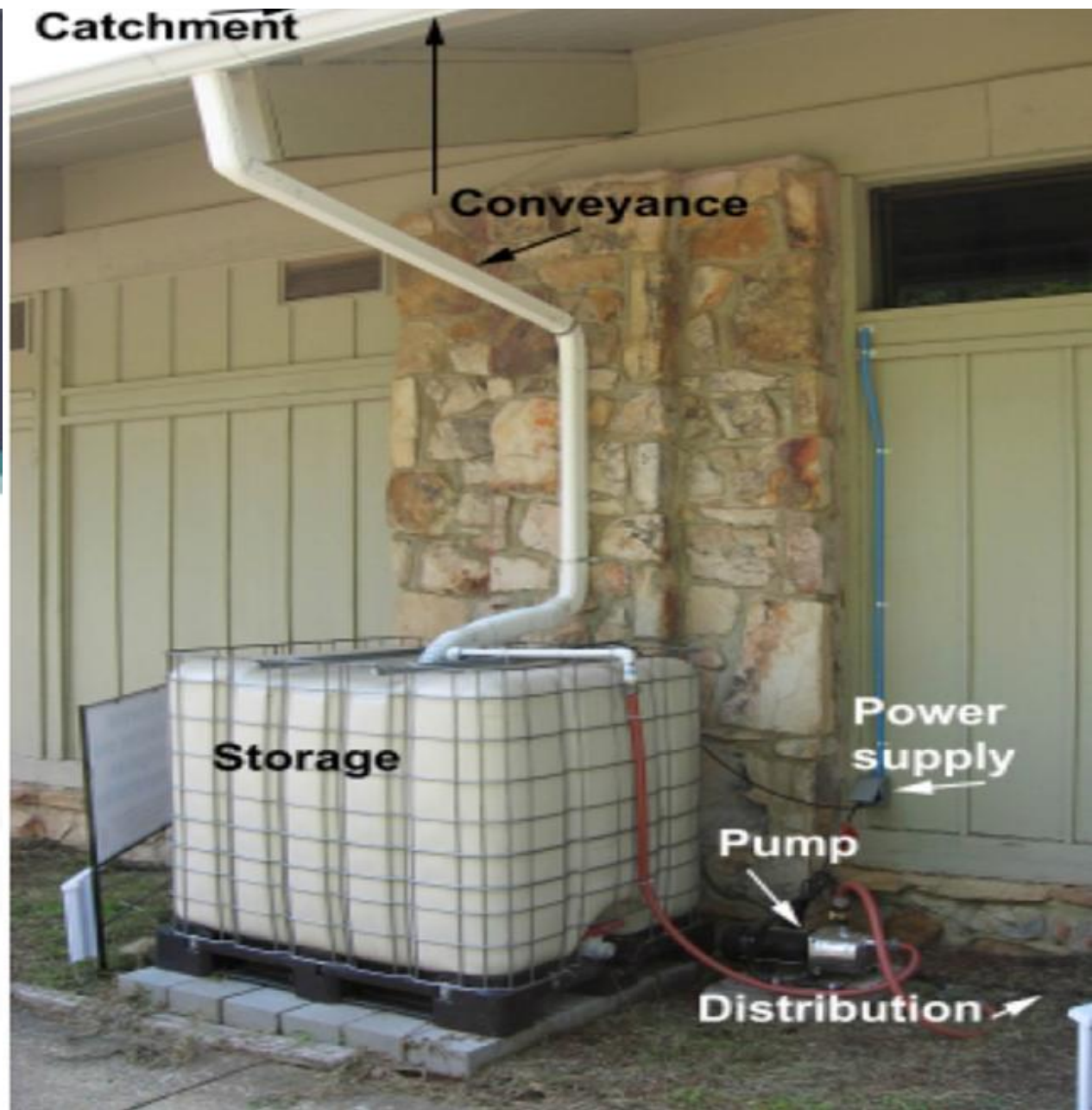
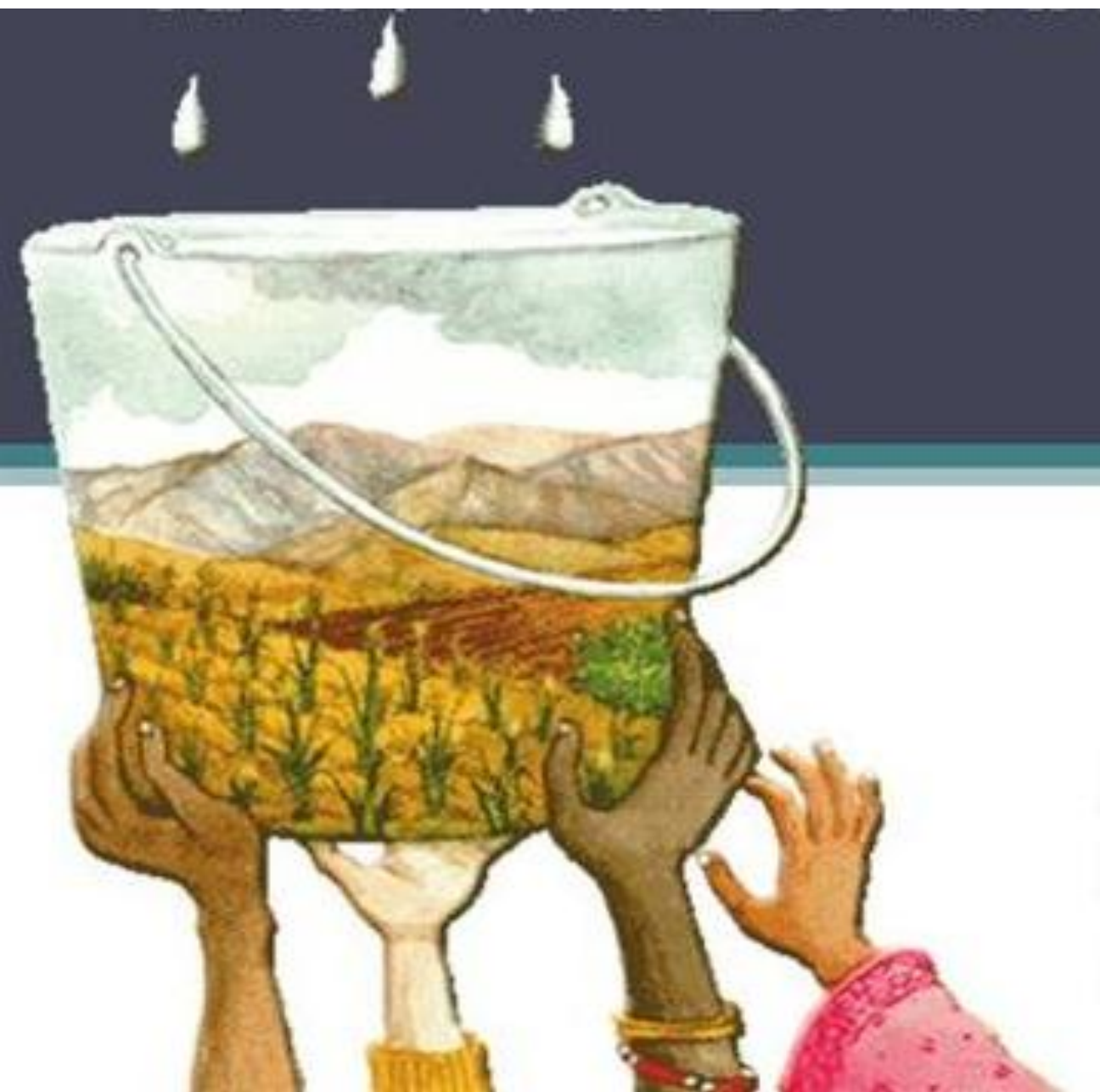




Analysis of political and institutional framework in the field of rainwater harvesting for small-scale irrigation

Presented by

Jonathan Tsoka



Outline of presentation

1. Introduction

2. Rain water harvesting

3. Small-scale Irrigation generators

4. Operation of the rainwater harvesting

5. Economic framework of the rainwater harvesting

6. Political and Institutional Framework

1. Introduction

- Approximately 16.4 million hectares, which is half of Zimbabwe's agricultural land lies in Agro-ecological Regions III, IV and V
- Home to at least 1.2 million households which are nearly half of the country's population
- Encompass the dominant share of smallholder cropping areas
- Regions are characterized by a low and intermittent rainfall
- The large spatial and temporal variations in rainfall, leave farmers with inadequate water to produce more than one crop per year.
- Frequent dry spells and droughts exacerbate the incidence of crop failure and hence food insecurity and poverty.

- Irrigation generally improves farm incomes by enabling a higher cropping intensity and improving the crop quality
- Large-scale irrigation schemes and related technologies are relatively well known and the government already has plans to actively promote these systems
- Some types of small-scale irrigation technologies, especially micro irrigation, are still relatively new in Zimbabwe. Yet they have the potential to enable supplementary irrigation for millions of people and to achieve household food security through home garden micro irrigation, and modest wealth for emerging commercial farmers.
- Rainwater harvesting techniques can be employed as an alternative solution in these regions (III, IV and V) where water supply through conventional methods cannot be arranged or for some reason unsuitable for crop production.

2. Rain water harvesting

Definition:

- Accumulation and deposition of rainwater for use before it reaches the aquifer.
- Collection and concentration of runoff for productive purposes
- e.g. crop, fodder, pasture or tree production, livestock and domestic water supply in arid and semi-arid regions
- **For agricultural purposes:** - a method for inducing, collecting, storing and conserving local surface runoff in arid and semi-arid regions

Importance of RWH

- Reduces the impacts of drought, storm water runoff, and peak flow levels as well as
- Reduces reliance on ground and surface water,
- Lowers non-point source pollution,
- Allows groundwater to recharge
- Promotes water conservation and sustainable practices.

RWH techniques in Irrigation

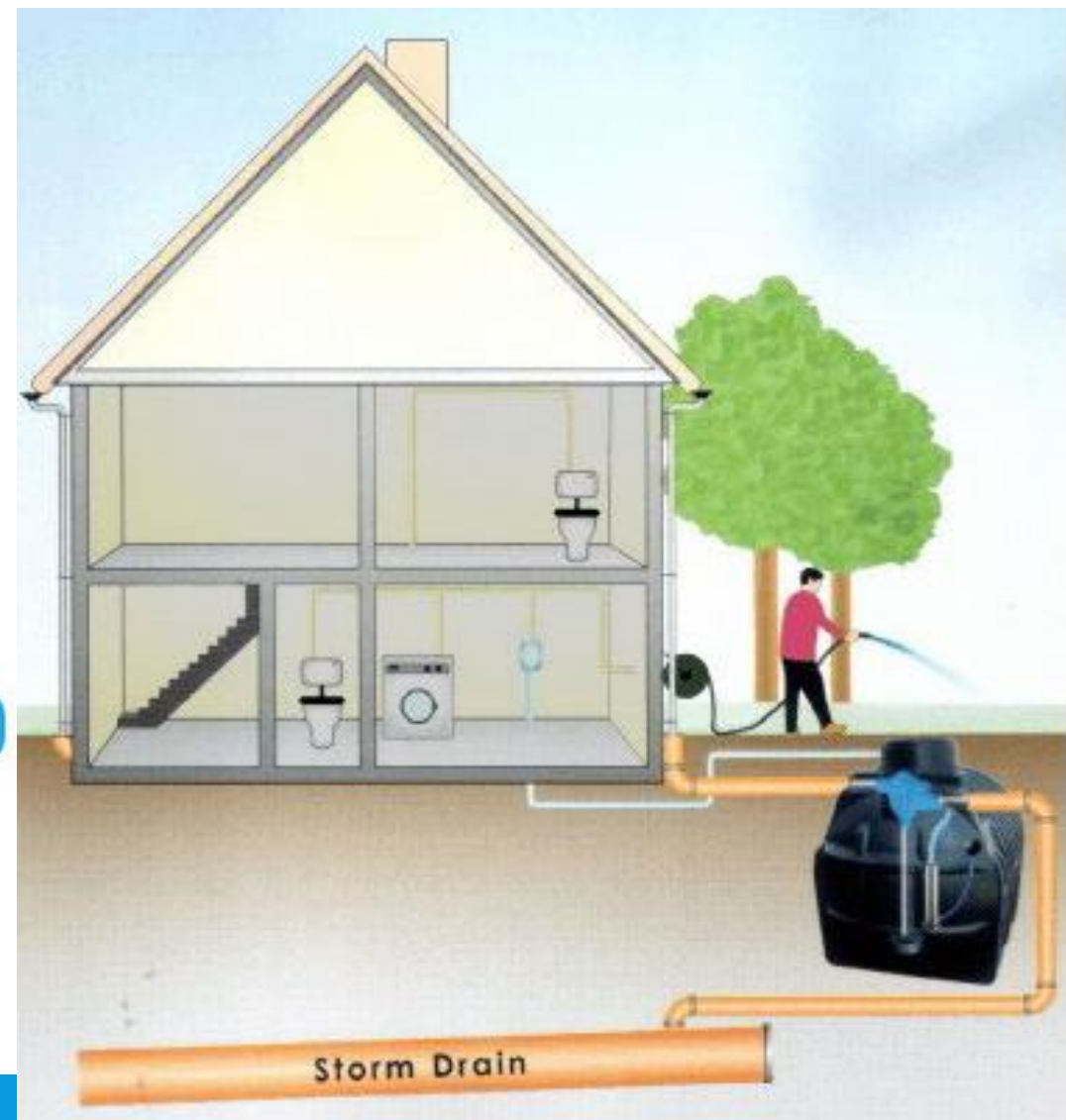
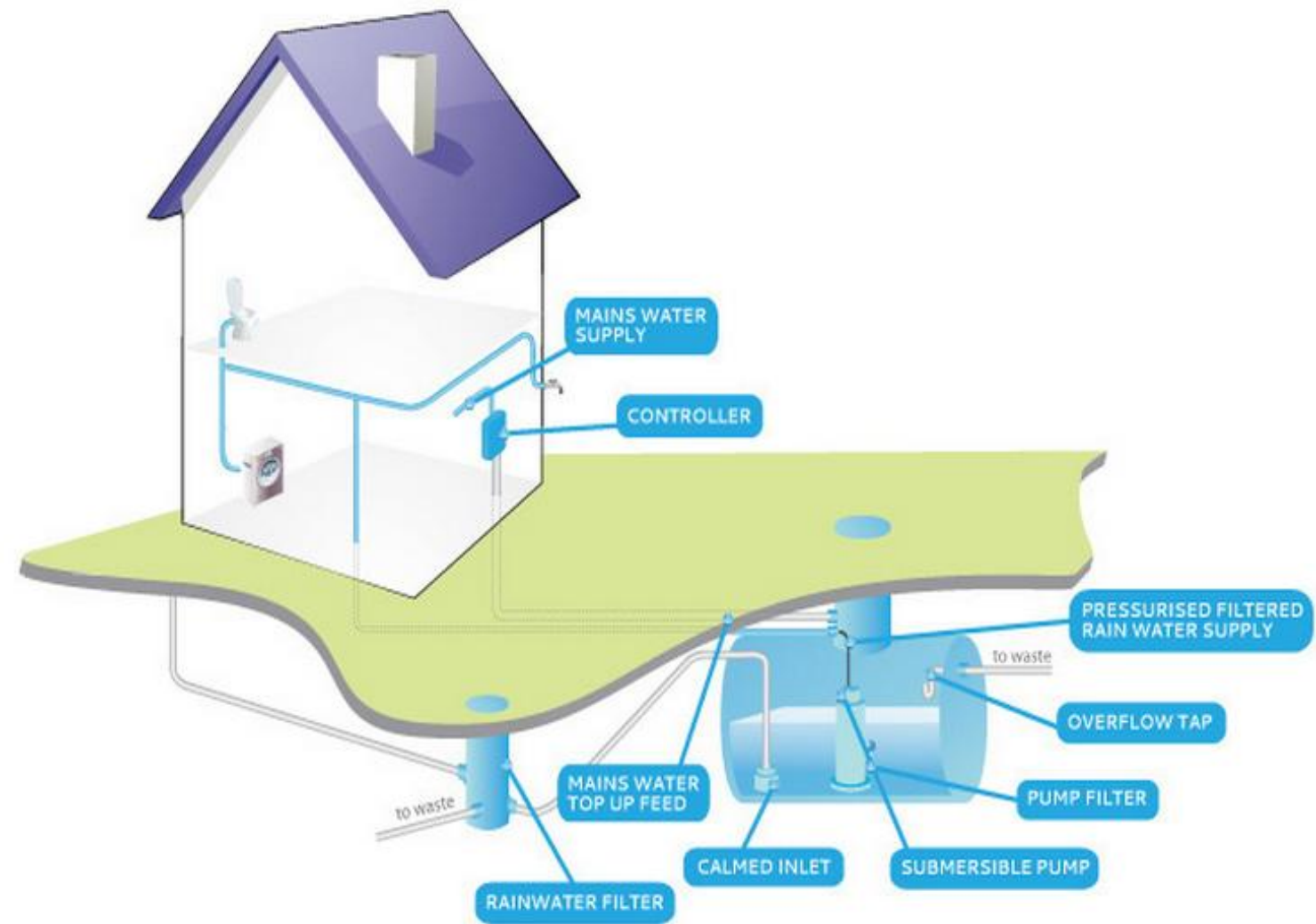
- RWH systems are generally categorized into two; in-situ water conservation practices, small basins, pits, bunds/ridges; and runoff-based systems (catchment and/or storage).
- The storage system is usually used in supplemental irrigation.
- Involve either direct tapping of rainwater in bunded fields or diversion of rainwater run-offs from seasonal and ephemeral rivers.
- Farmers who are irrigating using RWH techniques which divert or ponding rainwater in bunds, suffer from poor infrastructure for diverting harvested water and lack control of water in the bunds.
- They also suffer from unreliable rainfall.
- As a result they are characterized by poor water management and low yields or complete crop failure

3. Small-scale Irrigation generators

- Rainwater harvesting for small scale irrigation can be generated from various catchments which include:
 - Roof-tops
 - Dwalas
 - Dead level contours
 - Sand dams
 - tied ridges, bunds (In situ)
 - Berms (*Integrating rain water harvesting with road infrastructure*)

4. Operation of the rainwater harvesting system

- Rainwater is collected from the roof via guttering and down-spouts. It gravity-feeds through underground drainage pipe and is then passed through a filter before entering the tank.
- Filters can be remote from the rainwater storage tank or can be fitted inside the turret of the tank. The filter removes any leaves or larger particles from the rainwater before it is delivered into the tank.
- This improves the quality of the water being stored in the tank.
- The rainwater enters the tank through a calmed inlet device which prevents any sediment which may build up over long periods from being disturbed and discolouring the main body of rainwater.
- A submersible pump is installed inside the below ground Rainwater tank... when the pump or controller senses a drop in pressure due to someone turning on a tap or flushing a toilet it starts to pump.
- This rainwater is then automatically delivered by the rainwater harvesting unit to the point of use. e.g. domestic use, irrigation





5. Economic framework of the rainwater harvesting

- Economic feasibility is the major consideration in national policy development
- There is generally need for reliable information required to guide the planning process of any irrigation projects.
- This will ensure that irrigation development is done after careful analysis of the projects' feasibility and viability and circumvent development of unsustainable ventures with high maintenance and operational costs.
- Since most **RWCS** are privately owned, users are expected to pay all of the cost and provide their own labour in RWCS construction; their participation, therefore, is very important in the selection of their water supply system.
- Women are in charge of household maintenance, and water supply for them is an important chore; therefore their input and participation in the RWCS national policy development are most necessary.
- There is need to develop and implement market linkages between farmers and traders.
- There is need to develop and adopt effective PPP models for funding and operation and management of irrigation projects.
- With limited financial support from government, and foreign aid, water users should be informed and motivated to commit their own share of the cost and labour for the construction and operation of their rainwater catchment system.

6. Analysis of potentials and barriers for rainwater harvesting and/or small-scale irrigation generation regarding the political and institutional framework.

▪ Potential of Rainwater Harvesting

- Rock catchments
- Roof tops
- Roads (drainage)
- Low lying areas that are drought prone are sometimes affected by flooding – channeling and storage of the water or use the spates to grow crops

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Barriers

- People may not understand the principles and lack interest
- Initial development costs may be high and unaffordable for some farmers
- Matching the technology with the appropriate financial resources and the appropriate institutional environment.
- Different cultural and traditional beliefs

e.g. the taste of water, with its relatively low mineral content, is in some cultures a factor that has to be taken into account. Flowing water is sometimes considered more pure than stored water etc

Opportunities

- Improvement in production structure (cropping intensity, crop productivity, etc.) and conditions
- Improvement of household food security
- Improvement of income, through the introduction of high value crops
- Enhances diversification into other income generating activities

Political and Institutional framework

- RWH interventions for irrigation purposes draw together a number of stakeholders with different roles, responsibilities and interests.
- It is important to understand the obligations and concerns of each institution and its linkages to RWH activities for irrigation interventions
- Institutional landscape with respect to irrigation development in Zimbabwe is not sufficiently structured
- Institutions involved in RWH
 - ZINWA – Deal with major dams in the country
 - DDF – Also does dams and boreholes to a certain level
 - Min of Public works – Design and construction of drainage systems and roads
 - Department of Agricultural Mechanisation – Soil and water conservation works (in situ - harvesting)
 - Ministry of Health – Regulation of standards of water quality standards
 - Environmental Management Agency – Regulation of environmental flows and management of vleis

- The Water Policy, EMA Act and Water Act all mention rainwater harvesting
- This forum should look at the acts to ensure that the acts do not conflict
- There is need for research and analysis of the different acts to check if they support or inhibit the RWH interventions for irrigation development
- Currently developing an Agricultural Mechanisation and Irrigation policy which recognizes the different RWH technologies and their importance in Irrigation development
- Management of large scale irrigation schemes – Most rivers are untrained and excessive rainfall often leads to flooding and subsequent damage of irrigation infrastructure
- It is possible to develop and implement rainwater harvesting systems in Zimbabwe for irrigation at both small and large scale.
- Assessments by EMA, ZINWA, Min of Public works and Min of Health may be required.

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