. As Tinker (1976) writes: 'development planners were unable to deal with the fact that women must perform two roles in society whereas men only perform one'. According to Tinker (1976) the welfare approach failed to acknowledge and utilise

women's productive role and even reinforced values which restricted women to household activities.

The second WID approach, or anti-poverty approach, was introduced just after the introduction of the equity approach. Its purpose is to ensure that poor women increase their productivity. Women's poverty is thereby seen as a problem of underdevelopment and not of subordination as stated by the equity approach. Women's issues are thus separated from equity issues and linked instead to poverty. According to Buvénic (1983) this shift to a toned-down version of equity can be ascribed to the reluctance of most development agencies to interfere with the manner in which relations between men and women are constructed in a given society. Although this may be partly true, as Moser argues (1993), the shift in approach can also be ascribed to the end of the unsuccessful First Development Decade. During the 1970s international development organisations recognise that modernisation theory had failed to redistribute income or to solve the problems of Third World poverty and unemployment. Financial benefits of economic growth had not, as expected by modernists, trickled down to the poor. In 1972 the World Bank officially shifted from a preoccupation with economic growth to a broader concern with the eradication of absolute poverty and the promotion of 'redistribution with growth'. Integral to this was the 'basic needs strategy', with its primary purpose to meet 'basic needs' as food, clothing, shelter and fuel, as well as social needs as education. WID specialists also adopted this approach, targeting poor women and their basic needs as the primary goals of WID policies (Parpart et al., 2000). This anti-poverty approach, as Moser (1993) points out, tries to serve women's practical gender needs by focusing on improving women's access to income through efforts as small-scale income-generating projects. Although these income-generating projects provide indeed employment for women, and thereby often meet practical gender needs, it is absolutely not certain strategic gender needs are met. Moser (1993) argues that within the anti-poverty approach the particular constraints that women experience in their gendered roles, as balancing productive work alongside domestic responsibilities, are frequently ignored. Also, the anti-poverty approach has the tendency to distinguish between micro-enterprise projects for men, and income-generating projects for women. This indicates an attitude according to Moser (1993) that, even among many NGOs, women's productive work is of less importance than men's and is undertaken as a secondary earner or 'for pocket money'.

During the 1970s, disappointments arose between feminists when national and international WID offices were co-opted or found their capacities diminished through inadequate funding and less political attention. Throughout this period, Third World feminists started to work independently from the 'WID-efforts' from national governments and international organisations. They began projects at grass-roots level on many issues concerning women. Some were following the equity or anti-poverty approach on a smaller scale, others followed new ideas. Some feminists called for example for women's projects that were completely separate from men's. They argued for a development approach to women that recognised the dangers of integrating women in a patriarchal world. This development approach is also called the WAD (Women and Development) approach and is, among other things, responsible for the still persistent call to recognise that women are the mainstay of agricultural production in many areas of Africa. (Parpart et al., 2000)

The 1980s

In the mid 1980s political conservatism dominated in Western governments and donor agencies, because of a global economic recession. This global recession hit especially the Third World countries hard, revealing structural flaws and weak economies. A growing preoccupation with economic mismanagement and underdevelopment in Third World economies began to replace the earlier mentioned concern with basic human needs. Unless all the criticism on the modernisation theory in the last decades, the international development agencies, particularly the World Bank and IMF, drew a conclusion consistent with the modernisation approach. According to the World Bank and IMF, Third World economies required structural adjustment to revive themselves and flourish. Under their supervision structural-adjustment programs (SAPs) were designed to reduce government expenditure and increase the power of market forces in Third World economies,

thereby increasing their productivity and efficiency. Thus, once again, the assumptions of liberal and modernist thinking dominated the SAPs, including the earlier mentioned assumption that economic prosperity would automatically benefit both women and men. (Parpart et al., 2000)

In this context the third WID approach, or efficiency approach, developed. It emphasises that increasing women's economic contribution will increase overall economic efficiency and it assumes that this increased economic participation of Third World women is automatically linked with increased equity. The efficiency approach focuses on the fulfilment of women's practical needs. At the moment it is a very popular approach, particularly with international development agencies and governments. (Moser, 1993)

However, most feminists are critical considering the impact of the efficiency approach on Third World women. Moser (1993) argues that the approach relies on an elastic concept of women's time. Disinvestments in human resources, made in the name of greater efficiency in IMF and World Bank policies, have resulted in severe cuts in government social expenditure programs, particularly health and education, and reduction in food subsidies. In the light of the elastic concept of women's time, women are seen primarily in terms of their capacity to compensate for declining social services by simply extending their working day. Also, most of the structural-adjustment plans define economies only in terms of marketed goods and services and subsistence cash production and exclude women's reproductive work. SAPs implicitly assume that unpaid domestic activities, as caring for children, gathering fuel, processing food and preparing meals will continue regardless of the way in which resources and productive labour is allocated. In rural areas for example the introduction of cash-crops has often meant increased agricultural work for women with less time for production of subsistence family crops or domestic tasks. In some cases this resulted in negative consequences for children's nutrition levels (Evans and Young, 1988) (Feldman, 1989). Thirdly, the assumption of the efficiency approach of an equal intra-household distribution of resources has been widely criticised (Moser, 1993). The criticism on the underlying assumption of SAPs that changes in resource allocations in income affect all members of the household in the same way, led to the development of the earlier mentioned bargaining approach, which takes dynamics in the household into account.

During the 1980s some feminists and development theorists remained unconvinced by both the WID and WAD approaches. These scholars and activists turned to the GAD (gender and development) perspective or empowerment approach. This approach emerged from the grass-roots organisational experiences and writings of Third World feminists. (Parpart et al., 2000) Its purpose is to empower women through greater, self-reliance. Women's subordination is not only seen as the problem of men but also of colonial and neo-colonial oppression. Also, the empowerment approach focuses on the interconnection of gender, class and race, because according to GAD feminists women experience oppression differently according to their race, class, culture and position in the economic order. The empowerment or GAD approach was first articulated by a group called Development Alternatives with Women for a New Era (DAWN). DAWN was launched publicly at the 1985 Nairobi international NGO forum; an event attended by 15000 women activists and held parallel to the official World Conference on Women. Within this conference DAWN called for an approach to women's development that will in the long-term transform the structures of subordination that have been so inimical to women. The empowerment approach tries to reach this goal by meeting strategic gender needs indirectly though bottom-up mobilisation around practical gender needs. During the 1980s the empowerment approach remained an unpopular approach, except for Third World Women's NGOs. (Moser, 1993)

The 1990s

During the 1990s, within the NGO sector, a rich diversity of paradigms continued to influence their development practice. The WAD and GAD or empowerment approach remained particularly popular with Third World Women's NGOs, who continued to organise their projects on grass-roots level. The continuous pressure, especially from these women's groups and NGOs, remained

significant and forced governments and international aid agencies to take women into account. However, the WID approach, specifically the efficiency approach, remained the dominant approach of governments, donor agencies and development agencies (both United Nations agencies and NGOs). In some cases, policies or programs adopted the empowerment approach as their newer, perhaps more fashionable label, but in the mean time continued to work within the WID paradigm. (Parpart et al., 2000)

As stated earlier it is therefore sometimes difficult to identify which theoretical paradigm underlies a policy or program and why shifts in approach are made. In the text below the debate on how the concept gender is represented and mobilized within the above described development approaches for women and the way these development approaches are interwoven with theoretical feminist frameworks is discussed.

3.2.2 Recent representations and mobilisation of the concept gender within development policy and practice

As explained above, gender and development has become, from the 1970s onwards, a distinctive field of enquiry and practice. On the one hand gender and development has become a recognized sub-discipline of feminist research; on the other hand 'gender' has gained official status within mainstream development. From only theorising about Third World women's issues in the 1970s, gender has now become institutionalised in advisory posts in donor agencies and non-governmental agencies, in masters courses in universities and in governmental departments.

Although feminist engagement with development has put 'gender' on the policy agenda, more and more feminists are currently questioning what has become of 'gender' in the development arena. In recent years, there has been a growing frustration with the simplistic slogans that have come to characterise much gender and development talk, and with the gap between professed intention and actual practice in policies and projects (Cornwall et al., 2007). Women often appear in narratives of gender and development policy as both heroines and victims. Heroic in their capacities for struggle; in the steadfastness with which they carry the burdens of gender disadvantage and in their search for autonomy. Victims as those with limited choices, a triple work burden and marked by male oppression and violence. A lot of feminist researchers argue that these development policy narratives are very far from the complexity of Third World women's and men's lives (Cornwall et al., 2007) (Jackson, 2007) (O'Laughlin, 2007).

If indeed these development policy narratives are far from the complexity of 'real' life, the question arises how bowdlerised or just wrong presentations of gender issues have become embedded in development within the last decades. According to Cornwall et al. (2007) these gender 'myths' in development policy stem from exigencies within the politics and practices of development bureaucracies, within the difficult politics of feminist engagement with development policy and practice and within feminist politics itself. In the text below the often difficult relationship between feminist knowledge and development policy and practice is further discussed.

Gender Myths

The sometimes difficult relationship between feminist knowledge and development practice can be carried back to the struggle for interpretive power; what languages, images, representations, narratives and stories, should be used to plan or mobilise change. Both development professionals and most feminists are seeking for ways that can change women's lives for the better. However gender feminists seem to 'frame' and 'name' problems which they encounter differently than development aid organisations or governments (Cornwall et al., 2007). Policies and policy-making can be represented as a technical matter, arising primarily from an assessment of evidence. However, the fact struggles over meanings exist within the gender and development arena,

suggests policy formulation about gender issues is a much more complex process. According to Hajer (1995) the making and shaping of development policies can be understood as a terrain of contestation in which particular framings of the problem and the solution come to gain purchase. These particular framings of a problem and its solution can be called story-lines, discourses or myths. The final representation of a problem, which will shape development practice in the end, is a reflection of institutional and individual power (Hajer, 1995). Which story-line or myth becomes important, thus, depends on who has a powerful voice.

While many development professionals would find the idea that policy is directed by belief rather than fact probably unacceptable, myths or story-lines play an important role in development practice according to Hirschmann (1967). He argues that in order to contend with the otherwise insuperable obstacles that such actors face in transforming conditions of misery and inequality, they need something to believe in. Development needs its own myths, according to Hirschmann, to guide and motivate action.

Although some feminist researchers agree with Hirschmann (Rocha, 2007), others sketch a less positive image of gender myths in development policy and practice. Jackson (2007), for example, considers myths as 'generalisations' and highlights the taken-for-granted and self evident character of myths. Most feminist researchers also emphasise the selectiveness of gender myths (Cornwall et al., 2007). They argue that when 'gender' has been taken up in development policy and practice, myths have been created that have emphasised some aspects of feminist agendas, and pushed others out of the frame. This resulted often in development projects which did not tackle the right problem or just a part of the problems women face.

As stated earlier, myths can stem from different sources. Within feminist knowledge there is no agreement which source of myths is most important in the gender and development arena. For some feminist researchers myths are 'out there'; created within the bureaucracy systems of development aid or donor organisations. For others, myths are what feminists make when they seek to influence the powerful. For yet others, myths and fables are what feminists live by in order to act for social transformation. (Cornwall et al., 2007) In the text below the different sources of gender myths in development policy and practice are further discussed.

Power and the institutional context

Within development bureaucracy it seems almost a necessary condition for institutionalisation of 'gender' ideas to be blunted and reduced to slogans and ideals (Cornwall et al., 2007). Ideas are domesticated to fit the exigencies of agency procedures and priorities. This simplification of gender and development ideas within the institutional context of development organisations, can be explained by the need to motivate and guide action. As stated earlier, a simple story-line helps to get things done, especially in larger development bureaucracies.

Next to 'getting into action', 'power' is also a major factor in the creation of gender myths. The power relations within the development arena do not only simplify gender ideas, but transform them as well. Bureaucracies have the tendency to incorporate information on their own terms, privileging that which fits in with their own views of the world (Goetz, 1994). Mosse (2005) argues that the policy of bureaucracies primarily functions to mobilise and maintain political support. Also in the gender and development arena often holds that policy formulation is not to orientate practice, but to legitimise practice.

An example of how large development bureaucracies transform gender ideas and thereby legitimise their policies, is given in an article by de la Rocha (2007). In the 1980s she did research on the urban poverty of Guadalajara, Mexico, in a period of economic crisis when the already low-waged urban poor suffered a dramatic fall in purchasing power. Her work expanded understanding of poor people's strategies for survival and was picked up by the World Bank. Within its policies, the World Bank emphasised the idea that the poor have an infinite capacity to withstand shocks and

crisis though multiple strategies. Later research of de la Rocha, brought into question this 'myth of survival'. In a research of 1994 she found severe limitations on the capacity of poor households to adapt to adverse economic conditions. Although her first study in which poor households did have options to survive falling incomes from formal employment was picked up by the World Bank, her later work, which shows the severe limitations of these strategies, was ignored. De la Rocha (2007) forcefully makes the point that it is the World Bank's commitment to liberalisation that is behind the adoption of the myth of survival. The myth perfectly fits into the liberalisation policies and poverty approaches of the World Bank.

The research of de la Rocha shows that powerful institutions understand the importance of controlling discourse. Often (gender) researchers find that critical and reflective accounts do not find favour in institutions like the World Bank. Findings have to be endlessly rewritten and reshaped to be published or adopted. Gender specialists within large bureaucracies are often accused of being too academic and unable to translate their research into policy practice. According to Cornwall (2007) the tolerance level for differing views is even getting lower. Probably because major international players experience ever more pressure to show no doubts and admit no uncertainty.

Power relations within development transform research ideas also in another way. Within institutions like the UN the development of a policy agenda often depends on cooperation between the larger countries or key players. Protocols that imply the making of legislation are fought over word by word. The need for these globally binding agreements in for example UN policy may also be responsible for homogenisation of research findings. (Cornwall et al., 2007)

Myth making within feminism

Gender myths do not only develop within the practices and politics of development bureaucracies; also feminists are a source of myth making. Over the last decades most feminists became engaged, in some form or another, with development policy making. During their encounters with development most feminists experience pressures to simplify, sloganize and create narratives with the 'power to move'. In order to make place for new gender ideas within development organisations, alliances and diverse linguistic, narrative and presentational strategies are necessary. Influencing powerful international development bodies may for example require short, punchy messages preferably accompanied by 'fast' statistics, like the much quoted factoid which pictured women as the majority of the world's poor. Feminists who make myths as they push for policy change in development, are mainly driven by the conviction that it is better to make concessions than seeing no action at all. (Cornwall, et al., 2007)

Influencing development organisations or governments does not only require simplification or sloganizing of gender ideas, but also strategic choices on how to present scientific information. Goetz (2007) explains for example that while her own interventions in policy are motivated by her conviction of the need for gender justice, such convictions and their arguments are mostly not very persuasive for those designing policy. Arguments build on 'facts' instead of on convictions are much more powerful within the politics of influence. For example, arguments presenting a case that having more women in politics will reduce corruption and is thus good for the political system, hold much more sway.

It is not only because of influencing development or donor agencies, feminists are presenting simplified narratives; feminism has its own myths as well. These myths are linked with personal, as well as political, attachment to certain idealised generalisations about women. Cornwall (2007) argues that feminist attachment to certain ideas about women and about what is needed to improve their lives needs to be analysed in terms of the affective power of deeply held beliefs about women and their relationship with men. Feminist fables arise, thus, not solely from intellectual processes, but are also an expression of deep human emotions (Cassirer, 1946). A lot of feminists are for example attached to myths of female solidarity and female authority, which are according to these

gender professionals key elements in the liberation of women from male oppression. However, in gender studies men are not always the ones who cause women the most grieve. Other women are often mentioned as oppressors as well. (Goetz, 2007) Also, Jackson (2007, 2003) argues that marriage is not simply a site of subordination, but must rather be seen as a source of security and entitlements for women. The idealised generalisation of women in feminisms' own myths makes it often very difficult for gender researchers to confront their implications (Cornwall et al., 2007). This makes feminist fables probably the most complicated myths to enervate.

3.3 Gender and irrigation

During the history of gender and development theory, not much is written about Third World women and the introduction of pro-poor irrigation technology. Within new irrigation systems plots are usually given to the head of the household, the majority of whom is men. As Zwarteveen (1997) writes, in irrigation development projects it is rare women obtain irrigated plots on an individual basis, because of implicit and explicit assumptions about the intra-household organisation of agricultural production. Often policy makers and project planners fear that the allocation of plots to both men and women will result in lower overall irrigated agricultural productivity and the need for allocating plots to women is not clear, because it is assumed women will benefit from the plots of their husbands. However evidence from a study in Dakiri, Burkina Faso, shows that the productivity of both irrigated land and labour is higher in households where both men and women have an irrigated plot each, in comparison with households in which only men have plots (Zwarteveen, 1997). During the study it appeared that women are equally good as men or even better in irrigated farming, while their motivation to invest labour in irrigated production significantly increased when they had individual plots. The income of most women increased sharply when they owned their own irrigated plot. While the proportion of the labour women contributed to their men's plots was virtually the same, the increase of own income reduced the women's economic dependence on men, and strengthened their bargaining position within the household.

Although this research is not about land allocation in a new developed irrigation system, the findings of Zwarteveen's study in Burkina Faso show clearly the, often fallacious, assumptions policy makers and project planners have considering women and irrigation. In this research I will try to find out what assumptions IDE has about gender and the introduction of pro-poor irrigation technology.

3.4 Conclusion.

From the 1970s onwards gender became an analytical tool within feminism to understand the social realities with regard to women and men. Households in Third World countries were and still are an important topic of this gender research. Within mainstream thinking and theorising in economics and development policy the household is mostly considered as a single economic unit. Within the past twenty years literature in specifically gender research has challenged this traditional model of the household, emphasising the importance of understanding the dynamics within a household.

Accounting for the dynamics within a household, rural African households can be characterised as overlapping but semi-autonomous production and consumption units. In rural Africa it is not unusual women have access and control over a part of the household's farming land. Also, men and women within the same household have often different roles, different responsibilities and different needs.

This theoretical view of a household, which forms the point of departure in this research, has important implications for development programs. Also for the RPI program of IDE. Defining a household as a unit with different resource bases, different interests and different responsibilities,

means that the introduction of treadle pumps within Zambian rural households is not automatically positive for all members. Making sure the introduction of technology is positive for all members of a household, and then specifically women, is according to most feminists however a requisite for a successful program.

As can be concluded from this chapter, developing approaches and interventions for introducing technology which are positive for all members of a household, and then specifically women, is difficult. Within development, gender is namely a much contested concept. Gender is not an unambiguous term, but can have many different meanings to different stakeholders. The struggle about the best way to address gender in development projects is all about the struggle for interpretive power; what languages, images, representations, narratives and myths should be used to mobilise change.

Because the range of institutions engaged with gender and development is so diverse, many interests and views of the concept gender and development exist. Feminists, connected to a university or research institute, think of gender as an multifaceted concept and often argue that the existing development policy narratives are far from the complexity of Third World women's and men's 'real' lives. Development bureaucracies, as the UN or World Bank, are conversely not fond on complex gender stories. These organisations have the task to motivate and guide action and a simple story-line helps to get things done, especially in larger bureaucracies. Finally, differences exist between the views of different development organisations on what kind of development is good for gender equity. Some NGOs are for example convinced bottom-up approaches are the right tool to empower women, while others think, national law which takes women's rights into account, is important as well.

The above described ambiguous characteristics of the concept gender and the fact many different organisations are involved in gender and development resulted automatically in a proliferation of various policies, programs and projects designed to assist low-income Third World women. As described in this chapter these policies, programs and projects followed and still follow different approaches and different lines of thought. Therefore it can be very difficult to determine which gender approach is the best in a certain project or case, specifically in pro-poor irrigation projects, because not much is known yet about gender and pro-poor irrigation. This rises the question where IDE stands within the gender and development debate and what ideas IDE has about gender and the introduction of treadle pumps in Zambian rural households. Do they follow certain lines of though about gender, development and irrigation? As explained in the introduction, with the help of a case study in Kabwe and Kafue this central question of research will be answered. The next two chapters will provide more insight in the ideas IDE has about gender, what approaches they use within their RPI program to introduce treadle pumps, how the concept gender is used in their program and what effect the program strategy of IDE has on the gender relations within a household.

4. IDE, its project approach and gender

Within this chapter I will give some more insight in the approach and strategy IDE uses in its RPI program to introduce treadle pumps in Zambian rural households and in the general ideas IDE has about gender and development. Subsequently, in the next chapter I discuss how IDE's ideas about gender work out on field level and what effect the program strategy of IDE has on the gender relations within Zambian rural households.

IDE is one of the many development aid and governmental organisations working within the rural areas of Zambia. The strategy of IDE is focused on ending poverty through increasing incomes from small-plot agriculture (IDE, 2006). In 1996, the FAO commissioned IDE, then only stationed in Bangladesh and India, to examine the potential of the manufacturing and use of treadle pumps in Zambia for one of their new programs. In view of the need to stabilize the year-to-year food production, the FAO initiated namely a Special Program for Food Security in low income food deficit countries in the same year. Zambia was among the first of about 80 countries to confirm its participation in this program. A major component of the FAO program was the promotion of improved water use by introducing treadle pumps to individual farmers. In July 1997, IDE established an office in Zambia as a non-profit NGO with the principal aim of developing a marketing and promotional network for treadle pumps. (Kay and Brabben, 2000)

Today, IDE is still based in Zambia and started in 2006 a project called Rural Prosperity Initiative. As stated in the introduction of this research, within this project, IDE tries to strengthen the linkages between irrigation development and poverty alleviation by helping smallholders becoming more effective market participants. The introduction of treadle pumps still forms a major component of the project. Other irrigation techniques which are promoted by IDE are drip kits and the newly developed rope pump. Aim of the project is to increase the net annual income of 6000 rural smallholder families by at least $ 200 dollar and to increase the net annual income of another 8000 rural smallholder families by $ 100 (IDE, 2008).

Before I discuss the approach and strategy of IDE underlying the RPI project, I elaborate the RPI project a bit more.

4.1 RPI project

IDE Zambia started its project Rural Prosperity Initiative in the districts Lusaka, Livingstone and Choma. After further analysis, the Zambia team added Kazungula, Monze, Kafue, Chibombo and Kabwe districts to its target areas. All these districts have a high density of farmers, are situated along the main North-South road and rail links, are semi-urban areas and are therefore suitable for implementing value chains for farmer's produce. (IDE, 2007) According to IDE, smallholders living in these areas have thus a good chance to become more effective market participants and increase their income from agriculture.

RPI programs
The RPI project in Zambia consists of five programs: market linkage, linkage to input suppliers, linkage to irrigation techniques, linkage to credit facilities and capacity building and gender issues. IDE Zambia plays two different roles in the implementation of these programs in their project areas. First, IDE trains farmers in subjects as agronomy, gender, starting up farmer groups and market strategies. Second, IDE functions as a mediator between farmers and input suppliers, output suppliers, organizations who grant micro credits and other NGOs active in IDE's project areas.

Among other organizations, IDE Zambia works together with MEDA, Micro Bankers Trust, CropServe, Freshpickt and different businesses who sell treadle pumps. MEDA is an NGO who is at the moment distributing vouchers among IDE farmers, with which farmers can get a discount when they buy a treadle pump or drip kit. Micro Banker's Trust grants micro credits to farmers who are willing to buy irrigation equipment promoted by IDE. At the moment, with the help of IDE, farmers draw up business plans in order to apply for Micro Banker's Trust credits. CropServe is an input supplier of irrigation equipment and chemicals. Within the RPI program CropServe often gives demonstrations in the field so farmers can check out certain irrigation equipment as drip kits and hose pipes. Freshpickt is an wholesale business, who buys among other things tomatoes from IDE's farmer groups.

Most programs of IDE Zambia have already started; some more successfully than others. Only the program about gender issues has not begun yet. Probably within the second half of 2008 IDE Zambia starts with training farmers about this subject.

RPI governing structure

Within the RPI project the farmers are organized within farmer groups. According to IDE, farmers who are organized within a group have easier access to credit, banking facilities, markets and the supply chain of agricultural inputs than individual farmers. Within each farmer group a chairman or chairwomen, vice-chairman or vice-chairwomen, secretary and treasurer are appointed by its members. In most cases the chairman or chairwomen of a farmer group fulfils also the role of contact farmer of IDE Zambia. This farmer is contacted by IDE when IDE wants to arrange a meeting with all the farmers of a farmer group or IDE wants to inform farmers about a topic.

Within each project area of IDE Zambia about twenty farmer groups are involved in the RPI project. These farmer groups differ a lot from each other in size and functioning. Most farmer groups existed already when IDE started it's recent project, due to former development projects of IDE, the Zambian government or other NGOs. Some farmer groups were however solely set up with the purpose to join IDE's RPI program. The number of farmer groups joining the RPI program is still growing.

At the moment farmer groups are trained separately on the issues named above. Because in most project areas only two IDE field officers are stationed, the trainings on the different program subjects and the ancillary meetings are at the moment too time-consuming for the IDE field staff. IDE Zambia tries to relief the working pressure of their field officers by creating zone committees, which can be trained instead of farmer groups. These zone committees consist of the representatives from three to five farmer groups in a certain area. Within each zone committee, members are appointed to fulfill a task within one of the three study groups: Credit and Market, Irrigation and Inputs, Capacity Building and Gender. Instead of farmer groups being trained by IDE field officers, in the future the zone committees or one of the study groups of the zone committees will be trained. The different representatives within the zone committees will then train the farmers of their own farmer group about the subject they have learned about from IDE. Farmer groups with many members will probably even be subdivided in sections. Figure 4.1 shows the new RPI governing structure.

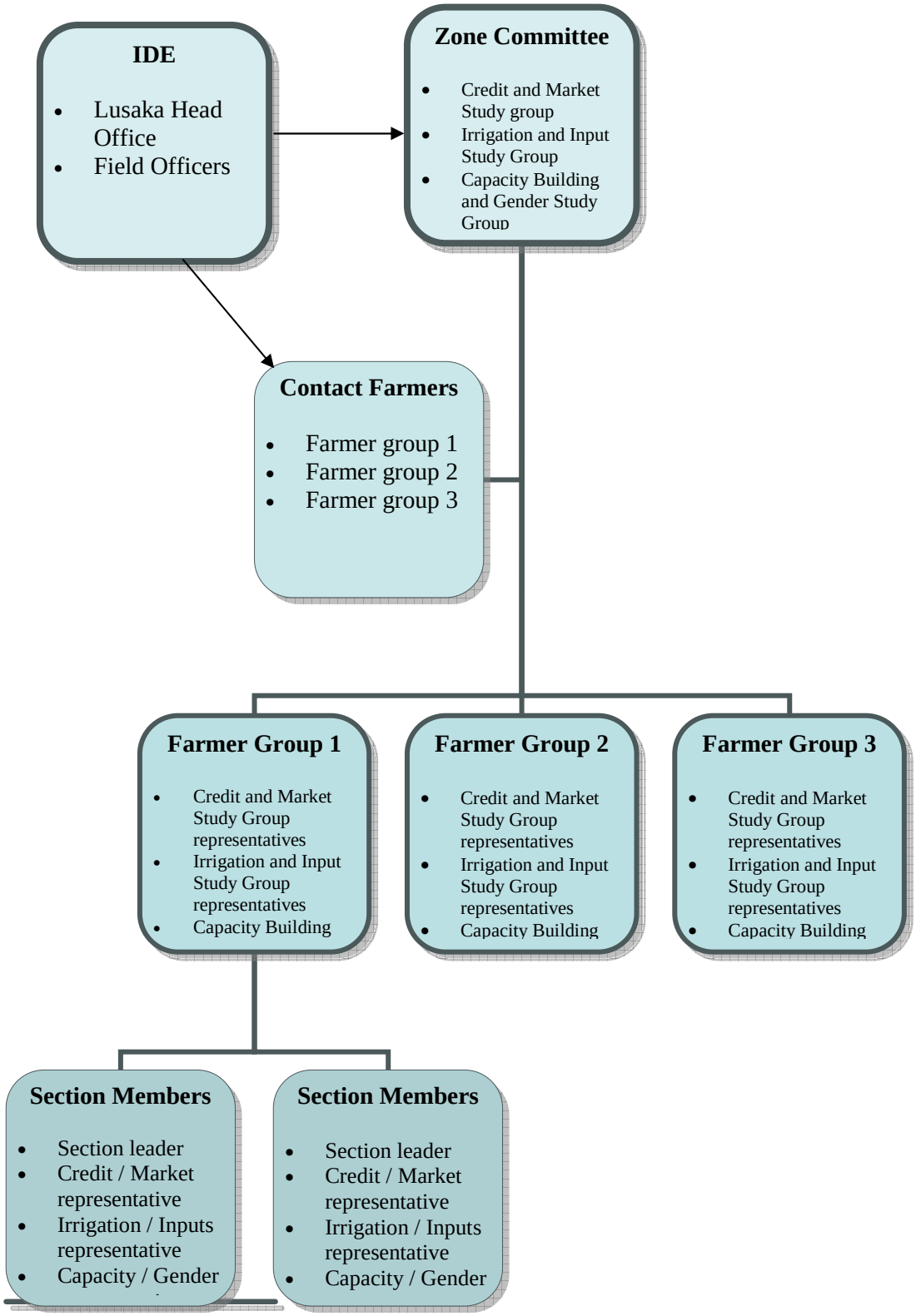

Figure 4.1 New RPI governing structure. Source: IDE staff Lusaka, Kabwe and Kafue

Distribution of treadle pumps
Over the past 10 years, IDE has been involved in the distribution of about 7000 pumps in Zambia. Theoretically, within the RPI project, the distribution of the treadle pumps should have taken place through a distribution network consisting of manufacturers, retailers, NGOs, private partners and customers (farmers). However IDE encountered some problems while introducing a supply chain for treadle pumps in Zambia. There are for example not enough manufacturers to supply farmers with a treadle pump. At the moment pumps are imported from Kenya and India. The types from Kenya and India are slightly different. The pump from Kenya is more expensive than the pump from India, but is easier to operate and has a longer lifespan. Because most of the pumps are imported, they are more expensive than the pumps sold in Asia. Next to the fact there are to less manufactures of pumps in Zambia, many retailers do not have the capital or the access to credit to work directly with manufacturers. IDE therefore decided to undertake the distribution role as long as necessary. For the poorest smallholders access to a treadle pump is difficult, because of its relative high price. A treadle pump with inlet and outlet pipes in Zambia costs between the 100 and 156 American dollars. For a family living below the $1 or $2 a day, this sum is almost impossible to pay. (Kay and Brabben, 2000) (Hiller, 2007) This is why in most project areas of IDE still a lot of small-scale farmers are irrigating with buckets or watering cans.

Figure 4.2 A farmer irrigating his crops, in a village close to Kafue. (Famke Ingen-Housz)

4.2 IDE's approach and strategy

As stated earlier, the aim of IDE is ending poverty by increasing incomes from small-plot agriculture (IDE, 2006). Ending poverty by focussing on Third World small-scale farmers is important according to IDE, because at least seventy percent of the poor (earning less than $1 a day) live in rural areas of developing countries and derive their primary livelihood from agriculture (Polak and Yoder, 2006). A major contribution to ending poverty can thus be delivered, when these people succeed to increase their income from agriculture.

According to IDE to move out of poverty some changes should be made in smallholder agriculture. Most important is a change from a single-minded focus on subsistence crops to a new focus on producing labour-intensive, high-value, irrigated crops like fruits and vegetables, which then can be sold on the market (Polak and Yoder, 2006). With growing cash crops, especially during the dry season, small farmers can according to IDE take advantage of their low labour cost and can therefore be competitive on the market (Magistro et al., 2007).

Growing cash crops and bringing these crops to the market is however not easy for Zambian small-scale farmers. As written in chapter two Zambian smallholders face many constraints to expand their production with cash crops. To expand their production farmers need at least a better access to inputs, credit and new intensive agricultural methods customised for small plots and a better access to output suppliers and sustainable markets for the high-value crops they produce. As can be concluded from the description of the RPI project above, IDE tries to nullify almost all of these constraints which smallholders encounter when they try to produce cash crops for the market. In Zambia IDE attempts to link farmer groups with input suppliers, output suppliers, micro credit and affordable, small-scale and easy to maintain irrigation techniques, as the treadle pump.

The approach underlying the RPI project and its goal to increase the income of 14 000 Zambian smallholders, is called the 'Poverty Reduction through Irrigation and Smallholder markets' approach or PRISM approach. The PRISM approach is developed by IDE and is a market-based approach. Although IDE admits market forces only are not enough to end poverty of rural households and often subsidies or help from for example development aid organisations is needed to lift most of the constraints smallholders face, they emphasize it is the demand for cash crops that will, in the end, stimulate production and increase farmers' incomes (Magistro et al., 2007).

4.3 IDE and their ideas about gender

The RPI project in Zambia is partly sponsored by the Bill and Melinda Gates foundation. As most donor organisations, the Gates foundation provides gender guidelines for its grantees. As written in the description of IDE's RPI project, IDE has included a capacity building and gender program in its project. During my period of field research in Zambia, IDE Zambia was seeking for ways to address gender issues in its program and was using the gender list of the Gates foundation as guideline. Within its guidelines the Gates foundation asks its grantees to consider the different roles of women and men while designing and implementing their project, to consider the effect the project has on both men and women and to make an effort within their project to enhance the status and possibilities of women. According to the Gates foundation the inclusion of women in development projects is crucial. Within their guidelines they state: "...it is our belief that to achieve dramatic and sustainable change our initiatives must offer innovative approaches to development challenges that engage, empower and invest in women. As women comprise the majority of smallholders in sub-Saharan Africa and South Asia, consideration of their needs at every level is integral to achieving the greatest impact" (Bill and Melinda Gates foundation, 2008). The guidelines of the Gates foundation are based on the idea that gender inequalities slow economic growth and thus that the participation of women is essential to a productive economy. In the words of the Gates foundation: "…this highlights the importance of addressing gender not only to correct inequity but also as a means to create more effective development." (Bill and Melinda Gates Foundation, 2008).

Because of the major attention which is directed towards gender in the development arena, as many development organisations, IDE had probably no choice but to address gender in their project as well. Often donor organisations ask their grantees to pay attention to gender issues in their projects. It is therefore the question to what extent the inclusion of gender in its program was a free choice for IDE and IDE Zambia. Considering the idea why gender should be addressed in development projects, IDE seems to follow the line of thought of the Gates foundation. During my

field research in Zambia I got the impression that IDE believes addressing gender issues will in the end enhance the production of small-scale farmers. Considering the wider context of gender and development, it could be concluded the Gates foundation and thus IDE as well are formally following the ideas of the third WID approach or efficiency approach. As described in chapter three the efficiency approach emphasises that increasing women's economic contribution will increase overall economic efficiency and it assumes, just as the Gates foundation and IDE, that this increased economic participation of Third World women is automatically linked with increased equity.

Although IDE states it is important to include gender in their projects, little is said about gender in their written documents and papers. While reading through IDE's project proposal for the Bill and Melinda Gates Foundation (IDE, 2006) and literature on which IDE's project approach is based (Magistro et al., 2007) (Polak and Yoder, 2006) (Polak, 2005), it is remarkable all documents are written in a gender 'neutral' way. The documents speak of 'farmers' or 'smallholders', but there is no distinction made between men or women. IDE seems to base its RPI program on the assumption that farmers are individual entrepreneurs. Core of the program is helping the individual farmer with increasing his or her income by producing cash crops and selling these crops on the market. Although IDE states in its project proposal (IDE, 2006) the outcomes of the program will be positive for all individuals who join the program, including their families, no attention is paid *how* the program will be beneficial for the different members living in the same household. As stated in chapter 3 understanding the dynamics within a household is important for making sure the introduction of technology is positive for all members of a household. In African rural communities and households, people have often different roles, different tasks and different needs, but are in performing these tasks and activities dependent of one another. In most African countries a small-scale farm can be characterised as semi-autonomous *and* overlapping units of production and consumption. Nevertheless, IDE seems to think of farming as a business of individuals, rather than of a household-based collectivity.

During my period of field research IDE Zambia was seeking how to address gender issues in their RPI program. Gender is however not part of the core of IDE's RPI project. Within the literature on which IDE's project approach in Zambia is based (Magistro et al., 2007) (Polak and Yoder, 2006) (Polak, 2005), gender is not considered as one major structuring variable in transforming the RPI program inputs into outputs and benefits. Although the other programs, the linkage to markets, credit, input suppliers and irrigation techniques, have a well-defined link with the aim of IDE to increase smallholders income, gender has not. IDE Zambia's new gender program is primarily focussed on training farmers about gender issues in order to raise gender awareness among the registered smallholders. Also, IDE Zambia obliges farmer groups who want to join the RPI program to have at least several women as member. Why raising gender awareness among farmers and the participation of women is important to achieve IDE's project goal in Zambia, remains however unclear in their project documents.

While seeking how to address gender issues in their RPI program, IDE Zambia seems not to consider its own role and influence on gender issues. Gender is mainly seen as a technical and unambiguous concept, which can be taught just as the use of chemicals or treadle pump maintenance. The fact development programs can have a different impact on men and women and the fact the project approach in a development project defines how both men and women are affected, is not reflected on by IDE Zambia. For example, as described in the text above, the core of the RPI project is increasing smallholders income by growing cash crops and selling these cash crops on the market. As will be explained in the next chapter, this marked-based approach automatically draws the attention of IDE Zambia to the farming activities of men. Off course nothing is wrong with helping specifically men to become more effective market participants, but IDE Zambia seems not aware of the effect their choices have on both men and women.

Since the new gender program within IDE's RPI project is focussed on teaching farmers about gender issues, the employees of IDE Zambia are put in the role of gender expert. As explained above, within the project approach of IDE gender and its implications for the outcomes of a development project are not well defined. It is not clear why gender should be addressed in order to reach the project goal of increasing smallholders income. This lack of direction, makes for most employees the often sudden role of gender expert not a comfortable one. At the IDE office in Lusaka, the head office of Zambia, for most employees gender remains a vague and confusing concept. I got the impression most employees on the IDE office in Lusaka struggle with the question how gender must be integrated in their projects and trainings.

For the field officers of Kabwe and Kafue (and Lusaka) gender seemed to be a less vague and confusing concept then for their colleagues at the head office in Lusaka. Gender is just something they have to deal with every day. The culturally defined roles and tasks of men and women are a daily part of their work. They were well aware of the existing interdependencies and social relations between people in households and communities. The field officers in Kafue and especially Kabwe did not only approach the head of the household, which were mostly men, but also women in male headed households, in order to support the farming activities women conducted on their individual plots. As I will describe in the next chapter, some women have their own fields on which they grow mainly crops for home consumption.

Although the field officers in both Kabwe as Kafue had often more clear ideas about the different roles of men and women in rural households and the effect of the RPI project on both male and female farmers, this was often not communicated towards the head office in Lusaka. On the other hand IDE employees at the head office in Lusaka, did not ask their colleagues in the field about gender issues when things were unclear. Therefore in some cases, field officers could be well aware what was happening in the field, while the head office in Lusaka had no idea.

4.4 Conclusion

In Zambia, the RPI project of IDE is clearly based on a market-oriented approach. IDE's target group, the small-scale farmers, are seen as entrepreneurs and helped to become even better and more effective market participants by stimulating them to grow cash crops. IDE is quite ambitious in achieving its goal to increase income from small plot agriculture. Not only IDE tries to nullify most of the constraints smallholders face to increase their production and income, IDE also has the ambitious aim to help about 14 000 Zambian rural families to increase their income from agriculture.

IDE has extensively developed ideas on how to help smallholders to overcome many of their key constraints to market access, access to inputs and affordable small-scale irrigation techniques. However, how gender should be addressed in their projects remains vague in their official documents and statements. On the one hand IDE, conform with its market-based approach, underscores the importance of the inclusion of women for the economic effectiveness of its RPI project. On the other hand IDE does not address gender directly in its project proposal for the Gates foundation and other documents which inform its project approach in for example Zambia. IDE seems to base its RPI program on the assumption that farmers are individual entrepreneurs and seems to think of farming as a business of individuals. Core of the program is helping the individual farmer with increasing his or her income by producing cash crops and selling these cash crops on the market. IDE makes no distinction between men and women. Because of this liberal and individualistic approach of helping small-scale farmers, IDE pays no attention to the interdependencies and social relations between people living in households and communities and does not consider gender as an important structuring variable in transforming the RPI inputs into outputs and benefits. However, as stated in chapter 3 understanding the dynamics within a household and community is important for making sure the introduction of technology is positive for

all members of a household. Only then, according to most feminist researchers, approaches and interventions for introducing technology can be developed which have the biggest chance for success.

In the next chapter I will discuss how IDE's project approach and ideas about gender work out on field level. In the conclusions the assumptions of IDE considering gender will be checked against reality.

5. Case study: The introduction of the treadle pump in Kabwe and Kafue

In this chapter I analyse the data of my field research in the Zambian project areas of IDE, Kabwe and Kafue. The observations in the field, interviews and talks with farmers and IDE staff are used to determine which project approach IDE Zambia uses in its RPI program to introduce treadle pumps and how this approach affects the gender relations in Zambian rural households. The results of this analysis will illustrate how IDE's general ideas about gender work out at field level and show more clearly on which gender ideas IDE and IDE Zambia inform their RPI project and the introduction of treadle pumps in Zambia.

5.1 Gender and Household organisation in Kabwe and Kafue

5.1.1 General characteristics of households interviewed

As stated in chapter two, in Kabwe and Kafue most farmers cultivate small plots of land in a labour intensive way and with little use of chemicals, fertilisers and equipment. Next to rain fed fields, where farmers grow mainly maize and groundnuts, farmers are also traditionally involved in gardening. Within these gardens vegetables and fruits are grown, which are during the dry period irrigated with water from a well or nearby stream. Most farmers irrigate their crops with buckets or watering cans. Other irrigation methods, even the treadle pump promoted by IDE, are for the majority of farmers to expensive to purchase. See table 5.1 for used irrigation methods in Kabwe and Kafue.

Most farmers who were interviewed during this research owned less than 5 hectares of land. Farmers living in a polygamous household and farmers living in a household which had a motorised pump at its disposal owned usually a little bit more; between the 5 and 25 hectares of land. For all respondents farming was the main source of income. The majority of these farmers earned their living by growing crops. Some earned extra income with other activities as cattle breeding, fishing, their own tavern, woodworking or a small job for the Zambian government.

Maize, groundnuts and other crops grown on the rain fed fields were mainly produced for home consumption. From the vegetables and fruits grown in the garden usually half of the yield or more was sold on the market. For all interviewed farmers, irrigating with a treadle pump, motorised pump or bucket, selling the produce from the garden was an important way to generate cash. However, as described in chapter two, farmers in Kabwe and Kafue face many constraints to produce crops for the market. For most respondents who were interviewed during this research an important constraint was the difficult access to markets. On average the distance to the nearest market is about 10 to 15 kilometres. In addition, the condition of most roads, especially in the rainy season, is bad. Because most interviewed farmers only had a bike as transport, buying inputs for farming or selling produce could be a huge undertaking.

In Kabwe and Kafue most land the farmers own is customary land. This land is allocated by the village chief. According to customs usually men obtain land via the chief. They may use the land and sell the land's products. The use rights to customary land can be inherited, but can not be sold. The inheritance of land in Kabwe and Kafue is in accordance with the patrilineal system, in which sons inherit from their fathers while women gain their rights to land through their husbands. Women in

rural households can often not keep the land when their husband dies. The male relatives of the husband inherit usually all his land, cattle and even his children. The woman is often left with nothing and has to return back to her own relatives.

Table 5.1 Used irrigation methods in Kafue and Kabwe

Project area Kafue

	IDE farmers	
Irrigation method	Number of registered farmers	Percentage
Bucket	434	72,3%
Engine	83	13,8%
Treadle pump	75	12,5%
Treadle pump and Engine	8	1,3%
Total	600	100,0%

Project Area Kabwe

	IDE farmers	
Irrigation method	Number of registered farmers	Percentage
Bucket	759	80,9%
Treadle pump	70	7,5%
Engine	93	9,9%
Other irrigation methods	16	1,7%
Total	938	100,0%

Source: IDE registration lists Kafue and Kabwe, April 2008.

Because of the traditional law of inheritance and not much male migration, most households in both Kabwe and Kafue are headed by men. Things are however slowly changing. According to national law, women have nowadays the right to keep the land when their husband dies. The more younger village chiefs, who are mostly well-educated and less conservative than the older chiefs, often decide in favor of a widow. Besides, more women are getting their own land through government programs. Indeed, in for example Kabwe, there is a growing number of women who have their own farm or can keep their husband's land after his dead. In Kabwe from the 25% females who were registered with IDE, 9% was head of the household (IDE registration lists Kafue and Kabwe, April 2008).

The interviewed rural families living in the same household mostly consisted of a man, his wife, their children and sometimes relatives, as a sister, brother, nephews or nieces. The majority of the families which I interviewed had young children who were still going to school. Four to five children was average per couple, but because of AIDS a lot of households took care of the orphans of a brother. Within rural families with older children, the children often had moved out or otherwise helped their parents with farming. In some households a married son or daughter who was still living with his or her parents got a own plot to grow crops. Next to monogamous households, in some villages, polygamous households were the norm. Within one of the villages I visited in the project area of Kabwe, depending on a man's wealth, two to four wives living in the same household was quite common. From the sixteen interviewed farmers, two were living in a

polygamous household. The total percentage of polygamous households in Kabwe and Kafue is however unclear.

Within text box 5.1 some households which were interviewed are described in more detail. Although these households have a lot in common, as can be concluded from the text above, the more detailed description shows the interviewed households have a lot of differences as well.

5.1.2 Gender roles in the interviewed rural households

To study the impact of the introduction of the treadle pump on gender relations in IDE's RPI program in Kafue and Kabwe, I needed first some more insight in gender roles in rural households. Therefore, during interviews, I asked farmers who controlled what, who did what and who got what in the household. With the answers of the farmers I could sketch a more general picture of the division of labour and the distribution of benefits within the interviewed rural households.

All interviewed rural households, except of one, had a collective household garden and collective household rain fed fields. According to custom, these fields are owned by the men and the proceeds of the fields are in principle used for the benefit of the entire household. In the collective household fields or main fields men, women and often the elder children work hand in hand and are almost equally involved in all farming tasks. During the interviews women and men said there was some division of tasks, but this division was absolutely not rigid and was dependent on the household labour relations and organization. Farming jobs which are not heavy, but need patience and precision are mostly considered as female jobs. Examples are weeding and planting. Tasks like ploughing, buying inputs on the market, the maintenance of irrigation equipment and the marketing of cash crops were often considered as male jobs. Men perform these tasks because they are regarded as heavy jobs or they require special skills and knowledge, which is assumed only men have. Other tasks like irrigating the field with buckets or a pump, land preparation, harvesting, fertilizer application and the selling of products locally was done by almost all members of the interviewed households. Remarkable was that during the interviews both men and women said irrigation is a 'men thing', although women use irrigation equipment as much as men do and perform the same irrigation tasks, as treadling and diverting the water into the crop basins. Probably irrigation is seen as a 'men thing', because it are usually the men who buy irrigation equipment and who are assumed to be more knowledgeable considering irrigation than their wives.

The crops grown on the main fields and collective household garden were mainly cash crops and usually more than half of the yield was sold on the market of Kafue, Kabwe or Lusaka. The money earned with farming on the main fields was in most households used for buying farming inputs as fertilizer and chemicals and sometimes for farming equipment as irrigation techniques. The income from cash crops was also used for bigger expenditures for the whole family, as school fees and clothes, and spend on luxury goods as a radio or a bicycle. In most families the head of the household, which was usually a man, had the final say about what the money, earned with farming on the main fields, was spend on. Also decisions about what to grow in the garden or what inputs as fertilizer or farming equipment should be bought were made by the household head.

However the fact men have often the final say considering the main fields and the money earned with selling crops from these fields, does not mean other household members have no say at all. In most interviewed households the different members of the family sat together to discuss for what purposes the money should be used. Only when no agreement could be reached the household head was the one who decided. Also with other decisions considering farming on the main field men often consulted their wives.

Text box 5.1 The interviewed households in Kabwe and Kafue and their differences

In the village of Malembeka (Kafue), Timothe Hamwene and his wife Katazo Songa live in a small loam house with their family. On their homestead, chickens, goats and children are running around. Next to Timothe and his wife, three of their sons, a niece, two nephews and two grand daughters live in their household as well. Their eldest son of 19 years old has just finished high school, while the youngest of the family, their granddaughter Charit, did not start with preschool yet. Their homestead is situated in the middle of their fields. They have a garden of ¼ hectare in which they grow egg plant, tomato, rape and sweet potato. On their rain fed fields, which are about 2 hectares, they grow maize, cotton and groundnuts. The vegetables are irrigated with water from a well in the garden. In 2006 they bought a treadle pump from the Zambian Agriculture Ministry. The pump did cost around a 133 euro and was financed by Timothe himself. The pump performed very well in the beginning, but the rubbers in the cylinders are now starting to wear out and pumping water is getting more difficult. Farming is the main source of income. Next to selling most of their vegetables on the market, they also earn some money with their livestock. The whole family is involved in farming. Timothe and his wife perform most farming tasks together, with now and then some help of their elder children.

The household of James Namkupa and Marjanna Njanka is situated in the same village as the Hamwene household, along the main gravel road leading to Kafue town. Their son Big and his wife have their own house on the homestead of James and Marjanna. Big and his wife have three small children, who are all going to preschool. Next to helping with farming, Big has a job with the electricity company Zesco. Also the unmarried daughter of James and Marjanna is living in the household with her baby girl. The garden is ½ a hectare, on which okra, rape, onion, Chinese cabbage and pumpkin is grown. On the rain fed fields, of about 3 hectare, groundnuts, millet and maize are grown. The garden is managed by Marjanna and her children, because her husband has his own tavern and does not have time to work in the garden. They irrigate the vegetables with water from a nearby stream or in the dry season with water from a dug well. Because Marjanna does not have enough money to buy a (treadle) pump, she is using buckets to irrigate her crops, which is a very heavy job. A big part of the vegetables grown in the garden are given to relatives of Marjanna or used for own consumption. The leftovers are sold locally. James and Marjanna have their own rain fed fields. They do assist each other on the fields as family, but both have eventually control over their own part. Also most of the yield of the rain fed fields is used for home consumption or given away by Marjanna to her relatives. The rest of the yield is usually sold locally.

Edwin Mwale and his wife Diana live in a village called Mukumba (Kabwe) where they own a farm of 10 hectares. Next to the farm, they own a shop in Kabwe town. All their children are living somewhere else and are not involved in farming. Edwin Mwale started farming after his retirement with Zambian Airways. Probably to earn money next to his small pension. Edwin Mwale manages the farm together with his younger nephew. His wife manages the shop and is not directly involved in farming. In their garden of 2 hectares they grow at least 15 different vegetables and fruits, as oranges, lemons, watermelons, rape and eggplant. On their rain fed field of 5 hectares maize, beans, groundnuts and popcorn maize is grown. Most of the yield is sold at the market in Kabwe or in their own shop. Edwin Mwale irrigates with the help of a motorized pump or when the motorized pump is down, he is using the treadle pump. When he bought the farm, he started irrigating his vegetables with buckets, but bought in 2005 a treadle pump from a local manufacturer. In the same year he also bought a motorized pump. The whole year round he pays workers, mostly about three men, to help him with the different farming tasks.

Shangwa Simba lives in the village Kalimina with his four wives, 10 children, his grandfather, his mother and his four sisters. The different wives of Shangwa all have their own hut. The main house belongs to his first wife. He owns 25 hectares of land, of which the garden covers an area of 5 hectare and the rain fed fields an area of 20 hectares. Each of Shangwa's wives own their own small garden and rain fed field on which they grow mainly crops for home consumption. On the main fields and in the collective household garden cash crops are grown. Shangwa Simba is irrigating his vegetables in the garden with water from a nearby river with the help of a motorized pump. His father was already irrigating with a motorized pump when he was head of the household. Shangwa's wives and sisters assist him on the collective household fields. Sometimes he assists his wives on their fields.

In addition to the collective household fields, women in polygamous households and some women in monogamous households (one third of the interviewed monogamous households) have their own individually controlled plots in the garden or rain fed field or both. On these plots women grow crops which are used for home consumption. Because women often have no money to buy fertilizer or chemicals themselves, they depend on their husband for buying farming inputs. To be less dependent of their husband, women produce crops which are easy to grow and need less fertilizer or chemicals than most cash crops. An other important reason for women to grow 'easy' and less labour intensive crops is their lack of time. Examples of these 'easy' women crops are groundnuts, maize, sweet potato, pumpkin and rape. Only the surplus of their plots is sold and therefore women do often not earn a lot of money with their own produce. The money they earn is however *their* money and can be spend without asking their husband's permission. Most women use their income for personal things as clothes, nail polish and wigs, but also buy extra tools for the kitchen or some extra food to cook. The interviewed women indicated that an individually controlled plot was important for them, because they could give friends and relatives vegetables or other crops without asking their husband's consent. Most men did not share their benefits with others and some men noted it was because of the desire of their women to share food or money with their relatives and friends to demarcate land for their wives in trying to prevent their crops to be shared with the family of their wives. The act of sharing food with friends and especially relatives is probably for women an important way to maintain a good relationship with her kin and be assured of their help and care when she needs it. Women worked only on their plots when all the work on the main field was done. Except from supplying some fertilizer or chemicals, most husbands did not help on the plots of their wives. Some women were assisted with farming by their elder children or their female kin, as sisters.

Text box 5.2 A day schedule of interviewed women and men farmers in Kabwe and Kafue

Vergina Mwinga, 23, wife of Blande Mwinga:

05.00 h	- Get up
	- Swept yard
	- Getting water for washing faces
	- Breakfast
	- Swept house
	- Harvesting maize with husband
	- Preparing lunch – husband remained to pack maize
	- Weeding and irrigating garden with husband
	- Water fetching
	- Husband bathed children
	- Preparing supper
20.00 h	- Sleeping

Frieda Mwanga, 41, wife of John Malama:

05.00 h	- Get up
	- Preparing breakfast
	- Fetching water
	- Swept the house
	- Harvesting maize with man
	- Cooking lunch
	- Watering the garden
	- Fetching water
	- Preparing the relishes
	- Cooking
20.00 h	- Sleeping

Peter Ngulube, 47, husband of Esta:

06.45 h	- Get up
	- Maize shelling with wife
	- Lunch
	- An hour rest
	- Harvesting rape in garden with wife
	- Bathing
	- Supper
20.00 h	- Sleeping

Dominic Mwanza, 23, husband of Extuda:

05.00 h	- Get up
	- Weeding in the garden with brother
	- Irrigating the garden with brother
	- Resting
	- Lunch
	- Playing a soccer match in village
	- Dinner
20.00 h	- Sleeping

Next to farming, for all the interviewed women reproductive tasks formed a major component of their daily workload. Their reproductive tasks comprised childbearing and childrearing plus domestic tasks as cooking, gathering fuel wood and water, processing food and washing clothes. Most domestic tasks take a lot of time. Preparing for example food and cooking supper is often 1 ½ or 2 hours work. As in most African societies, the men in the interviewed households did not have clearly defined reproductive roles. With the exception of a few, most men did not bother about doing any domestic tasks. Being responsible for domestic tasks, childrearing and farming on the main field and sometimes their own plots as well, women in the interviewed households had often more work to do than men and less time to rest. In text box 5.2 a day schedule of four interviewed farmers, both men and women, is showed.

Although men in Kafue and Kabwe have no clear defined reproductive role, this does not necessarily mean men are doing nothing while their wives are busy with household activities. For example, while Vergina Mwinga (see text box 5.2) is preparing lunch, her husband remains on the main fields to pack maize. As stated in chapter 3 and 4 in African rural communities and households people have often different roles, tasks and responsibilities, but are in performing these tasks dependent of one another. The answers of the farmers who I interviewed show as well that running a household is a collective business.

In addition to their productive and reproductive roles, women and men in African societies play a community managing role as well, which is for men and women often different. As explained in chapter 3, for women the neighbourhood is an extension of the domestic arena, while for men it is the public world of politics. Also in the villages in Kabwe and Kafue the public arena seems to be male and the domestic arena female. According to women and men I interviewed, meetings and public gatherings were traditionally not a place for women, but only for men. It is for example considered rude if a woman argues with a man in a public meeting.

The position of women in the interviewed households could differ a lot. Their position in the family and their bargaining power in decisions about farming or household matters was not only influenced by the fact they were women, but also by other factors as their education level, ethnicity or age. In some marriages you could tell the head of the household and his wife could get along very well and therefore most decisions were made together. In other households the women I interviewed barely dared to speak when their husband was around. Polygamous households were, considering the roles of husband and wife, often more traditional than monogamous households, but had also a greater separation between the incomes of men and women. During the interviews I noted that gender awareness and assertiveness among women often went hand in hand with a higher education level (secondary or more). In text box 5.3 a little bit more is told about women living in a polygamous household. In text box 5.4 an example of two higher educated women and their position in the household is given.

Text box 5.3 Women in polygamous households

A female field officer in Kabwe told me the following about women in polygamous households: 'In most polygamous households the different wives are relatives of each other. Being relatives makes living together in a household with only one husband and multiple women more easy. In polygamous households all women like to contribute their labour equally to the household's main fields. When one women discovers she is contributing more labour than the other women she either boycotts contributing her labour or demands more income benefits from her husband. To avoid this men in polygamous households try to allocate activities equally among their wives. Often they make a schedule together about who is doing what and when. Most women in polygamous households have their own hut and sometimes cook for their children separately from one another. Millet meal (maize mail) is often jointly used among the women, but they take care of their own relishes, which are often made from vegetables grown on their own individual plots.'

Text box 5.4 Anita Mweemba and Eva Chaala

Anita Mweemba is married with George Mweemba and is living with her three children and niece in the village Kabweze (Kafue). Her husband George has a part-time job with the Zambian ministry of Agriculture. In contrast with most other women, Anita went to high school and is able to speak English. She farms together with her husband, but as she said during the interview she has often the final say about what to spend the money on when disagreement arises. Anita is chair women of the IDE farming group in Kabweze. This is however not her only job. She is the contact farmer of the women in Kabweze for a micro-credit program of Micro Bankers Trust as well. During one of my visits she was chairing a meeting of the IDE farmer group. Anita was doing most of the talking and did not seem to hesitate in taking the lead of the conversation.

Eva Chaala got some years ago a plot of 2 ha of the Zambian government. At the moment she is farming with the help of her elder son, who is living with his wife on the homestead of Eva. She just bought a motorized pump to irrigate her vegetables in the garden more easily. Both her garden and rain fed fields were the most organized and neat of the village. During a meeting of the IDE farmer group, Eva seemed not to hesitate to argue with the men which chemicals were best to apply for certain crop diseases. Eva was trained about gender by the Zambian government and worked for a while as an governmental extension officer concerning gender. During the interview she said that tradition is strong in Zambia and that even for her it is hard to change the mindset of her own children considering gender and equal rights for women.

In spite of the differences between the interviewed female and male farmers, for all of them, marriage and having children were valued as very important. First of all, probably, because the rural societies in Kabwe and Kafue were strongly pro-natalist. Children are valued for economic and social reasons. A women's role as mother largely defines her identity in the village society. Infertility is viewed by society at large and by infertile women themselves as a personal failure and is often grounds for divorce. Through giving birth, women achieve social acceptance. Therefore the domestic tasks of women, meeting the needs of children and other household members, is by the society at large and women themselves considered as important and *their* task. (Bryceson, 1995) Secondly marriage and getting children is probably important for both men and women because according to custom a man with a family can claim individual land from his parents or from the community and it provides women with security and safety. In Kabwe and Kafue, through marriage, women have access to land and in many cultures, as is in Zambia, women as wives have the right to rely on husbands for support, provision and protection (Jackson, 2007). Although marriage is by some feminists and donor organisations seen as a site of gender subordination, marriage can according to Jackson (2007) also be seen as a set of (variably conditional) entitlements of value to women and not only as a relationship of power and inequality which disadvantages them. Indeed in Kabwe and Kafue, none of the women I interviewed complained about marriage. Sometimes they complained about their husband drinking to much or being lazy but marriage itself was not seen as something bad.

From the interviews and the text above can be concluded that men and women living in the same household are dependent of one another and that all the activities taking place within a rural household, as for example farming, can not be considered as a concern of simply individuals. The notion of a marriage as a conjugal contract from Ann Whitehead involves the interdependencies between men and women in marriage: "Ann Whitehead's notion of the conjugal contract (Whitehead, 1981), which points to the culturally specific implicit understandings of the exchanges between women and men in marriage as the basis for what are considered to be legitimate claims and expectations of partners. Such norms are not unchanging but constitute the discursive

resources which women and men draw upon in justifying individual negotiating positions." (Jackson, 2002:498-499). In contrast with IDE's notion of farming as a business of individuals, it can be concluded that farming in Kafue and Kabwe entails more. Farming is rather a collective business in which all household members are involved and the roles of men and women are interdependent.

5.2 The introduction of treadle pumps and its effect on gender relations in Zambian rural households

5.2.1 The general impacts of the adoption of treadle pumps

As described earlier, IDE focuses on the development and introduction of efficient small plot water technologies that are affordable for the rural poor. Within most of its projects the treadle pump is the most important small plot water technology promoted by IDE. Small-scale farmers in Zambia have a tradition of growing vegetables and fruits in so-called gardens. During the dry season they irrigate their vegetables and fruits with water from a dug well or nearby stream. This is usually done with buckets or watering cans, because other irrigation techniques, such as a motorized pump, are usually to expensive for these small farmers. Irrigating with buckets or watering cans is however a very heavy, slow and labour intensive job. Farmers are often not able to apply enough water on their fields and therefore the crops grown in their gardens frequently suffer from water shortage. IDE thinks the treadle pump is a good and affordable alternative to irrigation with buckets or watering cans and can be seen as a first step towards irrigation with a motorised pump. Because with a treadle pump much more water per second can be applied on a certain area, IDE beliefs that farmers who use the pump can increase their production and finally increase their income as well.

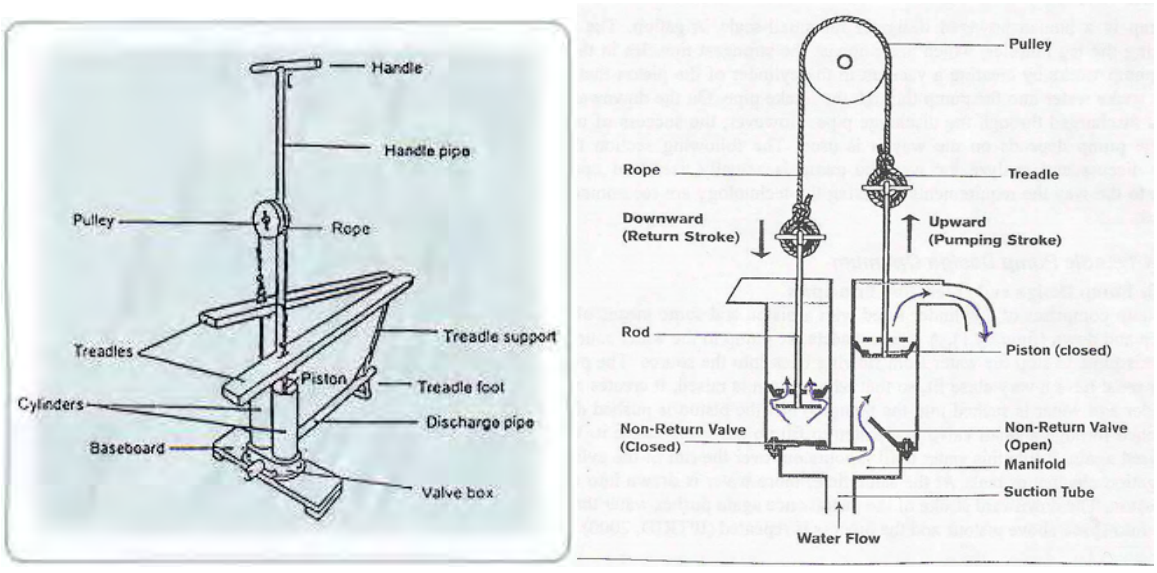

Figure 5.1 The treadle pump and its operating principles

The principle of a treadle pump is based on suction lift using a cylinder and piston to draw water from a source below ground level, for example a river or shallow aquifer. The treadle pump was originally developed as hand pump for domestic water pumping. It has been adapted for use in

irrigation, where much greater volumes of water are needed, by changing the driving power from arms and hands to feet and legs. Two pistons are used, each connected to a treadle. The user stands on the treadles, pressing the pistons up and down in a rhythmic motion. Instead of bucket-lifting technologies of which water lifting rates are at best 0.5-1.0 m3 per hour, the treadle pump can lift 2.5-5 m3 of water per hour. Ideally, it should be possible to lift water by suction up to 10 m. In practice, a sensible limit is 7 m, because of friction losses in the suction pipe and the effort to create a vacuum in the pipe. (Kay and Brabben, 2000) At the fields of most small farmers in Kafue and Kabwe groundwater was already found at a depth of 4 or 5 m. However at the end of the dry season, for some farmers, the suction limit of the treadle pump of 7 m proved not to be deep enough. At these places groundwater was found deeper than 7 m.

The interviewed farmers who were at first irrigating with buckets, but now owned a treadle pump, named several benefits of using a treadle pump instead of buckets. The most important mentioned benefit is that less labour hours per person are needed to irrigate the same area, compared to bucket irrigation. Although for treadle pump irrigation at least two to three people are needed, one for treadling, one for carrying the hosepipe and one for diverting the water, the total hours of labour to irrigate the garden reduced as well. Most farmers said bucket irrigation needed at least as many people as with treadle pump irrigation to be able to irrigate the garden efficient. Irrigating the same plot with buckets, with the same number of people as with treadle pump irrigation, took according to the interviewed farmers twice or three times as long than with a treadle pump.

Because irrigating the garden with a treadle pump takes less time than with buckets, most interviewed farmers could expand the area of their garden and sometimes the area of their rain fed fields as well. Before starting to irrigate with a treadle pump, most farmers owned a garden of ½ a hectare. When the pump was bought, within one year, almost all farmers expanded their garden to an area of 1 hectare. This is possible because generally smallholders in Zambia own more land than they can cultivate.

Next to the above mentioned benefits, farmers also named as benefit that with a treadle pump the garden could be irrigated fully. While with bucket irrigation smallholders were often not able to apply sufficient water to their vegetables, with a treadle pump this proved to be no problem at all. One farmer told during his interview that in the first irrigation year with his treadle pump, he applied a too large quantity of water. He was not aware of the fact he could give his vegetables too much water as well, and in the end all his tomato plants died. However for most interviewed farmers irrigating with a treadle pump meant an improved quality of their crops and often farmers were able to grow more crops per hectare as well.

The fact more crops, from generally a better quality, can be grown in farmer's gardens with the help of treadle pump irrigation does not necessarily mean the income of a household will increase. The grown crops must be sold on the market as well. According to IDE, farmers are on average able to generate more than $100 extra income annually by using the treadle pump (IDE, 2007). Hiller (2007) even shows that the annual income of a Zambian rural household using a treadle pump increases with $250 per year. Indeed, all interviewed farmers owning a treadle pump said they were on average able to increase their income within a range of $200 - $300 per year. However the Rolling Baseline Survey Zambia 2007 of LEI states that although all income indicators show an increase in income between 2006 and 2007, the increase of income is not significant. This means that although on average the income has increased it can not be stated that households increased their income on average as the difference between households is too large e.g. negative and positive growth (LEI, 2007).

Most interviewed farmers were enthusiastic about the performance of the treadle pump and its benefits and could not name any big disadvantages of treadle pump irrigation. Some mentioned the treadle pump was too heavy for elder people, but then for bucket irrigation the same applied. Farmers who where not owning a treadle pump and were still irrigating with buckets all said they

would like a treadle pump as well. For most farmers registered with IDE the price of the pump is however too high. For smallholders living below the $2 a day, a sum of $100 to $150 (the price of a treadle pump) is often impossible to pay.

5.2.2 The general impact of the adoption of treadle pumps on gender roles

As explained in chapter 3, according to the described intra-household models new technologies have often different effects for the different members of a household. This means the above mentioned general impacts of treadle pump irrigation, which are mainly positive according to the interviewed farmers, can be different for the members living in the same household. Specifically for women, some general benefits for the household, do not necessarily have to be a benefit for them as well. From the interviews and observations in the field the following things considering gender roles and tasks and the introduction of the treadle pump can be concluded.

The division of farming tasks between men and women remained the same when a household switched from bucket irrigation to treadle pump irrigation. As stated before women and men are equally involved in farming on the main fields. Also in irrigation both men and women perform the same tasks and often irrigate the collective garden together. It does not seem to matter if this irrigation is with a bucket or a pump. The division of other farming tasks on the main field as fertiliser application, weeding, harvesting and so on remained the same as well. The only thing which changed in the division of tasks when a treadle pump was used, is that most women are not involved in repairing the pump when it is broken. This is according to both men and women a job for men.

Because women perform the same productive tasks with both bucket and treadle pump irrigation, watering the crops with a treadle pump takes less of their available time than watering crops with buckets. Just as the other members of the household, even when fields are expanded, women spend less time irrigating. Because of the increase in production, in some households more time is needed for selling the produce on the market. The marketing of cash crops is traditionally a job for men. Women are nevertheless often involved in selling crops locally or on the market of Kafue or Kabwe as well. The work load of selling the extra amount of crops is in most households equally shared between men and women. Overall, the introduction of the treadle pump does not seem to enlarge the productive work load of women or men.

The treadle pump and other new low-cost irrigation options are most often operated by both men and women on the collective household fields. These are the fields which are used to grow cash crops for the market. As explained above these collective household fields are owned by mainly men and the proceeds are in principle used for the benefit of the entire household. Thus, the extra income from treadle pump irrigation originates from a higher production of crops on the main fields. This means the extra available money is spend on farming inputs, basic needs of the family, school fees, cloths and luxury goods and when there is disagreement about how to spend the household money, men have the final say in most households.

The introduction of the treadle pump in a rural household does often contribute to the welfare of the household as a whole, but does not necessarily directly lead to extra income controlled by women. Even women with own plots could often not directly benefit from a newly bought treadle pump. As explained in this chapter, women mainly work alone on their individual plots. Sometimes they receive some help from elder children or female kin. However mobilizing labour for farming on their individual plot is for women much more difficult than it is for men on the main fields. Because for irrigation with a treadle pump at least two to three people are needed, for most women bucket irrigation proved to be more practical. Even when a treadle pump was available in the household.

The lack of labour is not the only reason women are not using treadle pumps, even when one is available in the household. Most women had very small plots and the hassle of bringing the treadle pump to their own plot was sometimes not worth the effort. However, it could be that in some households with a treadle pump women have more time available to spend on their individual plots and thus indirectly benefit from the purchase of a pump.

5.2.3 The introduction of the treadle pump and the fulfilment of practical and strategic gender needs

As stated in the chapter 3, while studying the effect of the introduction of treadle pumps on the gender relations within a household, not only understanding the effect of introducing treadle pumps on the different roles and tasks of men and women is important, but understanding the impact of the introduction of treadle pumps on their different needs is important as well. In the text below a distinction is made between practical and strategic gender needs.

Fulfilment of practical needs
As explained in chapter three practical needs improve the condition of women's and men's lives, are felt by most family members and are linked to the material quality of life. Examples of practical needs are the physical condition of work or income level. From the results presented above can be concluded, that considering the fulfilment of practical needs, the introduction of the treadle pump has on average a positive effect on both men and women living in households who could purchase a pump. Since:

- The income from the main fields, specifically from the collective household garden, increased when a treadle pump was purchased and used. The extra proceeds from the main fields are in principle used for the benefit of the entire household.
- For all household members applied that less labour was required for irrigating the garden when the treadle pump was purchased.
- Finally the physical work condition of irrigating crops improved. Treadle pump irrigation was by most interviewed farmers considered less heavy than bucket irrigation.

As all household members, women profit from the introduction of the treadle pump. With the extra earned income from the main fields, the material quality of life of the entire household is improved and thus the material quality of women's lives living in households with a treadle pump is often improved as well. However as stated before, women cannot mobilize labour as easily as their husbands, therefore it is often difficult for them to make use of the new irrigation possibilities on their own plots and increase their individual income.

Fulfilment of strategic needs
Strategic needs improve the status of women and men, are more often felt by women and are linked to the quality of social relations and the ideological. Examples of strategic needs are education, participation or control over income. Meeting the strategic needs of women most often involves achieving greater equality for women. The introduction of the treadle pump is a project element of the larger RPI program of IDE and IDE Zambia. The question arises if the strategic needs of women are taken into account in the RPI program. Do women have equal chances as men to participate and learn in IDE's RPI project?

From my observations of farmer meetings and trainings facilitated by IDE several things, considering the participation of women, can be concluded:

- The attendance of women of trainings or farmer meetings was quite low. As well as in Kabwe as in Kafue 25% of the registered members is female (IDE registration lists Kafue and Kabwe, April 2008). However on most trainings only 10% was female.

- The trainings and farmer meetings were dominated by men. Men were far more talkative than women and most leading positions of farmer groups were fulfilled by men.
- Women had more difficulty with following certain topics. Especially more technical topics, as irrigation equipment or the use of chemicals.
- Because most women were not actively involved in trainings or farmer meetings, the attention of most field officers was during trainings directed towards men.

The fact not many women are present at the trainings and meetings from IDE's RPI program, can be explained with several constraints women face to actually attend the trainings. First of all, most women are faced with a lack of transport. Men usually own a bike and are the main users of this bike. Women have thus to ask their husband if they can borrow the bike. In addition, a lot of women can not cycle. Although the field officers in both Kabwe as Kafue try to organise meetings and trainings as close as possible to the villages where farmers live, this is not always achievable. Certainly not when farmers from different farmer groups have to meet. When a meeting or training is far from the place where a woman lives, it is often more difficult for her than for her husband to get there. Secondly, as described in this chapter, women have a busier working schedule than men. Mainly because they are responsible for the domestic tasks and men are not. Therefore, women do not always have the time to go to a meeting or training. Thirdly, an other important constraint for women to attend the meetings of IDE, is the traditional division of tasks. As explained in this chapter, the domestic arena is female while the public arena, like meetings, is male. In addition, irrigation and the growing of cash crops in general is by both men and women considered as a 'men thing' or masculine task.

If women did attend the trainings they often had a passive attitude and did not always seem to follow the topics of the trainings. This can probably be explained with the fact most women have a lower education level considering farming than men, but can also be explained with the traditional division of roles. Because the public arena is male and it is not polite for women to give their opinion in public, women are not used and do not feel confident do speak out during meetings.

Figure 5.2 A farmer meeting in Kafue and Kabwe

In conclusion, at the trainings and meetings of IDE's RPI program only a small number of women do attend the trainings and if they do attend the trainings there role is often passive and it is not clear if the level of training is adequate for them. This can lead to a knowledge gap between men and women. When IDE Zambia for example promotes the treadle pump during one of its trainings, most women are not present. Women have to rely on their husbands passing on the information to them, which in some households can be a vulnerable position for women.

What women and men want

The risk of analysing the effect of the introduction of treadle pumps on women's and men's needs with as concept practical and strategic needs, is using to much of your own 'western' ideas and assumptions about how men and women should interact with each other. Therefore, during my interviews, I asked men and women what they thought were important gender issues for IDE to address.

During the interviews the women, who did usually not attend the trainings of IDE Zambia, expressed the desire to attend these meetings just as their husband did. They explained that because of the traditional division of tasks, they were not able to go to the farmer group gatherings. As one of the interviewed women declared: 'In our village women have their tasks within the household and family. Men have their tasks outside the house.'

The interviewed women who *did* attend the meetings and trainings of IDE Zambia said they would like to see some more women on leading positions in the farmer group. However they also expressed the difficulty of getting more women on these positions. One of the interviewed women told the following: 'We would like to see a female chairperson. However when we vote about who will be the chairperson for the coming year, even most women vote for a man. That is how our tradition is.' Other women who were attending IDE's trainings would like to see some more attention directed towards women. For example by giving women, who are a little behind in their knowledge, extra training about farming and marketing. One of the interviewed women with an individual plot expressed the desire to get more help from IDE in her own garden.

Almost all interviewed men expressed the desire to be trained with their wives, so they could share their knowledge and help each other with farming. The interviewed men said the following about why both men and women should be trained: 'Two persons remember more than one', 'You never know who is the first one to die. Women should have knowledge about farming as well, so they can take care of themselves' and 'When I am not around, my wife does not always know what to buy or what to do. With more knowledge she can help me better'. However, when I asked one of the men why he did not take his wife to the meetings with IDE, he told me his wife was busy with other things: 'When time is limited you have to split as couple. One does this, the other does that.'.

During the interviews most men had the opinion that women should primarily be trained on using fertilisers and chemicals and on technical issues, as the maintenance of a pump. On the contrary women had often not much interest in learning more about fertilisers, chemicals or pump maintenance. Probably because they did consider themselves as quite knowledgeable about these topics or they did not like the idea of fulfilling even more jobs next to their usual farming tasks and household activities. When for example a treadle pump was broken, women asked their husband to repair the pump. Not only because they had maybe less knowledge about how the pump should be repaired, but also because they did not consider it as *their* task. It was not *their* burden the pump was broken.

A minority of the farmers interviewed wanted IDE to train both men and women about gender issues. Through other development programs most farmers already knew about the concept gender and its implications for the organisation of the household. As one farmer expressed: 'In history men used to be the leaders of the household. Women did not have a say. 'Gender' has helped men to understand a wife can do all sort of things. She must be involved in decision making. This is beneficial for both men and women.'.

5.3 The RPI project and its effect on gender relations in Zambian rural households

Women in Zambian rural households face thus several important constraints to participate (actively) in farmer group meetings and trainings organised by IDE Zambia. However, until this moment, IDE does not explicitly take these constraints for women into account. As explained in chapter 4 gender issues do not belong to the core of IDE's RPI program. The RPI program is focussed on the production and marketing of smallholder's cash crops. Cash crops are grown on the collective household fields, which are owned by the head of the household and from which the income is mainly in control of the head of the household. Consequently, IDE's attention is drawn to the farming activities of the head of the household, which in Kafue and Kabwe is generally a man. For example, the questions in the interviews IDE Zambia uses to get more information about the economic impact of the treadle pump on households who bought the pump, are only focussed on the main fields were cash crops are grown. No questions are asked about the possible individual plots of women and their farming activities. The interviews are mainly done by field officers and although most of the field officers know in some households women have their own plot as well, they just ask the questions which are prepared by their colleagues working at the head office in Lusaka. The answers given during the interviews show often just one side of the story. As stated in chapter 4, in itself nothing is wrong with helping specifically men to become more effective market participants, but IDE seems not aware of the effect their project approach has on both men and women living in rural households and communities.

From the data presented in this chapter can be concluded that within the interviewed rural households men and women have often different roles, responsibilities and tasks. However in performing these roles and tasks women and men living in the same household are dependent on one another. In Kafue and Kabwe marriage can be seen as a set of entitlements and claims of value to both men and women. When a wife and a husband can get along very well, marriage is not necessarily a relationship of power and inequality which disadvantages only women. However when things go wrong and a husband dies or wants to divorce from his wife, women in Kafue and Kabwe are because of the patrilineal inheritance system often left with nothing. As can be concluded from the analysis of the impact of the treadle pump on gender roles and needs, IDE's RPI project approach consolidates these existing gender roles in rural households and communities. Because IDE considers farmers as individual entrepreneurs and makes no distinction between men and women, the specific constraints of men and women are not taken into account. In the RPI project this liberal approach results in the support of men's farming role on the collective household fields, while women are not directly supported.

5.4 Conclusion

Within Kafue and Kabwe the rural households, in which the farmers I interviewed lived, had a lot in common, but differed as well. In general land is owned by men, while women gain their right to land through their husbands. In some households women had their individual plots, on which they grew crops for home-consumption. On the collective household plots, both garden and rain fed fields, mainly cash crops were grown. Men, women and often the elder children worked hand in hand in these fields and were almost equally involved in all farming tasks. The proceeds of the collective household plots are in principle used for the benefit of the entire household, but men have the final control about what the money is spend on.

Next to farming, for all interviewed women reproductive tasks formed a major component of their daily workload. Men, on the other hand, did not have clearly defined reproductive roles. Therefore the interviewed women had often more work to do than the interviewed men and had less time to

rest. However, overall the fact men did not have clear defined reproductive roles did not mean men were doing nothing when their wives were busy with household activities. Men used part of their time, which they did not spend on household tasks, on other tasks, such as buying fertiliser or chemicals.

Within the village communities of Kafue and Kabwe men and women had different roles as well. While for women the neighbourhood was often an extension of their domestic arena, for men the community formed the public world of politics. Meetings and gatherings are traditionally not a place for women.

In Kafue and Kabwe the rural households can be characterised as overlapping but semi-autonomous production and consumption units. Men and women living in the same household, as stated in the text above, often have different roles, responsibilities and tasks. However in performing these tasks men and women are dependent of on another. In Kafue and Kabwe marriage can be seen as a set of entitlements and claims which are of value for both husband and wife. This means the lives and well-being of men and women living in the same household are interdependent and all activities taking place within a rural household can not be considered as a concern of simply individuals. Therefore, in contrast with IDE's notion of farming as a business of individuals, it can be concluded that farming in rural households in Kafue and Kabwe is rather a collective business in which all household members are involved and the roles of men and women are interdependent. By approaching individual farmers IDE does not account for the dynamics within a rural household, which, as will be explained later, has important implications for the effect of its project approach and the introduction of treadle pumps on both men and women in Zambia.

The IDE promoted treadle pump is, as other low-cost irrigation and farming techniques, mainly used on the collective household fields. As expected by IDE, farmers who adopted the treadle pump, where able to increase their production of cash crops and raise their income in a range of $200 to $300. The extra income did increase the welfare of the entire household, but did not necessarily lead to extra income controlled by women. Even women with individual plots could often not benefit directly from a newly bought treadle pump. Because irrigating with a treadle pump needs at least two to three people and for women it is difficult to mobilise labour for farming on their individual plot, irrigating with buckets was for most women more practical. Because the extra income originates mainly from the proceeds of the collective household plots, men had the final control over the treadle pump's benefits.

Next to the fact most women could not benefit directly from the introduction of treadle pumps, the participation of women in IDE's RPI project is low. Women do often not go to trainings and farmer meetings and if they do go it is not clear if the level of training is adequate for them. An important reason for women's low participation is the traditional division of tasks, in which men are usually in charge of irrigation and the production of cash crops and are usually the ones who go to public meetings. IDE's RPI project approach consolidates these existing gender roles. Because IDE considers farmers as individual entrepreneurs and makes no distinction between men and women, the different, but interdependent constraints of men and specifically women are not taken into account. In the RPI project this liberal approach results in the support of men's farming role on the collective household fields, while women are not directly supported.

6. Conclusions and recommendations

IDE is one of the many development aid organisations working within the rural areas of Zambia. The aim of IDE is to end rural poverty through increasing the incomes from small-scale farmers by expanding their production of cash crops. Although land and water are on most places in Zambia abundant, smallholders face many other constraints to expand their production of cash crops. Important constraints are a difficult access to inputs and credit, a lack of affordable irrigation techniques which are customised for small plots and a difficult access to output suppliers and sustainable markets. IDE is quite ambitious in achieving its goal. In its current RPI project IDE tries not only to nullify most of the constraints smallholders face to increase their production and income, IDE also has the ambitious aim to help about 14.000 Zambian rural families to increase their income from agriculture.

In 2006 IDE started its current project Rural Prosperity Initiative in Zambia. Within this project IDE tries to strengthen the linkages between small-scale irrigation development and poverty alleviation by helping smallholders becoming more effective market participants. The RPI project is based on the PRISM or 'Poverty Reduction through Irrigation and Smallholder Markets' approach. The PRISM approach is developed by IDE and is a market-based approach. Although IDE admits market forces only are not enough to end poverty of rural households and often help or subsidies are needed to lift most of the constraints smallholders face, they emphasise it is the demand for cash crops that will, in the end, stimulate the production and increase farmer's income.

Within the RPI project, the promotion of treadle pumps and the establishment of its supply chain are an important component of the entire project. Small-scale farmers in Zambia have a tradition of growing vegetables and fruits in their so-called gardens. During the dry season they irrigate their vegetables and fruits with water from a dug well or nearby stream. This is usually done with buckets or watering cans, because other irrigation techniques are not suitable for small plots or too expensive. Irrigating with buckets is however a very slow, heavy and labour intensive job. Farmers are often not able to apply enough water on their fields and therefore the crops grown in the garden frequently suffer from water shortage. IDE thinks the treadle pump is an suitable and affordable alternative to bucket irrigation. Because with a treadle pump much more water per second can be applied on a certain area, IDE beliefs that farmers who use the pump can increase their production and finally increase their income as well.

The interviewed farmers in Kabwe and Kafue who were at first irrigating with buckets, but now owned a treadle pump, could indeed increase their income with an average of $250 per year when they started to use the pump. Because with the treadle pump most farmers were able to produce more crops per hectare from a better quality and were able to expand their gardens as well, the production of cash crops and consequently the income from farming could be increased.

However according to intra-household models the introduction of new technologies has often different impacts on the different members living in the same household. Specifically for women, some general benefits for the household, do not necessarily have to be a benefit for them as well. To make sure the introduction of technology is indeed positive for all members of a household, an understanding of the different roles and needs of both men and women is therefore important. Only then, according to most feminist researchers, approaches and interventions for introducing technology can be developed which have the biggest chance for success.

During my period of field research IDE Zambia was seeking how to address gender issues in their RPI program. In chapter 4 the ideas of IDE and IDE Zambia about gender and rural households, which inform their RPI project at the moment, are described. First of all, considering the idea why

gender should be addressed in their project, IDE seems to follow the line of thought of one of their donors, the Bill and Melinda Gates foundation. During my period of field research in Zambia I got the impression that IDE believes addressing gender issues in their project will in the end enhance the production of small-scale farmers. Women are thus seen as economic assets and according to IDE their inclusion in the project will increase overall economic efficiency and is automatically linked with increased equity. However in its project proposal and the literature which informs IDE and IDE Zambia's RPI project and its field approach, it is absolutely not clear how IDE will assure women's (economic) inclusion. Little is said about gender in these documents and papers. All documents are written in a gender 'neutral' way.

As stated in chapter 4 IDE seems to consider farming as a business of individuals. Core of the RPI program is helping the individual farmer with increasing his or her income by producing cash crops and selling these crops on the market. In accordance with this liberal approach, IDE makes no distinction between male and female farmers. However, as can be concluded from the case study, small-scale farming in Kafue and Kabwe is a collective enterprise in which all household members are involved and the often different roles of men and women are interdependent. Introducing farming techniques and approaches which enhance agricultural production implies therefore an understanding of the dynamics within a rural household. Yet, it implies an understanding of gender; an understanding of the interdependencies and social relations between people living within a household and community. Nevertheless, within the literature on which IDE's project approach is based, gender is not considered as one important structuring variable in transforming the RPI program inputs into outputs and benefits for all household members.

In accordance with its market-based and liberal project approach, IDE and IDE Zambia seem not to consider their own role and influence on gender issues. Gender is mainly seen as a technical and unambiguous concept, which can be taught just as the use of chemicals or treadle pump maintenance. The fact development programs can have a different impact on men and women and the fact the project approach in a development project defines how both men and women are affected, is not reflected on by IDE. Nonetheless, as can be concluded from the data presented in the case study in chapter 5, IDE's RPI project approach has a different impact on men and women living in the same household, with as result that women are less supported in their roles and needs than men.

Because IDE and IDE Zambia do not explicitly consider gender issues in their RPI project and the core of their project is focussed on increasing the income of individual farmers by expanding their production of cash crops and selling these crops on the market, automatically the attention of IDE and IDE Zambia is directed towards the farming activities of men. Men are in Kafue and Kabwe usually the ones who own the collective household fields were the cash crops are produced and who are in control of the money earned with these cash crops. Because the IDE promoted treadle pump is, as other low-cost irrigation and farming techniques, mainly used on the collective household fields, men are in direct control of its benefits. Usually the extra income earned by irrigating with a treadle pump was used for the benefit of the entire household, but the adoption of treadle pumps did, as can be concluded from the data presented in chapter 5, often not lead to extra income controlled by women. Even women with a individual plot could often not benefit directly from a newly bought treadle pump. Women cannot mobilise labour as easily as their husbands, therefore it is often difficult for them to make use of the new irrigation possibilities on their own plots and increase their individual income.

Next to the fact most women could not benefit directly from the introduction of treadle pumps, the participation of women in IDE's RPI project is low. Women do often not go to IDE's trainings and farmer meetings and if they do go it is not clear if the level of training is adequate for them. An important reason for women's low participation is the traditional division of tasks, in which men are usually in charge of irrigation, the production of cash crops and visiting meetings. IDE's RPI project approach consolidates these existing gender roles. This is not a direct problem when a husband

and a wife can get along well, but when a husband dies or want to divorce from his wife, women in Kafue and Kabwe are because of the patrilineal inheritance system often left without land, house or children. Because both IDE and IDE Zambia consider farmers as individual entrepreneurs and make no distinction between men and women, the different, but interdependent constraints of men and specifically women are not taken into account. In the RPI project this liberal approach results in the support of men's farming role on the collective household fields, while women are not directly supported.

To ensure the inclusion of women in the RPI project, IDE and IDE Zambia should pay more attention to the different roles and needs of men and women living in a rural household or community and their interdependencies. Specifically, more attention should be directed to women's difficulties to access household resources, treadle pump benefits and labour. When things go wrong in marriage women have a weaker 'fall-back position' than men and therefore more control over household resources can be identified as a crucial strategic need for women in order to benefit fully from the RPI project and the introduction of treadle pumps. Also, to make it easier for women to attend meetings and to assure their fuller participation IDE and IDE Zambia could think of separate trainings and meetings for women. With separate trainings or meetings for women the discussion within a household about who should go to IDE's meetings is avoided and will probably enhance women's more active participation during the meetings, which makes it easier for IDE to identify the needs and views of women.

As can be concluded from the results in chapter 5, the constraints women face to participate (actively) in IDE's RPI project are complex and not easy to solve. An example is the lower education level women often have compared to men or their responsibility for domestic tasks. Therefore it is sometimes difficult for women to follow certain topics, which are discussed during the trainings, or it is impossible for women to follow the trainings at all. If IDE is serious about its plans to include gender in its Zambian RPI project, a broader program is needed. This implies that parallel to the RPI project other programs, which deal with women's roles and specifically the crucial need for women to get more control over household resources, must be started. For example a program in which less labour-intensive techniques to prepare and cook food are introduced or a program in which women can get their own field and treadle pump. As explained in chapter 3 the allocation of land and irrigation technology to both women and men could have a positive effect on irrigated production and has the potential to increase IDE's project impact on the income of both men and women living in the same household.

However, these recommendations are time-intensive, which implies a more tight working-schedule for the field officers or a bigger budget to hire more employees. Although IDE does a good job in involving as much farmers as possible in their RPI project, it is also a major constraint in involving women more directly. At the moment field officers have simply a lack of time to address gender issues in their areas. IDE tries to relief the working pressure of field officers by creating zones, which can be trained instead of farmer groups. However when farmer groups are trained by zone-members, most trainings will still be dominated by men and IDE has even less control on what is happening during the trainings. Even if zone-members are trained about gender, it is not guaranteed they *practice* gender.

The way IDE has organised its RPI project in Zambia at the moment, implies IDE has to make choices considering the implementation of gender in its program. First of all IDE should make a choice which line of thought should be followed in order to reach the proposed project goals and be gender 'sensitive' as well. As can be concluded from chapter 3, approaches and interventions for introducing technologies in poor rural households which are positive for all members of a household, and then specifically women, is difficult. Within the development arena, gender is a much contested concept. Gender is an ambiguous term and can have many different meanings to different stakeholders. Also for IDE applies that seeking for the best way to address gender in its project is a struggle between different views and narratives about gender. Donor organisations,

such as the Bill and Melinda Gates foundation, have their own ideas about how gender should be addressed, but also IDE employees, field officers and farmers themselves have their specific view about what is needed and what is not. This makes seeking for the best way to address gender sometimes very confusing. As stated earlier, IDE has not a clear idea yet about how gender should be addressed in their program, but seems, not surprisingly, to follow the line of thought (or myth) of the Gates foundation. Their ideas about gender are according to the third WID approach or efficiency approach and although IDE's market-based approach matches perfectly with the efficiency approach, the in Kafue and Kabwe important reproductive role of women remains under-exposed in this approach.

Secondly IDE has to make a choice what is possible and what is not. Combining the ambitious goal of increasing the income of 14.000 Zambian smallholders with attempts to be gender sensitive as well is maybe impossible for IDE and its current budget. Although it is important for IDE to consider if its project does not have severe negative impacts on women, it is important as well that IDE asks itself what is in their realm to change. Tradition in Zambia is strong and changing the roles of women and men is not done overnight. Instead of trying to address gender all by itself, IDE Zambia can also try to link with NGOs who have gender issues as core of their development programs and combine their efforts.

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Appendix A Semi-Structured interviews with treadle pump farmers

MSc Research Famke Ingen-Housz – IWE Wageningen University

Date interview:

Person interviewed:

Name of household head:

District:

Village:

Total area of land:

Distance to nearest market:

Tribe: ○ Bemba ○ Kaonde ○ Lozi ○ Tonga
○ Cewa ○ Lunda ○ Luvale

Religion: ○ Christian ○ Muslim ○ Other

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1. Household composition

Name:	**Gender:**	**Age:**	**Relation to Household Head*:**	**Main occupation**:**	**Years of education:**

*Wife, Husband, Father, Mother, Son, Daughter, Brother, Sister, etc.

**Farming family fields, House keeping, Attending school, Off-farm employment, Off-farm employment farming, others.

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2. Description of land units:

Land Unit:	**Description:**	**Ownership:**	**Area:**
LU 1	Homestead area		
LU 2			
LU 3			
LU 4			
LU 5			

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3. Crops and Land Use

Land Activities:	**Activities:**	**LU:**	**Water abstraction method*:**	**Irrigation method**:**	**% of area irrigated:**
LA 1	Homestead				
LA 2					
LA 3					
LA 4					
LA 5					
LA 6					
LA 7					

LA 8					
LA 9					
LA 10					

***** 1) Gravity, 2) Electrical pump, 3) Treadle pump, 4) Fuel pump, 5) Bucket, 6) Others.

** 1) Flood, 2) Furrow, 3) Drip, 4) Sprinkler, 5) Spot/ Bucket, 6) Others.

3.1 Who decides on the cropping patterns and land use on the different land units? (diff. crops for different gender?)

---

4. External inputs in Land use Activities

Land Activities:	**Source of input*:**	**Bought from (when?):**	**Who bought input:**	**Quantity**	**Price per unit:**
LA …					
LA …					
LA …					
LA …					
LA …					
LA …					
LA …					
LA …					
LA …					
LA …					

* seed, fertilizer, manure, pesticides, hired labour, machinery rent, fuel for irrigation, etc.

4.1 Who decides which inputs are used for the different land use activities?

---

5. Outputs from Land use Activities

From LA:	Market*:	Buyer**:	When (month):	What product:	Quantity:	Price per unit:
LA …						
LA …						
LA …						
LA …						
LA …						
LA …						
LA …						
LA …						
LA …						
LA …						

* 1) On-farm scale, 2) Local market, 3) District market, 4) Lusaka market, 5) Cooperative/ Collection centre.
** 1) Traders, 2) Consumers, 3) Cooperatives, 4) Others.

5.1 What part of the crop yield is used for home consumption? Which crops and how much?

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6. Treadle pump irrigation

6.1 How did you know about the treadle pump?

6.2 Before you adopted the treadle pump with what technique were you irrigating your fields or garden?

6.3 Why did you choose to irrigate with a treadle pump?

6.4 Why are other farmers in your neighbourhood, who did not procure a treadle pump, not using the pump to irrigate?

6.5 Where was the treadle pump procured? How much did the treadle pump cost? When was the pump procured?

6.6 Who bought the treadle pump and why?

6.7 How was the treadle pump financed?

6.8 Did the adoption of the treadle pump increase the households income? (amount of money per year?)

6.9 If the household income did increase because of the adoption of an treadle pump, whose income did increase specifically? (Whose holding the purse? With what activities?)

6.10 What other income sources do the different household members have next to farming? Why?

6.11 Did this change when the treadle pump was adopted? Why?

6.12 Did the total area of irrigated area change when the treadle pump was adopted? (change in m2) Why?

6.13 Did the total area of land which is used for farming change after the introduction of the treadle pump? Why?

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7. The impact of introducing treadle pump irrigation on gender relations

7.1 How are the tasks in treadle pump irrigation divided in the household? (See table below) Specify in hours per week.

Task	Household Head	Spouse	Children	Hired Labour (m/f)	Others	
Treadling						
Diverting water in the field						
Land preparation						
Plot layout						
Planting						
Weeding						
Fertilizer application						

Harvesting						
Maintaining the water source						
Procurement of inputs						
Transportation of produce to market						
Selling produce						

7.2 Why are the tasks performed as such? Who decides on how the tasks are divided? How were the tasks performed before you procured a treadle pump?

7.3 How are the tasks concerning the rain fed fields divided within the household? (See table below) Specify in hours per week.

Task	Household Head	Spouse	Children	Hired Labour (m/f)	Others	
Land preparation						
Plot layout						
Planting						
Weeding						
Fertilizer application						
Harvesting						
Procurement of inputs						
Transportation of produce to market						
Selling produce						

7.4 Why are the tasks performed as such? Who decides on how the tasks are divided? How were the tasks performed before you bought a treadle pump?

7.5 What benefits has treadle pump irrigation? Are these benefits the same for the different household members?

7.6 What drawbacks has treadle pump irrigation? Are these drawbacks the same for the different household members?

7.7 When the products of the treadle pump garden are sold how do you share the money?

7.8 Who decides on sharing the benefits (money earned by selling garden products)?

7.9 What happens if the other household member does not agree with the way the benefits are shared?

7.10 Have you ever heard about the concept gender?

7.11 One of IDE's programs is about 'gender issues'. Do you know 'gender issues' in general which IDE could target?

Appendix B Semi-Structured interviews with farmers not owning a treadle pump

MSc Research Famke Ingen-Housz – IWE Wageningen University

Date interview:

Person interviewed:

Name of household head:

District:

Village:

Total area of land:

Distance to nearest market:

Tribe: ○ Bemba ○ Kaonde ○ Lozi ○ Tonga
○ Cewa ○ Lunda ○ Luvale

Religion: ○ Christian ○ Muslim ○ Other

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1. Household composition

Name:	**Gender:**	**Age:**	**Relation to Household Head*:**	**Main occupation**:**	**Years of education:**

*Wife, Husband, Father, Mother, Son, Daughter, Brother, Sister, etc.

**Farming family fields, House keeping, Attending school, Off-farm employment, Off-farm employment farming, others.

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2. Description of land units:

Land Unit:	**Description:**	**Ownership:**	**Area:**
LU 1	Homestead area		
LU 2			
LU 3			
LU 4			
LU 5			

---

3. Crops and Land Use

Land Activities:	**Activities:**	**LU:**	**Water abstraction method*:**	**Irrigation method**:**	**% of area irrigated:**
LA 1	Homestead				
LA 2					
LA 3					
LA 4					
LA 5					
LA 6					
LA 7					
LA 8					

LA 9					
LA 10					

***** 1) Gravity, 2) Electrical pump, 3) Treadle pump, 4) Fuel pump, 5) Bucket, 6) Others.

** 1) Flood, 2) Furrow, 3) Drip, 4) Sprinkler, 5) Spot/ Bucket, 6) Others.

3.1 Who decides on the cropping patterns and land use on the different land units? (diff. crops for different genders?)

---

4. External inputs in Land use Activities

Land Activities:	**Source of input*:**	**Bought from (when?):**	**Who bought input:**	**Quantity**	**Price per unit:**
LA …					
LA …					
LA …					
LA …					
LA …					
LA …					
LA …					
LA …					
LA …					
LA …					

* seed, fertilizer, manure, pesticides, hired labour, machinery rent, fuel for irrigation, etc.

4.1 Who decides which inputs are used for the different land use activities?

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5. Outputs from Land use Activities

From LA:	Market*:	Buyer**:	When (month):	What product:	Quantity:	Price per unit:
LA …						
LA …						
LA …						
LA …						
LA …						
LA …						
LA …						
LA …						
LA …						
LA …						

* 1) On-farm scale, 2) Local market, 3) District market, 4) Lusaka market, 5) Cooperative/ Collection centre.
** 1) Traders, 2) Consumers, 3) Cooperatives, 4) Others.

5.1 What part of the crop yield is used for home consumption? Which crops and how much?

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6. Small-scale irrigation

(When farmer is using buckets to extract water and to irrigate it's land, go on with part 7. Bucket irrigation.)

(When farmer does not irrigate it's land, go on with part 8. Rain fed farming.)

6.1 When did you start irrigating your field(s) with the irrigation technique you are using at the moment?

6.2 Before you adopted the irrigation technique you are using at the moment, with what technique were you irrigating your fields or garden?

6.3 Why did you choose to irrigate with the irrigation technique you are using at the moment?

6.4 Where were the irrigation devices needed procured? How did you know about the irrigation method you are using at the moment?

6.5 Who bought these irrigation devices and how were they financed?

6.6 Did the adoption of the irrigation technique you are using at the moment increase the households income? (amount of money per year?)

6.7 If the household income did increase because of the adoption of the irrigation technique you are using at the moment, whose income did increase specifically?

6.8 What other income sources do the different household members have next to farming? Why?

6.9 Did this change when you adopted the irrigation technique you are using at the moment? Why?

6.10 Did the total area of the irrigated area change when the irrigation technique you are using at the moment was adopted? (change in m2) Why?

6.11 Did the total area of land which is used for farming change after the introduction of the irrigation technique you are using at the moment? (change in m2) Why?

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7. Bucket Irrigation (without a pump to extract the irrigation water)

7.1 Why are you using buckets to extract the water and irrigate your fields?

7.2 Would you like to irrigate with a different irrigation technique? Which one and why?

7.3 Where do you extract the water from?

7.4 What other income sources do the different household members have next to farming? Why?

---

8. Rain fed farming only

8.1 Why are you not irrigating your fields?

8.2 Would you like to irrigate your fields? With which technique and why?

8.3 What other income sources do the different household members have next to farming? Why?

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9. Labour allocation and gender relations

a. **9.1 How are the tasks in irrigation and on the fields irrigated divided in the household? (See table below) Specify in hours per week.** *(If farmer isn't irrigating go on with 9.3)*

Task	Household Head	Spouse	Children	Hired Labour (m/f)	Others	
Extracting/ pumping water						
Diverting water in the field						
Land preparation						

Planting						
Weeding						
Fertilizer application						
Harvesting						
Maintaining the water source						
Procurement of inputs						
Transportation of produce to market						
Selling produce						

9.2 Why are the tasks performed as such? Who decides on how the tasks are divided?

9.3 How are the tasks concerning the rain fed fields divided within the household? (See table below) Specify in hours per week. *(If a farmer doesn't have rain fed fields go on with 9.5)*

Task	Household Head	Spouse	Children	Hired Labour (m/f)	Others	
Land preparation						
Planting						
Weeding						
Fertilizer application						
Harvesting						
Procurement of inputs						
Transportation of						

produce to market						
Selling produce						

9.4 Why are the tasks performed as such? Who decides on how the tasks are divided?

(If farmer isn't irrigating its fields go on with 9.8)

9.5 What benefits has the irrigation method you are using? Are these benefits the same for the different household members?

9.6 What drawbacks has the irrigation method you are using? Are these drawbacks the same for the different household members?

9.7 When the products of the vegetable garden or rain fed fields are sold how do you share the money? Who decides on the way the money is spend?

9.8 What happens if the other household member does not agree with the way the benefits are shared?

9.10 ? Have you ever heard about the concept gender?

9.11 One of IDE's programs is 'gender issues'. Do you know 'gender issues' in general which IDE could target?

