Keeping an Eye on Decentralization and Specification of a Resource Policy: an Overview of the Policy Study to the Promotion of RWH

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Abstract

Recently, in Ethiopia, RWH as an alternative water supply option has received a lot of attention as development actors and scholars, has increasingly recognized the importance to mitigate the problem of physical as well as economic water scarcity. This has resulted in widespread agreement to work towards the promotion of RWH technologies and efficient use of rainwater resources. However, the attraction of many actors, on the other hand, resulted in varied perceptions over the use, management and promotion of rainwater. This in turn has resulted in a heated debate about the solution to the crisis of rainwater management among stakeholders. The stakeholders' debates over the crisis of rainwater management have usually proceeded in terms of a divergence between appropriate rainwater policy and state political commitment to implement plans, in which stakeholders are largely, followed the treatment that it would be desirable to make low political commitment, not policy, liable for the crisis of rainwater management. The author of this paper argues that all stakeholders including government have debated over the different angles of the same problem; some with the structure of rainwater policy (decentralization of policy) and others with content (specification of rainwater policy). Basically, they are all debated over a single problem that is about policy. The author, rather, believe that all the debates are justifications on the need of rainwater specific and decentralized policy, even, the wider gap in perceptions itself is the result of lack of sound rainwater policy. It is the author's strong contention that in the absence of specified and decentralized resource policy, it is unnecessary, even undesirable, to debate over crisis of a resource management. What is important is to keep an eye on the content and structure of a rainwater policy; all the other problems are the by-products of a policy defects.

The Policy Study

ERHA held its 2nd general assembly; members, representatives of government, NGOs, donor agencies and SEARNET met in Addis to discuss the different concerns of rainwater use, management and development. A number of papers were presented on different concerns of RWH, which ranged from technical to social. Presenters forwarded quite a large number of important recommendations based on their experiences and professional background. Finally, some critical questions were raised from participants: who were responsible for the implementation of the recommendations? How ERHA and the people could monitor and supervise the implementation of the recommendations? How can we make government accountable to the implementation of the recommendations? The participants were realized that these questions could only be answered from water policy document. To this end, one proposal came out of the workshop: to conduct a policy gap analysis that would help to understand the different policy issues that hinder the use, management and promotion of rainwater.

With this intention, The Ethiopian Rainwater Harvesting Association (ERHA) in collaboration with Southern and Eastern Africa Rainwater Harvesting Network (SEARNET) commissioned a policy research mandated to conduct a policy research that can examine the policy gaps and their implications in terms of rainwater harvesting, which could be used as an

input for policy advocacy that geared towards addressing the problem of domestic water supply, sanitation and household food insecurity. This paper is an overview of the final policy research titled Policy Issues to the Promotions of Rainwater Harvesting: The Case of Ethiopia, which was produced by the same author in December 2005.

How Serious is Ethiopia's Water Crisis?

Water supply in many parts of Ethiopia is entering an era of physical and economic scarcity. As a result, the country is one of the most food insecure countries on the globe due to scarcity of water resources combined with frequent occurrence of drought. Today, water scarcity problem is more and more sever in Ethiopia due to the increase in the: 1) supply side problems- such as the increase in population pressure, degradation of the natural environment, increase in livestock pressure, the increase in cost of supply and the increase in demand for other uses such as industries; 2) demand side problems such as the increase in demand for different services of water by different users and sectors; and 3) structural side problems such as lack of effective and efficient water institutions that ensure equitable allocation of the nominally accessible water among users and use systems. This is exacerbated by poor performance of the water sector due to lack of effective water institutions (water policy, laws and administration). Moreover, since most rivers of Ethiopia are crossing borders; implementation requires negotiation with downstream countries, which is politically challenging not to mention the manpower and political constraints. This scarcity has contributed a lot to the social, economic, environmental and political crisis in the country. In this regard, mention can be made of the presence of: water borne diseases which account for 70% of total diseases; the fact that 40/75% of the urban/rural population has no access to clean drinking water respectively, 95% of the population has no access to electricity, the country has lost 25% of livestock due to the recent drought; and on average 6 million people are exposed to recurrent drought annually including the surplus producing areas.

Agriculture consumes 86% of total water withdrawal and it is one of the sectors that have been suffering from high degree of water scarcity. The study conducted by DPPC (2001) revealed that the frequency and severity of drought seems to have increased from time to time even in the surplus producing areas mainly due to the late onset or failure of both the main and short rainy seasons. For instance, on average more than 6.3 million people are exposed to hunger on yearly basis. This has resulted in malnutrition and low level of calorie intake. CSA (2000) reported the impact of food shortage (malnutrition) on children under age five as one of the highest in the world with the level of 47% underweight, 52% stunted and 11% wasted, respectively.

According to the author estimation, the net scarcity of irrigation water for cereal production is increasing at a rate of 6.6%, which is the difference between estimated irrigation water demand growth rate and estimated planned irrigation water supply growth rate for cereal production. In other words, if we assume that irrigation is the only means to fully escape from cereal deficit and diversion is the only means of accessing irrigation water, Ethiopia has to increase its irrigation water supply for cereal production by 7% annually or increasing the current plan of agricultural water supply by 6.55% annually. The estimations further reveals that given the current status and irrigation water supply plan, Ethiopia will require 77 years to fully escape from 2004 cereal deficit, which will require 4247 million m^3 of additional irrigation water. The current irrigation water supply plan for cereal production will only reduce 23% of the 2004 cereal deficit at the end of the planning period (2016). The estimation was done based on WHO standard of calorie requirement with certain assumptions like all water development plans will be realized and rainfall will be normally distributed (year 2001 production as base year). One can imagine how the late onset and uneven distribution of rainfall, and ill-performance of water development plans, which happens most often, can further aggravate the scarcity of water for agricultural production.

Next to agriculture, domestic water supply is the second high water consuming sector in the country. The domestic water coverage of the country is very low both in urban and rural areas. The national water coverage at the rate of 15 lpd for rural areas and 30 lpd for urban areas is estimated to be 15% and 65.5 % excluding Addis Ababa, respectively. About 40% of the existing rural water supply schemes are not functioning and people have to travel long distances to fetch unsafe water from rivers and other sources. Water is a health issues for about 75% of the population, who does not have clean potable water, and 92% of the population, who does not have access to adequate sanitation facilities. The coverage varied across regions. According to the author's estimates, assuming all the current plans are realized and if domestic water supply is to be continued in the same rate, Ethiopia will require additional 3 years and 11 years (after 2016) to achieve the MoWR recommendations (50lpc to urban areas and 25lpc per day to rural areas) of the 2004 and 2016 domestic water demand respectively. On the other hand, to achieve the 2004 UN recommendation (50lpc), Ethiopia will require additional 23 years from 2016. The most important domestic water supply in rural areas comes from groundwater sources even if the total available ground water potential of the country is not yet certainly known.

The above two sectoral scarcity analyses provide strong evidence that the current water scarcity gap is very high and it will continue even after 2016. These problems call for a new approach that enhances efficient management of the available water resources and identification of alternative freshwater augmentation technologies. To resolve the water scarcity problems, Ethiopia issued a water resource management policy in July 2000 with the overall goal of enhancing and promoting the national efforts towards the efficient, equitable and optimal utilization of the available water resources for the socioeconomic development of the country in a sustainable manner. Based on this policy, the country also developed Sectoral Water Development Strategies and 15 years (2002 to 2016) Water Development Programmes in 2001.

What Potential Roles Could RWH Play to Reduce the Water Crisis in Ethiopia?

The research confirmed that rainwater has a potential role to contribute towards the multi-sectoral national development policies; and there is also a fertile ground (natural and utilization potential opportunities) for rainwater to play its vital role in all sectors of development. For instance, rainwater can help to achieve the national water management policy objectives through: i) improving the sustainability of water use as rainwater is a mother source of all water; ii) enhancing equity of water use across regions as the only viable water sources in moisture stress areas; iii) enhancing groundwater potential; iv) maintaining the hydrological balance (water cycle); v) mitigating over flooding due to excess rainwater; vi) improving efficiency of water uses and cost of water supply; vii) increasing the negotiation power of the country over the use of trans boundary rivers; viii) improving the success of watershed management and environmental protection interventions; and x) improving the different water services demand of users and sectors. Hence, rainwater management is the "ice-cream" of all other water resources management. It could be one of the key alternatives for the achievement of the national water management policy targets. It could also help to address both the cross cutting and sectoral objectives of the national water management policy.

Moreover, rainwater could also help to addresses the five strategies, Ministry of Agricultural and Rural Development strategies that have been designed to deal with food insecurity problems of moisture stress areas of the country. These are:

i) Emergency assistance, which refers to provision of food and water without being displaced either through food for work for those able to work and free handout to those who are not capable of working;

ii) Resettlement program – transferring a certain section of the drought affected people

to areas where there is enough water and fertile land;

iii) Natural resource development and development of animal resources, which is the strategy aiming at reducing the pressure on land by shifting the livelihood of people from cultivation to rearing of animals;

iv) Improving water resources utilization by promoting the utilization of ground and surface water so as to satisfy the different needs of the people; and

v) Soil conservation.

Thus, rainwater harvesting could be one of the most important options to address the policies and strategies of drought prone areas of the country including the settlement areas (since these are areas where there is no any form of water supply structure before). This is basically true for two reasons. First, the policy strategies create an enabling environment for the promotion of rainwater harvesting. For instance, the emergency assistance through food for work could be used as resources to finance natural resources development, soil and water conservation activities. On the other hand, conservation and efficient utilization of rainwater mean addressing food security through reducing soil erosion (increasing soil fertility), developing the environment (enhancing sustainability of resources use) and accessing the different services of water including source of water for livestock and pasture development. Besides, the major water consuming sectors, RWH can play a vital role in improving the water supply of livestock, wildlife, rangeland development and nursery site development. It can also help to mitigate emergencies created due to shortage of water (drought) and flooding.

Ethiopia has a fertile land, untapped rainwater potential and use opportunities, which could make rainwater utilization less costly as compared to other alternative sources. There are plenty of concrete evidences that support Ethiopia has untapped runoff potential due to the existence of conducive climate, soil type and land surface characteristics. For instance, in some parts of Ethiopia it is common to exercise cultivation as steep as 30%. This has resulted in high yield of runoff associated with high level of erosion. Only 3% of the land is covered with forest. In most parts of Ethiopia, especially in the northeast, the vegetation cover including bush is becoming smaller and smaller for a number of reasons. This means that the country has high runoff yield as a result of low vegetation cover, among other reasons mentioned above. Most parts of Ethiopia are characterized by high amount of rainstorm amount, high yield of runoff. The rainstorm in the lowland area of Ethiopia is characterized by high intensity; meaning rainstorms intensity exceeds the rate of infiltration of the soil, resulting in high level of runoff. The distribution of rainfall is also one of the important factors that determine the yield of runoff, which is quite suitable in the case of Ethiopia.

Ethiopia is also rich in rainwater use opportunities (rainwater collection, storage and supply facilities). Since 560 BC, even before, Ethiopian people used different traditional rainwater collection facilities. For instance, roof harvesting of rain such as the use of church and school roof have long time experience in Ethiopia (Thomas et al, 2004). State promotion of rainwater-harvesting structures was started in 1970s to reduce soil erosion and as alternative intervention to address water scarcity. Other organizations like NGOs and bilateral agencies have been involved in soil and water conservation activities long time ago. Currently, a total of 450,000 modern rainwater-harvesting structures (RWH tanks/Cisterns, ponds and hand-dug wells) were constructed in four regions of the country in 2002/03 and 2003/04 (FAO, 2004). Existence of corrugated iron sheet roof, for instance, according to CSA estimate more than 50% of the population is living in houses made of corrugated iron sheet roof; the current rate of urbanization (9%) and high population growth (increasing number of houses); and the progress in the construction of social facilities such as roads, schools, health centers and other institutions will also show the availability of rainwater use opportunities.

What RWH Actions are undertaken in Ethiopia?

Recently, rainwater harvesting as an alternative water supply has received the attention of the government, civic society institutions, NGOs and donor agencies. Accordingly, some efforts have been put in the last 3 years to the promotion of rainwater harvesting and some promising results are observed in terms of addressing the problem of domestic water supply, sanitation and household food insecurity. A number of RWH promotion activities have been undertaken in relation to food security both at national and regional levels. Introduction of new technologies from abroad; preparation of technology packages, piloting of technologies, preparation of training modules and conducting training are some of the promotional activities. For instance, achievement reports indicate that 38,338 shallow wells, 205,787 household and 49,311 community ponds, 5,632 cisterns and 32,727 springs have been constructed and developed so far. These structures are estimated to irrigate 93,326 hectares of land, which will benefit 732,336 households with an average family size of 5. RWH courses are given in 25 Agricultural TVET colleges for 37, 582 students (Lakew, 2004)

Rainwater harvesting for irrigation is promoted following two different approaches, individual and community based. Both of them are promoted by the Ministry of Agriculture and Rural Development and its respective regional bureaus. Sasakawa Global 2000 (SGS 2000) in collaboration with the Ministry of Agriculture and Rural Development has been promoting individual approach at pilot project level. The Ministry of Agriculture and Rural Development (MoARD) also gives more attention to individual approaches with the aim of achieving household level food security. In the individual approach, the water is fully managed by individual water owners and the owner is also expected to cover the lion's share of the cost of the infrastructure. In the case of communal rainwater harvesting, the system is fully managed by the user community and the community is responsible to contribute labor and local material.

What is the Nature of Rainwater Management Crisis in Ethiopia?

Even though the multiples role of rainwater is widely recognized, it might be surprising that it is one of poorly managed sub-water sector in the country. The sub-sector is generally characterized by low economic, social, environmental, financial, technological and institutional performances. For the sake of simplicity, the author classified the overall crisis of rainwater use, management and development into four categories of performances namely, performances of introduced technologies, performances of technology promotions, performances of use efficiencies and performance of management.

Performances of Technology Promotion: - the performance of technology refers augmentation of RWH technologies, which can be measured from the deviation of the national RWH promotion plan. For instance, as compared to the 2004 national RWH promotion plan, the realized number of rainwater harvesting structures introduced during the physical year is by 50% less than the national target (MoARD, 2004) mainly because of inappropriate and unrealistic plans (quota system).

Performances of Introduced Technologies: - besides, the low limited number of introduced technologies (low promotion), the performances of the introduced technologies accomplishing far less than what had been expected, if not disappointing, in many areas of the country. Some evaluation reports indicate that most of the newly introduced RWH technologies had failed to achieve the physical targets in most regions of the country (in some regions up to 80%) due to low social, economic, ecological and institutional feasibility to the local context, in addition to technical problems.

Performances of Use: - the problem of RWH is not limited to the failure of introduced technologies in terms of achieving the physical targets, but also the use of feasible technologies and accessed rainwater resources. It is observed that poor operation and maintenances of feasible technologies, inefficient and

inequitable use of rainwater resources are also common in most regions of Ethiopia. This is mainly due to lack of policy instruments that provide incentive for collective action; investment for operation and maintenance; and efficient utilization of feasible technologies.

Management Performances: - lack of clear regulations on rainwater management has resulted in conflict among stakeholders on the use, management and promotion of RWH. Some of the reported problems include: lack of integration of uses; ignorance of environmental role of rainwater; lack of collaboration among actors; conflict of interest and approaches among implementers; conflict over the use and management of runoff; duplication of efforts and resources; lack of continuity of efforts; instability of implementation organs and confusion of roles, responsibilities and authority among actors; and poor maintenances and operation of communal RWH structures.

These performances problems have resulted in underutilization of the country's rainwater potentials and opportunities. This has made the contribution of rainwater to the national development plan insignificant as compared to the expected potential, but rather, under utilization of rainwater has resulted in loss of soil, ground water potential and hydrological balance of the country. This is because; unlike other resource potentials, runoff potential demands special attention for five reasons. First, it is harmful potential leading to soil erosion, if not utilized. Second, there is always a tradeoff between runoff potential and other resources potentials such as ground water. Third, the potential is created at the expense of other benefits such as soil erosion and deforestation. Fourth, it is a "perishable potential" unless we store. Fifth, under utilization has negative implication on the hydrological cycle of water and sustainability of water use. Thus, unless some actions are taken, underutilization of rainwater could affect the development of the country through reducing the potential of other economic resources such as land and other sources of water; and through increasing the economic and physical scarcity of the different services of water.

What are the Real Debates over the Management of Rainwater Crisis?

RWH as an alternative water supply option has received a lot of attention as development actors and scholars, has increasingly recognized the importance to mitigate the problem of physical as well as economic water scarcity. This has resulted in widespread agreement to work towards the promotion of RWH technologies and efficient use of rainwater resources. However, the attraction of many actors, on the other hand, resulted in varied perceptions over the use, management and promotion of rainwater. This in turn has resulted in a heated debate about the solution to the crisis of rainwater management, use and development among stakeholders.

The author identified four lines of debates from the regional workshop. The debates were generally twofold: debates on core problems of rainwater use, management and promotion crisis; and debates on root causes of the problems. Accordingly, the two core problems of rainwater use, management and promotion crisis are the existence of inappropriate policy and poor implementation; and the two main root causes for the occurrence of the core problems are lack of capacity and political commitment. The first group (Group A) of stakeholders argues that the existing national water resources management policy and implementation capacity is sufficient enough to address all concerns of rainwater use, management and promotion. According to this group, what Ethiopia lacks is the political commitment of the government to put policies into practice.

Similar to the first group, the second group (Group B) also argues that the national water resources management policy and government political commitment is fair enough to manage rainwater resources, but government has limited capacity to put the policy into practices. Group B believes that enhancing the capacity and efficiency of government institutions is a solution to the current crisis.

Unlike the first and the second group, the third group (Group C) advocate on the need of

rainwater management policy. This group argues that the current national water resources management policy is not enough to address the different concerns of rainwater resources management. Group C argue that government knows the fact very well and has also the capacity, but what it lacks is the political commitment to develop a sound water policy for rainwater management.

The fourth group (Group D) on the other hand argues that even if government is politically committed and knows the problem very well, it has not the capacity to implement sound rainwater policy. Generally, group A and B argue that implementation is the main problem of RWH and the solution is also to enhance implementation. Group C and D on the other hand advocate for the importance of rainwater management policy. Besides, these four single solution groups; there are also groups who argue on combination of causes, cause sources and solutions. All argue that the solution is to resolve the root cause of the core problems. The solution quadrants of each group are summarized below.

Accordingly, for Group A /Group B, the solution is to enhance the political commitment/the capacity of the state to put the existing policy into practices. On the other hand, for Group C / Group D, the solution is to enhance the political commitment / the capacity of the government to develop sound rainwater policy.

Table 1. Core problems and root causes of rainwater use and management as identified by regional workshop

Core problems	Root Causes	
	Political commitment	Capacity
Policy	I	III
Implementation	II	IV

I-IV = Group ID during regional workshop

However, these differences have resulted in rainwater harvesting technologies and institutions to be under pressure to change in most regions of the country. Every where, there is a challenges for rainwater resources and technology management posed by efficiency, equitable and sustainability debates and a relentless reshaping of rainwater technologies and management institutions are going on both at national and regional levels. Moreover, the differences in perception among stakeholders have further aggravated the problem of RWH. This is because, the differences in perceptions has led to some confusion.

The confusion has created four unintended negative outcomes. First, it discouraged policy makers from taking an immediate corrective policy action since policy is politically sensitive that requires first to check the social acceptability of a policy action. Second, it has increased the complexity of policy advocacy for civic society institutions like ERHA, difficult to create a pressure group for effective policy advocacy. Third, it has increased the demand of robust analytical methodologies before any decision so as to ground recommendation discussions and to defend options against their recommendation, which could increase the cost of advocacy and policy recommendation. Fourth, it has hindered the collaboration of efforts and resources among actors, but rather, it has promoted implementation of uncoordinated and conflicting approaches of rainwater management. It is found that breaking the dilemma between alternative solution options among stakeholders is part of a solution to the current crisis of rainwater use, management and promotion. Then, the next question will be how can we break these dilemmas?

Can Policy Break the Stakeholders Dilemma?

Despite the differences, all groups argue that the problems of RWH are related to either lack of government political commitment or capacity limitations or both. In other words, enhancing the political commitment to implement or develop a policy and improving the capacity limitations to implement or develop a policy are the solutions to current rainwater resources management crisis. The debates further confirmed that government is

both part of core problems and part of core solutions to rainwater resource management. Therefore, the question would be: how can we make government politically committed to implement and develop appropriate policies? How can we improve the policy formulation and implementation capacity of a government? The author argues below that it is only through policy that we can make government politically committed and get the capacity improved.

According to Len Abrams (2002) policy is defined as a set of decisions, made ultimately by the highest political level in a country after a process of dialogue and consultation, which determines what and how things will be done in any given sector. Policy in terms of resources management refers to the setout of a framework and guidelines as to how the resource in question is optimally utilized, managed, protected and conserved in a sustainable manner so as to enhance the overall economic development of the country. Thus, policy is the most important component of a water institution that influences the overall performance (economic, physical, financial and social performance) of a water sector directly and indirectly through determining the mandate of administration, the demand of capacity, legal implications and many other concerns of resource management.

A resource policy can play a multiple roles; it can serve as a framework for donors, civic society institutions, the people and government itself to examine performances of plans and political commitments. Generally, a resources policy can serve as framework: i) for donors, civic society institutions and the people to monitor and supervise the political commitment of a state towards a resource; ii) to setout the strategies and plan of a resources management, which later used as standard for the people and civic society institutions to evaluate planned achievements; iii) to make leaders accountable and transparent to their plan and political commitment; iv) to check the degree of people and other actors participation, which allow them aware of a resources development and management plans and strategies; v) to influence the inclusion of people interest and preferences in the resources management; vi) for government to allocate resources and manpower in a sustainable manner; vii) for government to undertake follow up the progress and to identify gaps of implementation so as to take corrective actions; and viii) for government to set appropriate legislation, institution and resource administration set up. Hence, absence of a resource policy means that there is no way to make government accountable and transparent to its plan and political commitment; for civic society institutions, donors and the people to monitor and evaluate planned achievements; for government itself to check its performances and to take corrective actions; and to check continuity and coordination of efforts, and integration of uses etc.

The above conventional argument to the demand of policy clearly indicates that policy can make government accountable and politically committed to its policy, plan and strategy. A resources policy can also indicate the areas of capacity limitations that create an enabling environment for donors and other civic society institutions to provide appropriate supports. Governments had policies in the past and they will have in the future. However, these policies too often did not translate into actions. This is mainly because they lack transparency that both the people and civic society did not know about them so as to keep their eyes on implementation of those policies. Given this experience, breaking up the current debates with the conventional argument is unthinkable. Because, this experiences force us to answer question like: what makes then government accountable to policies? Here, we are not interested to debate why some governments are accountable to their policy and others not? Rather, we are interested to know what types of policy makes government accountable and transparent? This defiantly requires in-depth analysis of a policy in question. To do this, the author employed other description of a policy to further argue inline with the debates.

According to the author, a sound policy has to be evaluated from its content and structure. The content of a policy can be measured by the degree of policy specification. The degree of specification determines how the “rules of the game” that governs the relation, behavior and

action of all stakeholders in relation to a resource use, management and promotion or development are specified and qualified. In principle, the higher the degree of a resources policy specification, the better will be the use, management and development of a resource. This is because the higher specification of a resource means a more clarification on rights, obligations and conditions of use, development and management of a resource and a resource use infrastructure. The content of a policy has two dimensions: i) incentive dimension- that provides the incentive to invest on a resources, efficient use of a resources and coordination of efforts and resources towards the same goal; and ii) regulatory dimension, which provides the security to enjoy with the pre-defined rights. The regulatory dimension of a policy imposes regulation over externalities, which in turn avoids all sort of conflict between users, use types, regions, sectors and implementers. More specifically, the specification of a policy provides an enabling environment for all stakeholders:

i) For end users - it provides the incentive and security to invest on RWH technologies and efficient use of rainwater resources and technologies in a sustainable and equitable manner;

ii) For implementers- it provides the incentive for collaboration and integration of their efforts towards the same goal and vision;

iii) For donors – it provides a clear framework to decide where and when to provide the right support and to monitor the achievements of their contribution;

iv) For civic society institutions- it provides a clear framework to keep an eye on the implementation of policies and to identify gaps of implementation for policy advocacy; so as to make government accountable to the people and its plans;

v) For the private sector- it provides the incentive to invest on alternative water saving RWH technologies for end users; and

vi) For government- it will be used as a guideline for strategy formulation, planning, resources allocation and monitoring and evaluation of resource sector performances. So sound policy determines the “rule of the game”, which governs the relation, behavior and action of all stakeholders in relation to a resource and a resources infrastructure.

The structural part of a policy, on the other hand, has to be measured the degree of decentralization of a policy. It is supposed to addresses the question, what type of policy structure provides incentive for efficient and effective implementation of a policy in question. Unlike the degree of policy specification (content of a policy), decentralization of a policy (a policy structure) determines the achievements of targeted development and RWH promotion plans and performances of introduced technologies. Thus, structure of a policy determines the efficiency and effectiveness of a policy; where as content of a policy influences the action and behavior of stakeholder over the use, management and development of rainwater either through providing incentive or imposing restrictions. In principle, the higher the degree of decentralization, the higher will be the efficiency and effectiveness of a policy implementation. This is because a decentralized policy provides quite a number of incentive structures to improve efficiency and effectiveness of policy implementation. Since rainwater is micro in nature, decentralized policy structure has a number of advantages over centralized policy structure.

Decentralized policy structure, among others: i) creates an enabling environment for the existence of good governances at local level, so that it forces local leader to be accountable and transparent to the people in terms of rainwater development plans and strategies; ii) creates the participation of people in the process of policy formulation, strategy design and planning, which will allow people to voice their interest, demands and preferences of rainwater use, management and development; and iii) provides incentive for people to participate and to committed themselves for the implementation of RWH policies. These and other advantages of decentralized policy structure improve the

social acceptability and feasibility of a rainwater policy. The social acceptability reduces the cost of policy implementation since the cost of compliances and policy enforcement will be minimal. Feasibility (economic, social, political and environmental) on the other hand has a direct implication on the achievements of planned targets (RWH promotions and development plans) and the performances (economic, social, financial, institutional and physical) of introduced RWH technologies. Therefore, decentralized policy structure is effective because it minimizes cost of policy implementation; and it is efficient because it allows achieving the targeted development plans and targeted technology performances.

Surprisingly, the above analysis justifies that all stakeholders including government are concerned with the different angles of the same problem. Some are concerns about the structure of policy and others are concerns about the content of a policy, but basically they are all debated over a single problem that is policy. The dual interpretation of this is that all the debates are a confirmation to the importance of policy, even, the wider gap in perceptions itself is the result of lack of specific and decentralized rainwater policy. Policy as we have seen it above is a central framework that shapes both the structure and the content of implementation and political commitment. Hence, in the absence of policy, it is unnecessary, even undesirable, to debate over crisis of a resources management. Thus, we can generalize that the root of a resource management crisis is lack of specified and decentralized structure policy; the other problems are the by-products of the process of policy formulation and implementation, which can be shaped and managed at any time in accordance with the policy framework.

Nevertheless, the optimal choice on the degree of specification and decentralization of a resources policy has to take into account both the gain and the cost of policy specification and decentralization. The gain can depend on the nature and the value of a resource to the national economy. One cannot expect the same degree of policy specification and decentralization for petroleum and water. For instance, for petroleum we might need high degree of policy specification that clarify the rights and obligations of petroleum use and management, but it has to be supported by highly centralized policy structure. This is because; decentralization of petroleum (high value resource) management policy can create inequality between regions of a country unless it is managed by the central government. On the other hand, policy specification and decentralization brings quite a number of changes on utilization, management and development of a resource and also on institutions, legislations, technologies of use, budget allocation and so forth. These changes, on the other hand, can bring both unintended and intended social, economic, political and environmental implications over the use and management of a resource. Thus, before any resource policy recommendation, one has to critically examine the net gains from a resource policy. In the coming section, we try to examine the added value of rainwater policy specification and decentralization on the use, management and promotion of RWH technologies.

What Policy Gaps and Implications did the Policy Research find out?

Generally, Ethiopia has different water related general and sectoral policies that are designed to address the sectoral demand of water through integrating the different sources with the intension that these policies can manage the different sources of water in a similar fashion. All the existing policies developed at federal level within the mandate of the respected federal Ministries. So far, there is no policy developed at regional level as far as water is concerned. Accordingly, the federal Ministries "in consultation with the respective regional bureaus" compile most water development strategies and plans. Thus, the regional states have to work within the framework of the federal policies, strategies and plans. These policies are, therefore, characterized by centralized structure and non-source specific in content; the policy gaps have to be examined accordingly. For instance, the only rainwater specific statement that one can find throughout the policy document is the general policy objective No.15, which states as:

> Promote and enhance traditional and localized water harvesting techniques in view of the advantages provided by the schemes' dependence on local resources and indigenous resources.

And one statement in the document of implementation strategy

> Emphasis will be given to water harvesting methods to enhance small scale irrigation development in areas where wet season runoff can be stored and used for food production through constructing dams based on seasonal runoff

Now, the question is: are these centralized structure and no-source specific water policies sufficient enough for RWH to play its vital roles and to manage rainwater resources and technology management crisis? In other words, does specification and decentralization of rainwater policy could lead to positive overall performance gain in RWH? Answering this question demands to understand the implications of policy gaps (lack of rainwater specific policies and decentralized policy structure) on the overall performance of rainwater resources and technology use, management and promotion. However, due to lack of empirical data on cost and benefits of rainwater policy, the analysis is limited to examine policy gaps and their implications, rather than calculating the net gain from policy. Moreover, lack of different policies structures in the country does not allow us to disentangle the gain from policy specification from policy decentralization. This has urged to use policy content as a framework of analysis and policy structure as a supporting case for explanation. But, any failure due to lack of incentive and regulation is accounted to policy specification problem, while any failure due to inappropriate plans, inappropriate strategies and infeasibility of RWH technologies to the local context is considered as structural problem of a policy. Below, six major policy components are identified to examine the detail of the policy gaps and their implications. These are: environmental, legislation, economic, technological, institutional and social component, which are discussed in a separate sub-section.

Environmental Component of a Rainwater Policy

Environmental component of rainwater policy is supposed to addressing sustainable use of rainwater through influencing the water conservation, utilization, protection and development action and behavior of users towards the preset standard quality and quantity. In this regard, the soundness of a rainwater policy from its environmental aspect is identified to be measured by the existence of policies related to: i) abstraction control (limit of quantity of utilization); ii) water quality control (standard of qualities); and iii) pollution control. These restrictions are believed to influence the behavior and action of rainwater users and use systems, which could reduce over extraction or over use of rainwater; and improves the equity and sustainability of water use among users and systems. A water policy that misses one or more of these restrictions on the use of rainwater would lead to poor achievements of environmental conservation efforts, unsustainable use of water, and imposition of use externalities.

Poor achievements of environmental conservation efforts- there are a number of evidences that support soil erosion or land degradation in the high land parts of the country is the result of high concentration of rainfall, reaching annually up to 2200mm. To curb the problem of soil erosion, a lot of soil and water conservation program have been designed both by the government and NGOs; quite a lot of soil conservation techniques and methods have been introduced across the country; a number of soil and water conservation researches have been conducted, workshops were organized and recommendations forwarded at different levels. Despite all these efforts, the achievements are far less than what had been expected. Soil erosion and land degradation is still one of the critical problems, especially in the highland parts of the country. The country water policy stresses on the importance of basin watershed management approach. However, it is believed that micro level intervention is an appropriate strategy for RWH since it protects the land from degradation, the water from wastage. For this to happen, it entails the adoption of household-

level catchments approaches and micro catchments watershed administration, which is not the case.

Unsustainable use of water resources: - lack of rainwater specific policy that setout appropriate strategies and plans for unsustainable use of rainwater has reduced sustainability of water uses. In rainwater harvesting, the main interest is on the surface runoff which is the portion of rainfall that runs into rivers and finally into lakes and Oceans. The other part of rainfall is used for groundwater recharge, transpiration, and root zone of plants. Therefore, rainwater as a mother sources is the base to maintain the hydrological cycle of water, sustainability of water use. For instance, the water and soil conservation strategies adopted so far are not user and rainwater centered, rather they are land centered. The approaches have been giving little attention, if any, to the opportunity benefit of rainwater. In those approaches rainwater is considered a threat (cause of soil erosion), which has discouraged conservation of water in different forms. Today, those areas have been suffering from physical scarcity of water due to lack of ground and surface water potentials.

Encourage imposing environmental externalities: – lack of limit on the abstraction of rainwater, which has resulted in lack of clear rights and obligations on run-off, has resulted in conflict over resource use that the upper catchments owner imposes externalities (over flooding or pollution or appropriation externalities) on down catchments user. For instance, provision externalities, upper users imposition of flood on down stream user, is common in Amhara regional state; and appropriation externalities, head users appropriation of more water against end users, is also a common problem in Tigray regional state.

In conclusion, RWH friendly environmental policy should: define the rainwater abstraction quantity and quality rights and obligations of users; define rules and regulation that governs the limit of abstraction in environmental friendly ways; clarify the implications of micro level watershed management administration; clarify the rights and obligations of user's watershed management; and clarify catchments rights and put an obligation on the owner to bear the cost of damages created by inappropriate management of his catchments runoff. In other words, the environmental policy of rainwater harvesting should stress on the definition of rainfall catchments rights (abstraction and quality rights) and obligations (abstraction limits, pollution levels and quality standard) based on environmental friendly criteria.

Legislative Component of Rainwater Policy

It is observed that rights over different attributes of rainwater and security of those rights have a significant influence to the management of rainwater resources and technologies. The two most important resource rights that hindered the management of rainwater resources and technologies are identified to be land and water rights. These rights hinder the performances of RWH through influencing the soil and water conservation behavior and action of resource users; the adoption of new technologies, techniques and practices of rainwater harvesting; and the incentive to invest on land and water resources.

Water rights Vs Rainwater Harvesting

In Ethiopia water is the common property of all Ethiopians, and all citizens have the right to get access to water based on the rules and regulation of the government (MoWR, 2000). There are a lot of communally owned rainwater harvesting structures in the country, most of which are performing very poorly due to lack of timely maintenance and operation. Most scholars argue that the level of community participation determines the success of communal water conservation structure. In Ethiopia some actors including the government, participate and mobilize the community resources at all stages of the project so as to create a sense of ownership. Not only that they also hand over the final rainwater harvesting project formally to the community. With all these processes, the success is not attractive and researchers still recommend the continuous follow up of rainwater harvesting structures by

the responsible government organs. We argue here that it is not participation per se that determines the success of RWH, but rather, the involvement of end users at all stages of the projects. Community involvement, however, requires enabling policy environment that enhance collective action. Water tenure system is one of such policy instruments that enhance community involvement for collective action. Moreover, security of the water tenure system enhances the adoption of new rainwater harvesting technologies, methods and improved soil and water conservation practices and the willingness of resources users to invest in RWH, be it in the form of capital, labor or material.

Our field observation has also confirmed this fact. In Tigray, Amhara and Oromiya regions we have observed that clear definition of communal rights, individual rights with in the group and complete devolution of water management power to end users has improved performances of RWH technologies. It is observed that appropriate right should not be limited to water and the physical structures of the rainwater, but it has to also include the right of making decision at all stage of the project. The RWH rights have to be catchments right, i.e., right should be inclusive of land, water, vegetation, rights of the rainwater catchments in question. The other non- resources rights should also include the right to determine crop and method of cultivation; the right to determine the techniques, methods, technologies and practices of water harvesting; the right to protect the land against conversion to other uses, the right to determine the type of land use, method and practices of soil conservation activities, the right to determine the method and finance of rainwater harvesting structures, the right to determine the use of harvested rainwater and inter sectoral transfer.

It is also observed that the traditional communal schemes have shown better performance and sustainability of physical structures (operation and maintenance of scheme are done on time) as compared to government initiated projects. The discussion we had with the communities of communal RWH users revealed that the communities does not feel a sense of ownership at all. But, they had contributed resources and labor because of government mobilization; they might call such contribution. In some areas like Fogerra district of the Amhara regional state, community members are not willing to use the structures. They rather feel that RWH structures are sources of health problem due to health officials' awareness raising. They even attached it to famine (bad luck to the future) since its promotion is attached to food security intervention with food security budget donated by aid agencies. As a result, the community felt that RWH structures are donors and/or state property and, therefore, they should be responsible for maintenance and operation. The community felt that they are only responsible to report the problems to owners (DAs or other government officials). In those areas, community awareness raising and water right clarification might be priority policy issues, before any project intervention. It is observed that the size and homogeneity of groups and capacity of leadership plays a significant role for the success of communally managed RWH structures. In the case of private RWH structures, however, land transferability right, price of water from other sources, expected benefits from rainwater and level of government intervention determine the willingness of individuals to invest for maintenance and operation of the rainwater harvesting structure.

Land rights Vs Rainwater Harvesting

RWH not only requires transparent water right but also transparent individual and communal land tenure systems. Land tenure is a system of land ownership governed by the land law and land policies. In Ethiopia land belongs to the state and citizens. The user has the right to use the land for an indefinite time. Since rainwater harvesting involves long-term investment and the user requires a tenure system. For instance, rainwater-harvesting structures owned by private owners have shown better performance than the communal ones. This is because in the case of private RWH structures, the owners have the right to exclude outsiders and the ability to reap the benefit of labor and capital invested for rainwater collection either through sale or direct use. However, lack of transferability right of land in the form of mortgage, sell and collateral has affected the

adoption of rainwater technology in three ways. First, restriction on transferability of land in those forms (mortgage, sale and collateral) reduces the incentive of farms to adopt land-based water harvesting technologies. For example, farmers in Awe zone of Amhara region are not willing to have private rainwater harvesting structure in areas, which are far from their residence places. This is because; they feel that land nearer to the homestead is the most secured area that is not affected by future land reallocation. Second, restriction on market transferability of land reduces market exchange of land and also investment values on land including rainwater-harvesting technology since its transferability right is attached to land. Third, restriction on transferability of land reduces the possibility of using rainwater-harvesting structure as collateral to get access to capital. Rainwater harvesting structures can be used as important collateral assets. However, it has value to potential lenders only if the owner is able to transfer his right to the lender to the extent that it can be sold to third parties, in case of default. Thus, what is important is not the ownership of land per se, but rather it is the completeness (the existence of the three dimensions of land property rights) and quality (divisibility of rights) of land rights that determine the success of adopting rainwater technology, techniques and new water conservation practices.

Land right also affects the distribution of water. For instance, in Tigray region use of runoff from communal land exacerbates conflict, whereas in Amhara region, upper users' imposition of externalities (over flooding) on down stream catchment users is becoming the main sources of conflict. Both of them need to be tackled through incentive and/or deterrent policy measures. The problem with communal land right is very severe since users have no complete exclusion right leave alone the transferability and security right dimensions of a property right. This has reduced the incentive of individual user's collective action towards the development of rainwater structures. That is why in most of the cases the communal rainwater harvesting structures are initiated by external entities be it government or NGOs. This has resulted in low social, economic, physical and financial performances on communally owned rainwater-harvesting structures. The external actors have also ignored the policy variables and they are focusing on technical feasibility of structures. However, field experiences tell us that how technology might be feasible and sound; enabling policy variables, which determine the nature and quality of water and land rights, influences the adoption. The above facts imply that RWH requires investment on land in the form of watershed management or soil and water conservation, which demands a clear land policy. Clear land policy is an important policy measure in the country for both optimal and sustainable use of the land and water resources.

To sum up, the above analysis provides strong evidence that unclear definitions and uncertainty in rainwater laws is a critical limiting factor to achieve a sustainable and efficient use of rainwater resources and technologies. Therefore, a sound rainwater policy is required to justify the need of legislation on water rights, distribution and utilization, and means of how to secure those rights. It should clarify: i) entitlement and responsibility of users; ii) the role of state and other stakeholders; iii) the process of water allocation within and between sectors and users; iv) the legal status of various rainwater user group; and v) sustainability of RWH use. It should further address questions like: i) who is bearing unwanted cost? ii) What is the prevailing institutional set up (or rights structure) that allows this situation to persist? iii) Who must bear the transaction costs necessary to resolve the situation? and iv) who gains and losses by this particular resolution of the problem? Legislative component of a water policy defines the legal environment (laws and regulations), which is required to regulate the water distribution among sectors and users at specific time, amount and space.

Economic Components of Rainwater Policy

It is recognized that rainwater has a paramount potential to reduce the current level of water scarcity. However, it might be surprising that rainwater and rainwater technologies are the most poorly managed resources in the country

mainly due to the provision of inappropriate subsidy both to rainwater and other water supply sub sectors.

Inappropriate Subsidy to Promote RWH

Ethiopia has been giving support (subsidy) to promote both the communal and private RWH for the last three years. The support includes free provision of plastic sheets and other related materials. This free provision of supports or subsidies has created a number of social, environmental and economic problems. These include: increase users' dependency on public or state resources, lack of sense of ownership for the property, inefficient use of RWH facilities and irrational use of public budget. These results are the outcomes of lack of appropriate RWH promotion policy and strategy that governs the provision, monitoring and evaluation of supports. Such kind of capacity building efforts (subsidies) does not improve the efficiency and effectiveness of rainwater resources management. This is because the subsidy efforts do not take into account the capacity that the local people already have. This is called "blanket" subsidy approach, meaning the same type and level of subsidy is given for all communities regardless of their initial potentials (skill, resources, services, experience, and technology) accumulated throughout their life. A subsidy system that takes into account the existing local potentials is called "thresholds subsidy". The central approach of this subsidy is to fill the resources, technology, skill and experiences gaps that allow users to sustain the provision of water services. Hence, the amount of RWH subsidy shall be determined based on three key factors: i) the level of capacity already available with in the community or resources user; ii) the amount of water required to get access to the different services of water based on some standard criteria; and iii) the type of technology chosen for RWH. This definitely requires estimating the standard water demand of water user; and assessing the capacity and the willingness of the user to get access to the different services of water. Once we know the water demand and capacity of the user, the next step is to search for appropriate RWH technologies that satisfy the water demand of an individual water user or a group.

Inappropriate Subsidy to Other Water Supply Sectors

Even though, the national water policy encourages efficient utilization of water for higher economic and social values, but most components of the water sector are still operated with subsidy for social reasons. All domestic urban (except Mekele town) and rural water supplies are still operating with government subsidies. Similarly, except in few areas of the Amhara regional state, irrigation water is supplied free of charges. The current high government subsidies both for irrigation and domestic supply reduce the value of water. Given the low preference to rainwater, subsidies and free supply of water from other sources, has further reduced the demand of rainwater, which in turn reduces the demand of RWH technologies and efficient use of rainwater resources and structures.

The water sector subsidy has five implications on the economic use and management of rainwater resources and technologies. First, the current low water price for domestic supply both in urban and rural areas, and zero price for irrigation water discourage users to invest in rainwater harvesting structures even under the condition where there is no alternative water sources and the cost of rainwater supply is cheaper than other sources. Second, the low price of water supply has created a negative attitude towards the value of rainwater so that users have no interest to use the already accessed rainwater leave alone saving and conserving it. The evidence from most urban areas of Ethiopia (even water scarce areas like Harer) shows us that rainwater is not considered as a water sources at all.

Third, low water price discourages efficient utilization of water (opportunity cost of water). For instance, water utilization efficiency of users in Fogerra district of the Amhara regional state is different from source to source. Efficiency is very high in the case of pump water users since access to water through pump is costly both in terms of fuel, maintenances, and operation as compared to other water sources. As a result, motor users are the ones who tried to adopt different soil moisture conservation practices and techniques to increase the per unit productivity of land and to

minimize their cost of production so as to compete in the product market. Surprisingly, due to high cost of water supply, motor users in Fogerra are forced to shift their cropping pattern from high market value crops to crops that are not grown up by government subsidized irrigations scheme users. Thus, the government subsidy of irrigation scheme (low price of irrigation water supply) reduces the market competition of farmers who invest money and labor on water including rainwater harvesting.

Fourth, low price of water discourages the adoption of new rainwater harvesting techniques, methods and practices. In most area of the country, users are reluctant to adopt new water conservation and rainwater harvesting structures due to the fact that government supply of water is by far cheaper than accessing water through the adoption of new technologies and method of water conservation. As a result, the most critical source of conflict in Amhara region as far as rainwater is concerned is the upper users' imposition of flood on down stream users. This is because users have no interest to invest money, time and labor in harvesting rainwater even if there is high scarcity of water. Since government supplies water in nearby areas with zero or very low price, they prefer to have the same support rather than finding their own means like rainwater harvesting.

Fifth, the low price of water reduces the incentive of private sector to involve in the supply of the different services of water for users including rainwater harvesting. From this, one can safely conclude that high government subsidy of the water sector reduces the value of rainwater, the adoption of new technology, incentive for investment and efficient utilization of rainwater.

The above facts indicate that how RWH is uniquely affected by water economic policy and how it is sensitive to allocation of other water sources. This is because decision on rainwater use requires taking into account other several economic variables. Generally, it is observed that other sectors water subsidy is a cause for rainwater water use inefficiency. Thus, improving efficiency of rainwater use urges to introduce appropriate water price to other water supply sectors.

Institutional Component of Rainwater Policy

Institutions involved in the rainwater sub sector and the framework of rules within which they operate are so critical to the achievement of RWH vision, plans and targets. In this regard, institutional aspect of rainwater policy has provided a framework and context for private, public, NGOs, community and individual users' role in the conservation, management, development, protection, and utilization of RWH. It has also reflected the capacity implications of the policy at different levels in terms of manpower, research and information so as to implement the intended policy targets.

Ethiopia is very much known in institutional revolution. In the history of Ethiopia, intuitional reform is always associated with the emergence of a new state administration. Water institutions are not free from such type of new state oriented reform. "Water Resources Department under the Ministry of public works" was the first water institution established in 1956. The current government also undertook water sector reform to fit into the national free- market economic policy and political system of decentralization. Accordingly, proclamation No.197/2000 grants power to the "Ministry of Water Resources" to allocate and appropriate water to all regions regardless of the origin and location of sources. It is a regulatory organ responsible for the regulation of water resources of the country. According to the MoWR (2002), Environmental Protection Authority (EPA), Ethiopian Electric Power Corporation (EEPCo), Ethiopian Electric Power Authority (EEPA), Ministry of Works and Urban Development (MWUD), Ministry of Health, the Water Supply and Sewerage Authority of Addis Ababa; and the Addis Ababa Municipality are directly or indirectly involved in the management of water resources at federal level. Recently, the Ministry of Agriculture and Rural Development took the responsibility to supervise small-scale irrigation and rainwater harvesting.

Proclamation No.41/1993 also vested power to regional states that include small-scale hydropower. They are responsible to: i) supervise the implementation of water quality standards for different services; ii) supervise the balanced distribution and utilization of region's water resources; iii) ensure the implementation of laws, regulations and directives issued in relation to the protection and utilization of water in the region. Accordingly, most regional governments have established water resources development bureaus. Some regions like Amhara, Tigray, SNNP and Oromiya have established specialized institutions such as water work construction enterprises, commission for sustainable agriculture and environmental rehabilitation like SNNP, Amhara and Tigray; and/or irrigation authorities like Oromiya.

With regards to rainwater, initially it was not as such recognized as water source at federal level. It was treated under soil and water conservation packages through the Ministry of Agriculture (food for work programmes for instance) and its respective regional agricultural bureaus until today; and natural resources development bureaus in 1989. The revision of the country's food security strategy (the inclusion of rainwater harvesting) was a breakthrough event for the taking up of rainwater issues into the agenda of policy makers. From this time onwards, the agenda of water harvesting has been raised in the name of food security for the last three years both at regional and federal levels. Recently, the Ministry of Agriculture and Rural Development established a separate department responsible for rainwater harvesting. Similarly, regional states have been using different organizational structure to promote RWH and they have undergone a number of intuitional reforms. The reform is still going on in most regional states. For instance, in Amhara regional sate, rainwater has been constantly handled by the Bureau of Agriculture and Rural Development. While in Oromiya it was managed by Irrigation Development Authority in the past, but recently it has been under the Bureau of Agriculture and Rural Development. The case of SNPP is similar to Oromiya. In Tigray the Bureau of Water Resources has implemented it. Institutional environment, users' management and institutional capacity building are identified as the three major institutional policy constraints to the promotion of RWH.

Institutional environment- defines mandate of actors, which clarify the roles, responsibilities, and authority of actors. Specially, in the regional states there are so many actors including NGOs, environmental protection bureaus, water bureaus, rural development and agricultural bureaus, health bureaus, land authority and others, which have different concerns (even some times opposite concern) in the management of rainwater. However, all this actors lack clearly defined roles, responsibilities and authorities. It means there are no clearly defined framework, rules and regulations that govern the interaction, communication, planning and coordination of implementations. According to regional bureau officers, lack of this clarity hinders the promotion of RWH by: i) reducing the incentive for coordination of efforts and resources; ii) increasing conflict over roles due to confusion of roles and responsibilities; iii) hindering experience sharing on best practices; iv) reducing the level of community participation, and ignoring indigenous water management institutions and local experiences; v) reducing the sustainability of efforts, continuity of activities and efficiency of implementation; vi) reducing accountability and transparency of end users; and vii) increasing roles promoting contradictory approaches; viii) increasing institutional instability, which has created job insecurity; and x) reducing clarity between the roles and responsibilities of federal bureau and regional states.

Users` management: – in the national water management policy stresses decentralization as devolution of resource management power to regional states. But, rainwater requires absolute decentralization up to end users since most of the policy concerns of RWH are micro by their nature than as stated in the national policy. Decentralization of rainwater management, therefore, requires complete devolution of rainwater catchments to end users including catchments user right, exclusion right, management right, resources mobilization right, right of selecting services and service providers and right of institutional self determination.

Moreover, the management rights has to be as comprehensive as possible, it include rights over other resources of the catchments such as land, forest and wildlife of the catchments. Lack of rainwater friendly complete and comprehensive decentralization has resulted in lack of incentive for collective management, investment and sense of responsibility, which in turn resulted in poor maintenance and operation of communal rainwater structures and conflict over the use of rainwater and RWH structures. The current population centered local government administrations further hinders the promotion of communal RWH. This is due to the fact that RWH demands to have rainwater centered (micro level watershed) administration rather than structures like "kebele", "gott" and "cell" (in the case of Amhara region for example).

Capacity building: - The national management policy also stresses on the need for enhancing the capacity of regional states. Unlike other sub sectors of water, RWH as new area of intervention might require special attention in improving the capacity of stakeholders at different levels beginning from public awareness raising. Lack of rainwater specific policy in this regard made RWH deserves little attention in all aspects of capacity building (research, information and human development) as compared to other water sources like rivers, groundwater and lakes for three reasons. Even the accomplished ones are either inappropriate or unsustainable for three reasons. First, its role was recognized very recently in the name of food security and hence its role is limited to drought mitigation. Second, instability of implementing organs, especially at regional levels has increased due to reshuffling and staffs turnover. Third, lack of awareness on the value of rainwater at all levels discourages many people from working on RWH. That is why the failure of most RWH structures is associated with technical problems due to lack of skill in installation, design and site selection at all levels.

Therefore, clarification on institutional issues believed to enhance the participation of all stakeholders; avoid confusion of roles and responsibilities to reduce duplication of efforts; enhance coordination of efforts and resources; improve capacity and effectiveness of services provision; and clarify the rights and obligations of users in the resources management.

Technological Component of Rainwater Policy

Technology, here, refers to rainwater storage technologies in situations where water is needed to be stored for different purposes like for flood control, domestic supply, irrigation, etc. The choice of a storage systems is determined by a number of local conditions such as amount of water storage required; type and size of catchments; rainfall amount and distribution, soil type and permeability; availability and cost of construction materials; affordability; local skills and experiences and availability of other water sources. The three important technological policy constraints of RWH are: financing technology, managing technological externalities and technology quality control. A policy addressing these concerns means: reducing externalities associated with RWH technologies such as health hazards and water losses; improving quality of technologies in term of social, economic and environmental acceptability; and enhancing financial sustainability of technologies.

Technology failure due to technical problems

Recently, Ethiopia has introduced a number of rainwater harvesting technologies from different corners of the world and there is no empirical evidence that clearly indicates one type of technology is better than the other. Even the type of technologies already introduced in the country is not certainly known. However, some preliminary studies indicate that the performance of most of the adopted rainwater harvesting structures area not achieving their intended objectives due to technical, environmental and hydrological reasons. As most engineers argue it is true that the choice of the technologies is site specific because its success is determined by a number of area specific variables like soil type, land characteristics, rainfall availability and variability and other area specific variables. On the other hand, rainwater-harvesting

technologies introduced from countries of more or less similar environmental and economic conditions are not successful as intended to be. Moreover, we have observed successes and failures of the same technologies introduced under similar ecological, technical and hydrological conditions due to the difference in the socio-economic characteristics of the user, especially in the case of privately owned structures.

The dual interpretation of this is that the choice of a technology is also influenced by the ability to afford and the willingness of the decision maker to buy the technology or to invest for operation and maintenances. This could also be influenced by policy incentives. Thus, we argue that the choice of the technology is not only determined by technical, social, economical and topographical factors but also by policy variables, which are mostly ignored by researchers. These include incentive policies such as different forms of subsidies, which encourage users to invest in and adopt new RWH technologies, and techniques. On the other hand, deterrent policies such as taxation would discourage users from misusing RWH structures and impose technology externalities. Generally, technology policies that enhance user's investment on RWH technologies, reduce problems related with rainwater storage facilities such as cost, siltation, evaporation, seepages and health hazards; protect the technology from external damage; protect users' right to determine the choice of technologies; and encourage the use of other storage facilities constructed for different purposes such as road, water channel, railway, etc are areas of RWH policy interventions that demand the attentions of policy markers.

There are some policies in this regard, but they give more weigh to the adoption of new, labor intensive and indigenous technologies as stated in the rural development and agriculture policy. These policies are not sufficient to successfully promote RWH. It requires additional policy intervention or clarification in the area of technology externalities, technology financing conditions and quality control of technologies. This will minimize the social cost of RWH technology adoption. Therefore, RWH related technological policies shall be policies that provide incentive both to end users and other actors to invest on economically sound, socially acceptable and environmentally friendly RWH technologies. Since all technologies are not appropriate for all users at all times and places (one shoes can not fit all), a RWH policy shall answer the question as to when and where RWH technology will be appropriate.

Equity /Social Component of a Rainwater Policy

Equity in water allocation refers to fairness with respect to distribution of costs and benefits of a resource among individual or group users, systems and regions. Inequitable allocation of water could be natural (due to uneven distribution of resources) and /or project oriented like the introduction of RWH technologies. The most important inequity of RWH projects can be manifested in 5 ways. These are: i) income inequality- income disparity created due to the project; ii) gender inequality- unequal treatment of the voice and the choice of men and women in the project designing, implementation; and distribution of the cost and the benefits of the project; iii) inequality of upper and downstream users – resulting from externalities of the project (when the upper stream project user imposes externality on downstream user); iv) cattle raiser and farmer inequality – when cattle damage the RWH structure of the farmer or the health hazard of cattle affects the RWH farmer; and v) generation inequity- resulting in over abstraction of rainwater without taking into account the hydrological cycle of water and ground water discharge role.

The national water management policy addresses some key issues of water appropriation. The addressed policy issues are more focusing on improving the initial water inequalities created due to uneven distribution of the natural water sources, mainly to improve the inequity of water allocation among regional states. However, implementation of water projects by itself can also create inequalities; inequalities result from unequal distribution of costs and benefits of a project between poor and rich, current and future generation, pastoralists and agriculturalists, upper stream users and

downstream users, men and women. This would create income disparity, externality, conflict and degradation of the water resources. Thus, policy should also highlight a framework that will urge a project planner to take in to account all those concerns. The following examples can help to examine the important of rainwater specific policies to minimize inequalities.

Regional Water Supply Inequality

Lack of region rainwater specific might be one of the causes for the aggravation of regional water allocation inequities. As it is known, the national water potential is distributed unevenly and mismatch with the settlement of the population. It is estimated that only 30% to 40% of the population is settled in area where 80% to 90% of the water sources are found. On the other hand, more than 60% of the population is settled in areas where only 10% to 20% of the water sources are found (MoWR, 2000). This definitely requires either to transport water from water surplus regions to water deficit regions and/ or looking for other supply options like rainwater harvesting to provide the different service of water a least at basic survivable level leave alone equity. However, with the current national capacity and uneven distribution of the water resources, addressing the issues of equity using the current approach of focusing on ground water is unthinkable, especially in those areas where population is highly dispersed and has limited access to other alternative water sources. In this situation, RWH technology has paramount role to address regional water distribution inequalities. However, due to lack of rainwater specific policy that provides appropriate region specific incentives and strategies hinder the promotion of RWH technologies in moisture stress area. Contrary to the actual fact, better RWH promotion efforts have been put in those areas where there is alternative source of water. But, the availability of alternative options and low price of water supply from other sources reduces the acceptance of RWH technologies in those areas, but rather, it increases the degree of water allocation inequalities between regions. Take for example, the price of water per truckload, which ranges from Birr 500 to 800 in Afar region, and people who are not able to afford this price that is used to travel 15 to 20 km to fetch water for domestic consumption (MoWR, 2002). Surprisingly, the efforts to promote RWH are very minimal in those areas, even; attempts are unsuccessful, due to lack of appropriate policy incentives to individuals and groups to invest on RWH technologies.

Income Inequality between Users

Government has been promoting private RWH technologies more than communal for reasons of divisibility and addressing household level food security. The high cost of rainwater structures, however, increases the disparity of water allocation between the poor and the rich people. In most of the cases, the rich, the one who able to afford the privately owned rainwater harvesting structure, while the poor are forced to buy water at relatively high price. This is mainly due to lack of appropriate RWH micro financing policy that addresses the interest of the poor. Existing micro financing institutions are becoming profit oriented and demand group guarantee, which excludes the poor and marginalized group since group members are not willing to take responsibility for the poor. This further exacerbates the income gap between the poor and rich due to the fact that the poor have been denied access to water for production.

Sectoral Water Supply Inequality

Lack of sectoral rainwater use policy and strategy also increases the inequality of rainwater allocation among sectors. Rainwater has significant contribution in all water demanding sectors. However, except the agricultural sector (food security), the other sectors give very little attention, if any, to RWH. Others consider it as a threat to their sectoral development like health and environment. This undermines the potential roles that rainwater can play and reduces the true economic value (opportunity cost) of rainwater. Thus, maximization of rainwater opportunities entails the creation of enabling policy environments that enhance the maximization of rainwater opportunities to the sector in question.

Other Inequalities

The other misleading concept in the policy document is the issues of gender. Gender does not refer to only women. By definition it refers to the qualitative and independent character of women and men's position in the society. Therefore, equal attention need to be give for both sexes in terms of incorporating their voices and choices in all stages of the project. The other policy element, which is ignored by the national water resources management policy, is management of externalities created due to the use or over use of water resources. Moreover, given water is a scarce resource, equity of RWH benefits should take in to account efficiency of rainwater uses (economic aspect). This means a rainwater policy should also keep the balance between efficiency and equity of rainwater use. This is especially important for rainwater resources management, which exhibits tradeoffs between efficiency and equity.

Summary

Generally, centralized and non-source specific policies do not fit to manage all water sources in a similar fashion due to the difference in the nature of sources, which determine the technical, environmental, social, economic and political feasibilities of a water source in question. This means that different water sources require different policies due to the need to use different strategies, technologies, institutions, legislations, and environmental regulations. The difference in implications requires to recommend new approaches to administration, new roles for government officials, recognition of multiple stakeholders, new roles for civil society institutions and NGOs, administrative coordination, information sharing and communication, a legal framework, research, capacity building and strong local institutions, so and so forth. Thus, there is strong evidence on the need of rainwater specific and decentralized policy that could address environmental, institutional, technological, legal, social and economic concerns of rainwater resources and technologies; so as resolve the current rainwater resources and technology management crisis and gear rainwater utilization towards the national overall socioeconomic development. Unless some actions are taken, it is very difficult, if not unthinkable, to promote RWH technologies, to smoothly handle the current rainwater resources and technology management crisis, to fully manage externalities of unused potentials, and to fully use the potentials and use opportunities of rainwater for the development of the national economy as it has been expected, using the current general water policy. Thus, this section clearly answer the question of what type of rainwater policy do we need. Now the follow up question would be: To what extent should it be specified and decentralized? We will discuss it in the coming section,.

What Alternative Policy Options Did the Research Propose? Given all the discussion in the above sections the author argues that two levels rainwater specific policy is an ideal policy in the context of Ethiopia (see the detail of the argument from below).

The current integrated sector-based water policy is an overarching framework that was developed based on national demand and supply concept of sectoral uses such as irrigation, hydroelectric power, industry and domestic consumption. This has ignored regional differences in water demand coverage, availability of water sources; development targets and approaches. Similar to the national water policy goal, regions have different development approaches based on their conditions. For instance, different regions have different soil and water conservation, food security, and agricultural production strategies. That means, the water resources management has to be in line with the regions' general development strategies and water demand of different sectors. Moreover, different regions have different water potential with different levels of water constraints. They have also different sources of water, which are more or less sound under different contexts and settings. For instance, rainwater harvesting supply options may be viable for moisture stress areas where there is limited permanent water sources or if supply measures are costly.

On top of that the potentials and constraints of RWH are too area-specific (land, soil, climate

and topography specific) and user specific (livelihood style, economic capacity to afford the technology and culture of user), which necessitates micro-level area, and users centered intervention. The constraint of promoting RWH in one region is not necessarily the same as in other region and this is true of the solution too. Thus, all issues are difficult to be managed by uniform national water management policy.

For this reason, national water policy needs to be supported by region specific water policy so as to address region specific constraints under the framework of the national rainwater policy. In this regard, the two levels RWH specific policy, national RWH specific policy coupled with region specific RWH policies, satisfies both conditions of a quality resource policy (better degree of decentralization and resource specification). The national RWH specific policy could help the country to carefully examine the different roles of RWH in satisfying the different services of water to the national economy, its linkage with other water sources and regional water use implications (hydro politics implications). Region specific rainwater policy is also important to give more attention to the specific requirements of regions, and mitigate area and user specific constraints of RWH promotion.

Unlike other options, two levels rainwater specific water policy is quite important to mitigate the current problems since rainwater specific policy will: i) develop basic rainwater specific utilization, development control and conservation principles at national and regional levels; ii) develop rainwater friendly legislative and institutional reforms, and land policy that fits RWH; iii) clarify the role, responsibility and authority of actors in the promotion of RWH, and right of users in the management, development and utilization of rainwater; iv) give value for the potential role of rainwater to sustain other water sources (linkage with other sources); v) optimally allocate rainwater among users and use systems; vi) improve efficiency and equity of rainwater utilization among users and use systems; and vii) effectively implement RWH specific projects and allow continuity, and coordination of efforts; and vii) identify RWH specific capacities required at different levels such as research, human capital and information.

This will allow rainwater institutions to play their vital role of improving the technical, social, economic, financial and environmental feasibility, and sustainability of rainwater harvesting efforts. It will also enhance the commitment of political leaders and other actors to allocate resources for promoting rainwater harvesting in a sustainable way. Currently, rainwater harvesting is strongly attached with food security policy, which is mostly promoted by donors and external resources like EU, IFAD. Implementation is also quota centered rather than demand driven in most regions of the country. Moreover, policy urges the development of strategic planning for rainwater resource development, protection and utilization, which makes implementation effective, efficient and sustainable. It also encourages water users to conserve rainwater and invest on alternative rainwater harvesting technologies. Generally, two levels RWH specific policy will help us maximize all the opportunities of RWH and fully tackle the aforementioned environmental, economic, social, institutional, legislative and technological constraints of RWH promotion. However, its implementation is so costly since implementation of the policy requires having separate institutional, administration and legislative support both at national and regional levels. In this regard, South Africa is the only country with rainwater specific national water policy in Africa