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# **EFFECTIVENESS OF INTEGRATED AGRICULTURE, HEALTH LIVELIHOOD & NUTRITION INTERVENTIONS TO IMPROVE MATERNAL AND CHILD NUTRITION & HEALTH IN RURAL UGANDA : A COHORT BIRTH STUDY**

## **BUGANGARI SUBCOUNTY**



**HARVARD**  
SCHOOL OF PUBLIC HEALTH



**Tufts**  
UNIVERSITY

# Outline

- Study team
- Objectives of the Study
- Implementation Status
- Research design
- Data Collection
- Results
- Conclusions

# STUDY TEAM

## **MAKERERE UNIVERSITY**

- Prof. Bernard Bashaasha, PI
- Dr. Flo Turyashemererwa, Project Coordinator.
- Ms, Annet Kawuma, Research Specialist
- Edgar Agaba, Researcher

## **IFPRI**

Dr. Nassul Kabunga, Post Doc Fellow

## **TUFTS UNIVERSITY**

- Prof. Jeffrey Griffiths, Director
- Dr Shibani Gosh, Associate Director

## **HARVARD SCHHOL OF PUBLIC HEALTH**

- Dr. Christopher Duggan , Co -PI
- Dr Wafale Fawzi, Co- PI
- Dr Nilupa Gunaratna, Co- PI

# Overall Objective

- To understand the effect of Integrated Interventions (Nutrition, Agriculture and Health ) on the Health and Nutrition status of Mothers and Children under Two years of Age

# Specific Objectives

- To determine the Effect of integration of nutrition, agriculture and health interventions on the health and nutrition status of pregnant women and children under two years of age
- To determine the effect of aflatoxin exposure and environmental enteropathy on health and nutritional status of pregnant women and children under tow years of age

# Specific Objectives

- To assess the coverage, uptake and adherence to CC intervention messages and activities and assess the effect of heterogeneity on pregnant women and children under two years of age
- To determine the heterogeneity in the effect of CC interventions on maternal and child health and nutrition status due to variability in households

# Research Design

- A Cohort of Mothers and young children were followed from pregnancy through the first two years of life
- Randomly selected CC interventions were matched to non cc sub-counties that provided the control
- Each selected CC sub-county was individually matched to a non-CC sub-county with the same
  - Agro ecology
  - Predominant language
- The matched sub –counties are located in non-CC districts to minimize spillover from interventions areas

**Table 1: Implementation sites**

District	Sub county	Predominant Language	Status
Kabale	Ruhija	Runyankore/Rukiga	Intervention
Kabale	Nyamweru	Runyankore/Rukiga	Intervention
Kanungu	Rugyeyo	Runyankore/Rukiga	Intervention
Kamwenge	Bwizi	Runyankore/Rukiga	Intervention
Kabarole	Kibiito	Runyankore/Rukiga	Control
Rukungiri	Kebisoni	Runyankore/Rukiga	Control
Rukungiri	Bugangari	Runyankore/Rukiga	Control
Rukungiri	Buyanja	Runyankore/Rukiga	Control
Nebbi	Parombo	Alur	Intervention
Zombo	Atyak	Alur	Control
Pader	Atanga	Acholi	Intervention
Lamwo	Agoro	Acholi	Control
Lira	Agweng	Langi	Intervention
Kole	Ayer	Langi	Intervention
Apac	Aduku	Langi	Control
Apac	Apac	Langi	Control



# Sampling and Sample size

- The study was conducted in 16 sub counties
- Village health teams/guides were recruited and worked closely with the team to identify pregnant women
- Approximately 322 pregnant women were selected in each of the 16 sub-counties
- The target was to enroll 5152 pregnant women and children
  - In total 5,044(98%) women were enrolled in the study
  - Were to be followed up over a three year period
- In Bugangari Sub-county 312 pregnant women were selected and formed the study sample

# Sampling contd..

## Eligibility criteria

Sample of respondents consisted of

- Pregnant women aged 15-49 years
- Women in their second and third trimester
- Must be Living in the study area until study follow-up period
- Mother provides informed consent

# Data Collected

- At Household level
  - Demographic and socioeconomic information  
Household composition, Wealth indicators, assets, income, livelihood activities , social participation, water and sanitation, sanitation, access to health services
  - Agriculture  
Activities, production and sale, labor, utilization of technologies and management practices
  - Food Security
  - Gender roles and Dynamics  
Women's role in agriculture, access, ownership and control of assets , production and income, decision –making, time use and access agricultural and nutritional information

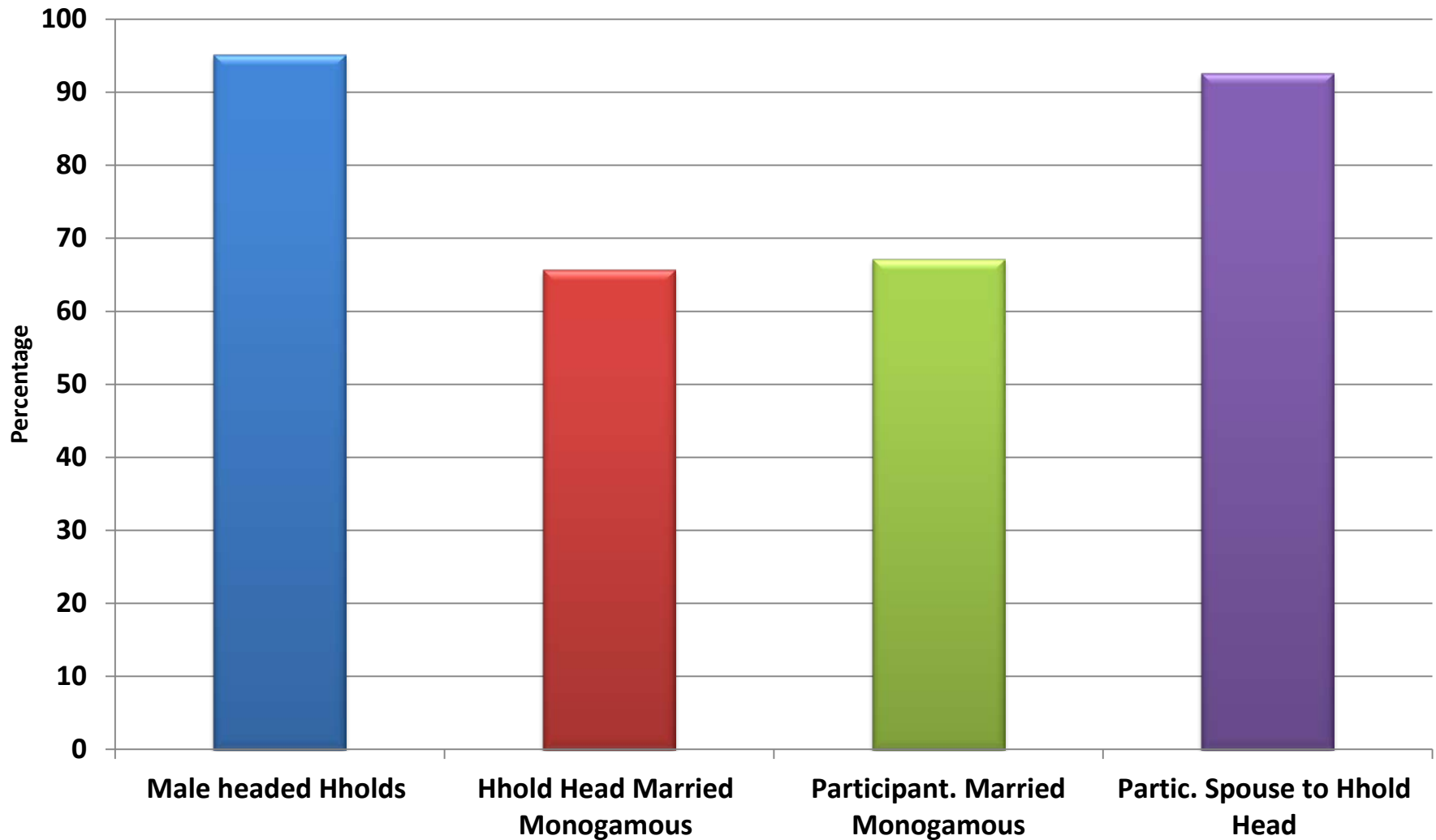
# Data Collected

Caregiver and child (0-23 months)

- Diet
  - Included infant and young child feeding practices
- Health
  - Recent morbidity, hygiene, utilization of health interventions and services
- Nutritional status
  - Anthropometry
- Venous blood draws
  - Iron, Malaria, Aflatoxins

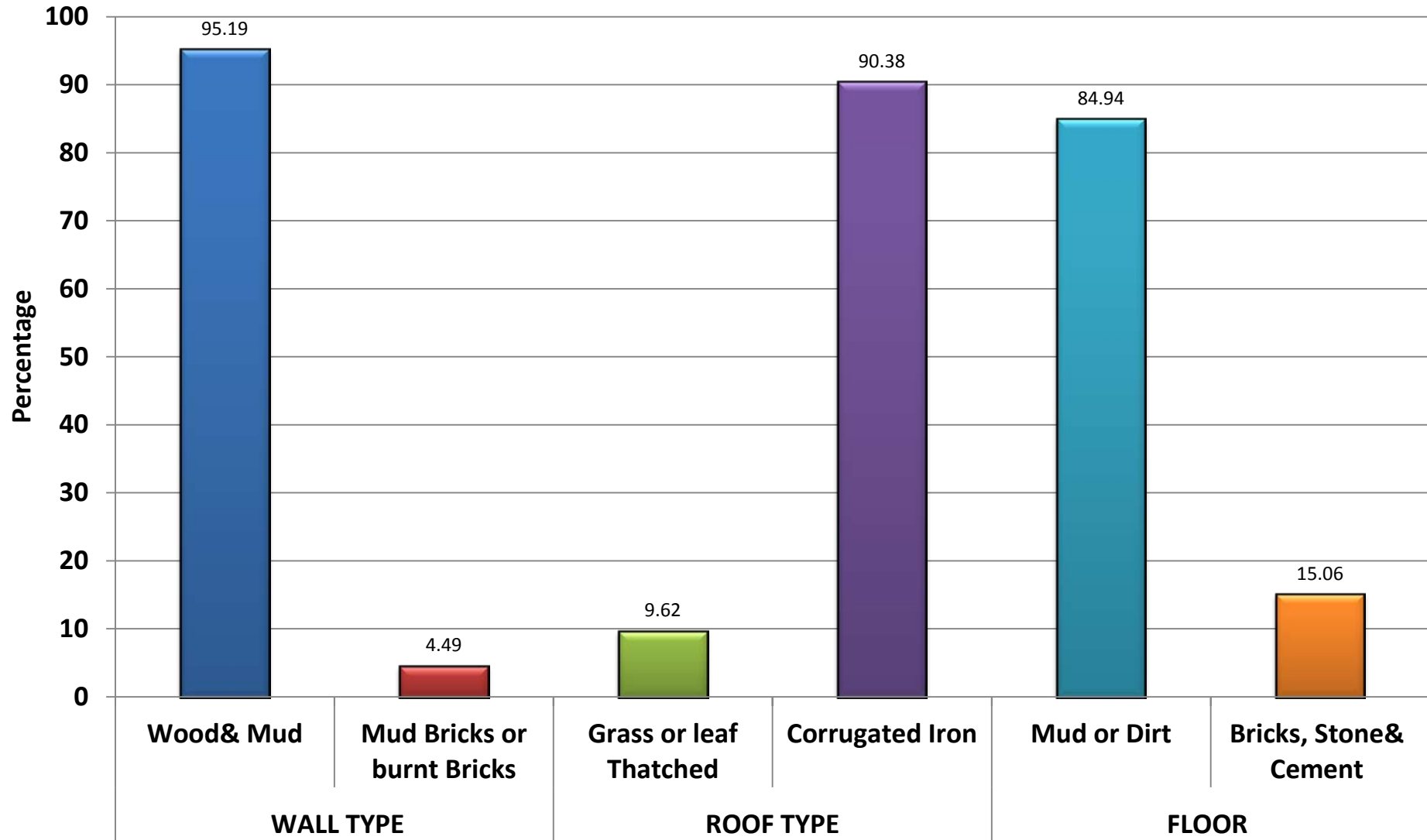
# Household Demographics

## Bugangari-Household Characteristics



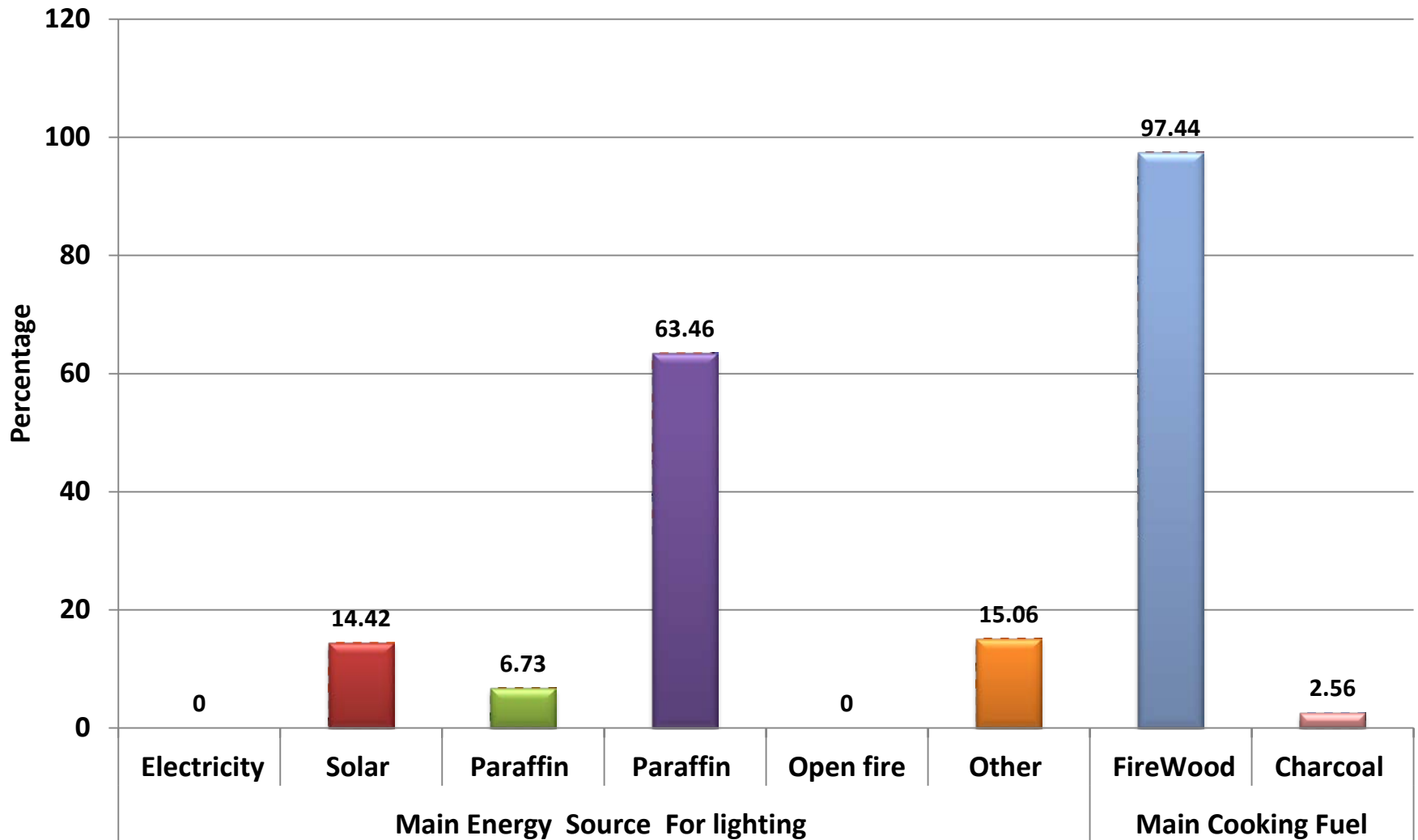
# Housing Characteristics

## Bugangari- Household Housing Characteristics



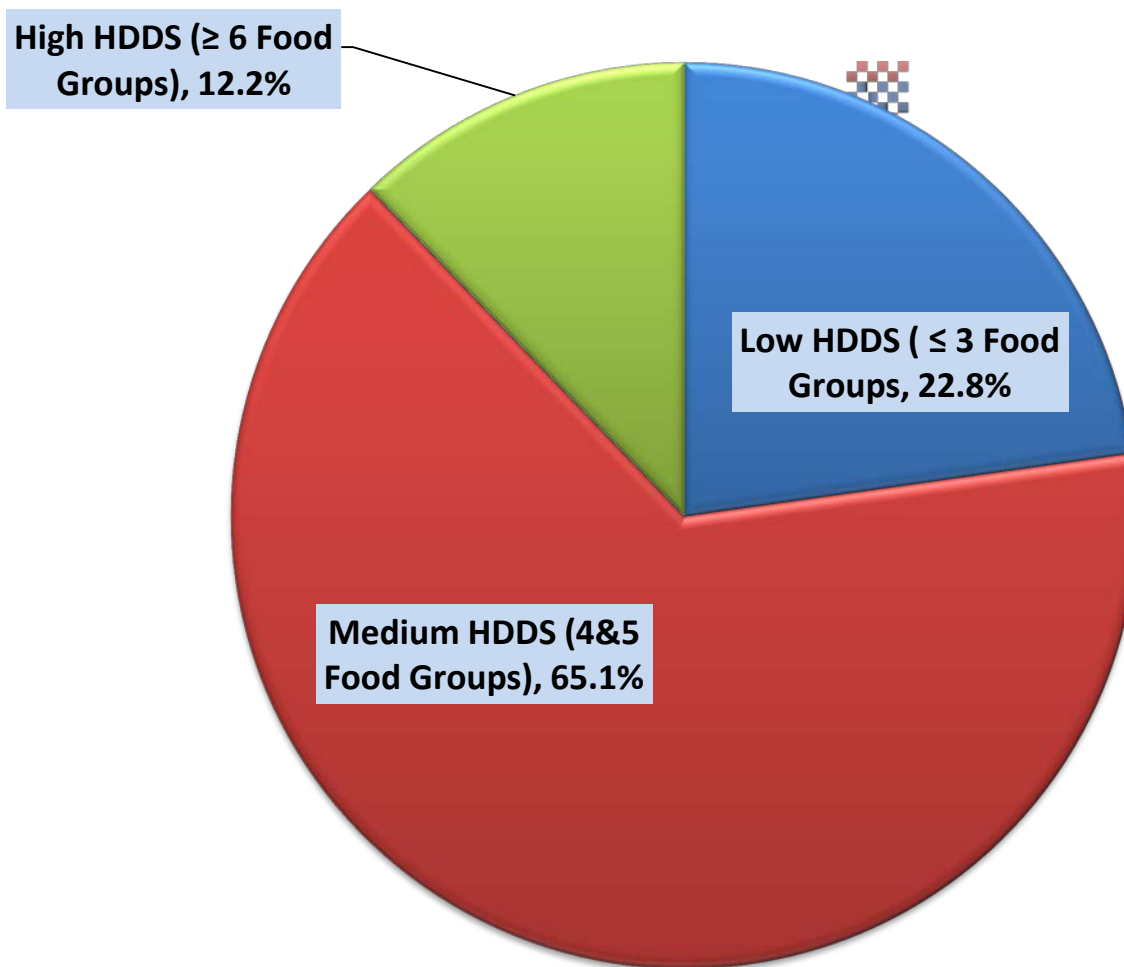
# Household Characteristics

## Bugangari-Households' Main Lighting Source and Cooking Fuel



# Household Dietary Diversity Score

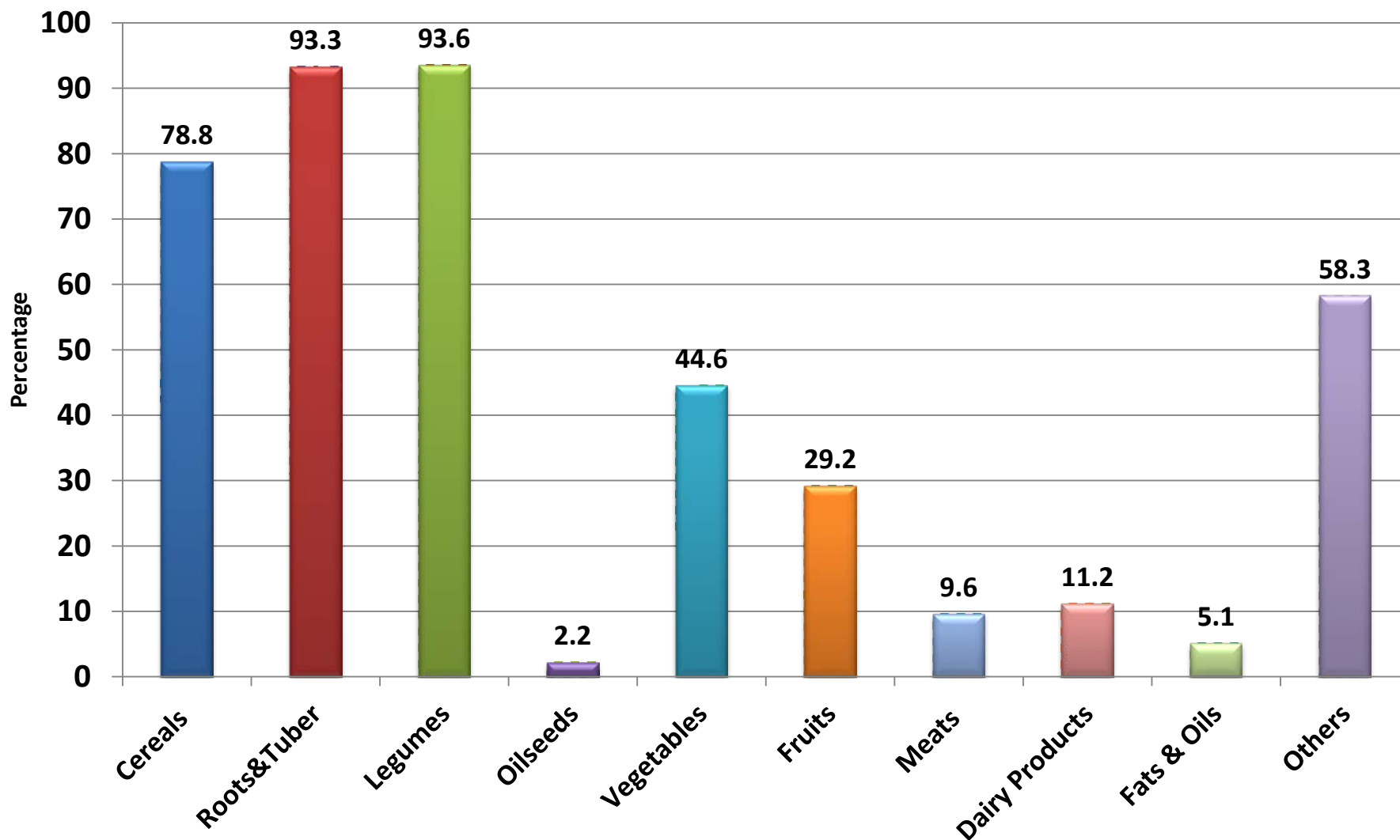
## Bugangari- Household Dietary Diversity Score





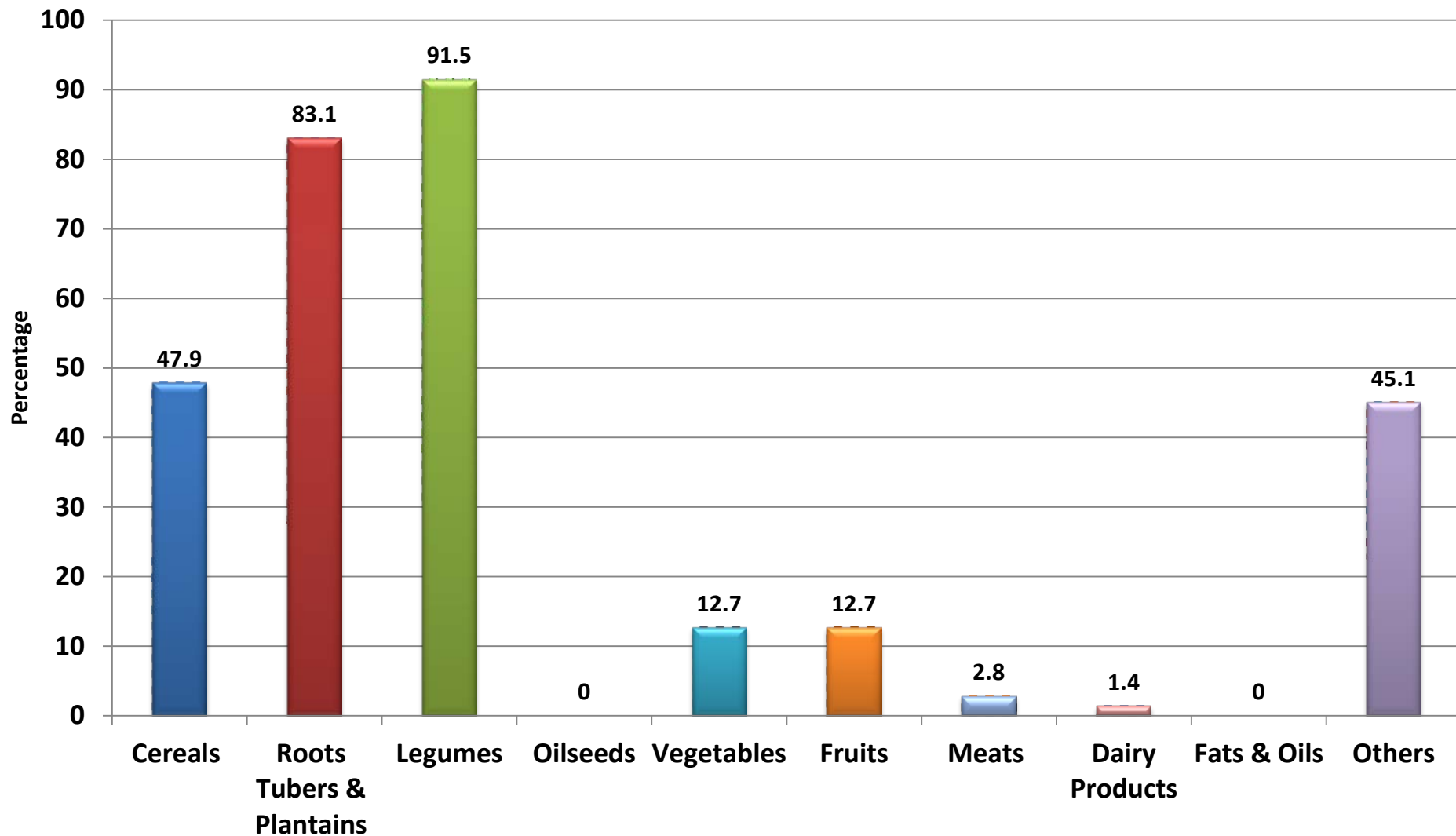
# Consumption of Major Food Groups

## Bugangari- Food Groups Consumed by Households



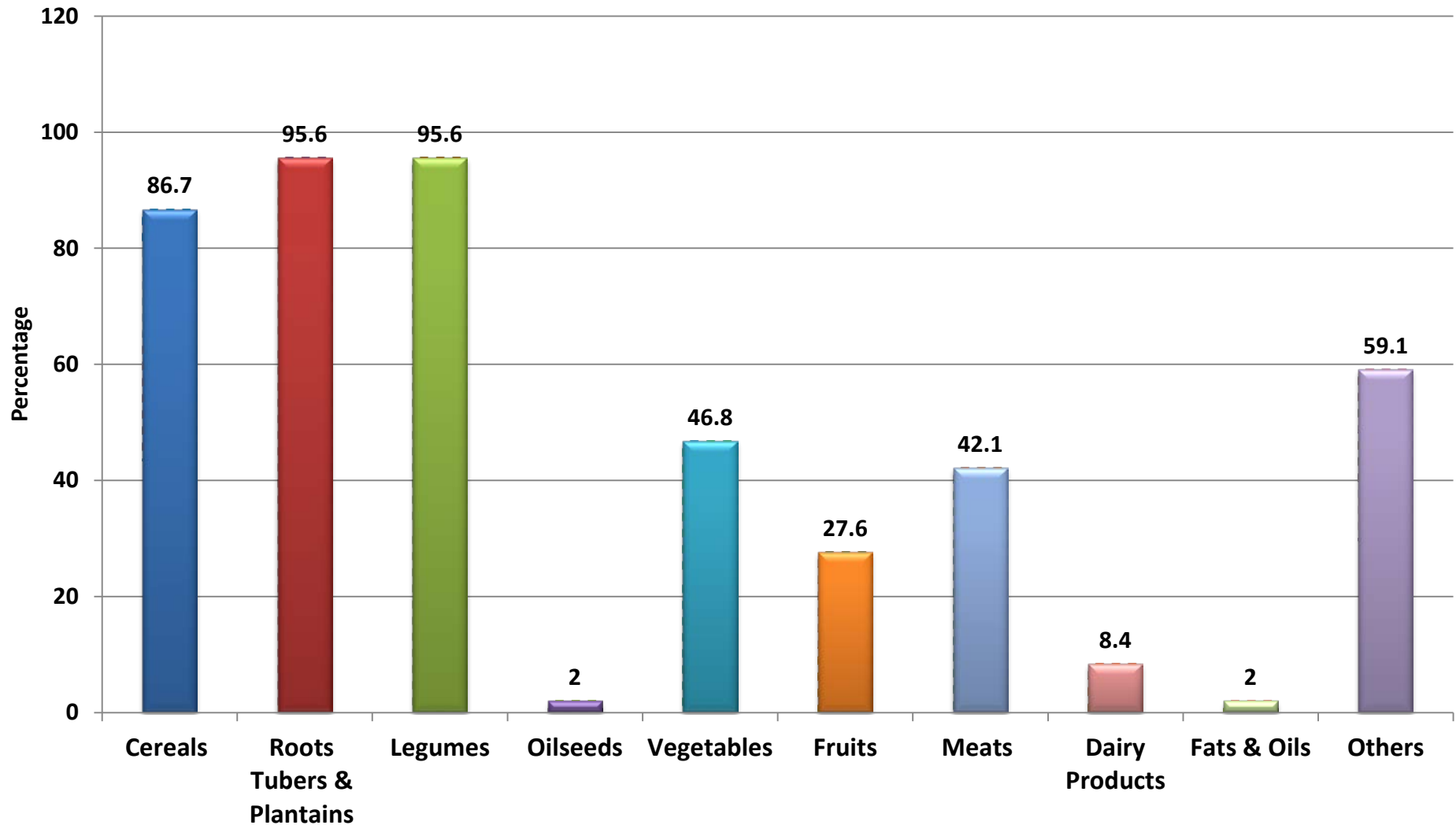
# Food groups Consumed by Low HDDS group

## Bugangari-- Food Groups Consumed by Households with Low HDDS



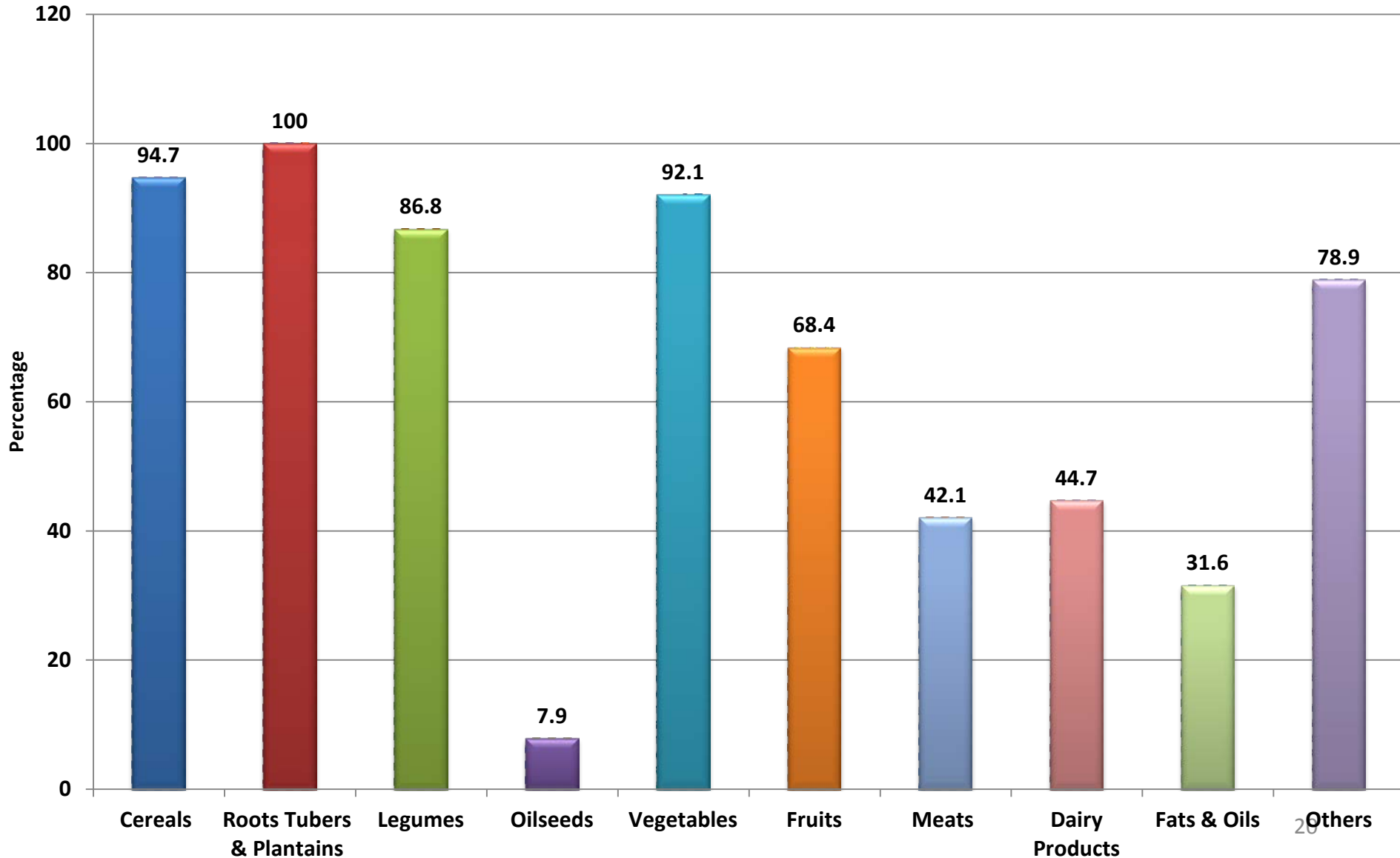
# Foods Consumed by Households in Medium HDDS Group

**Bugangari -Food Groups Consumed by Households with Medium HDDS**



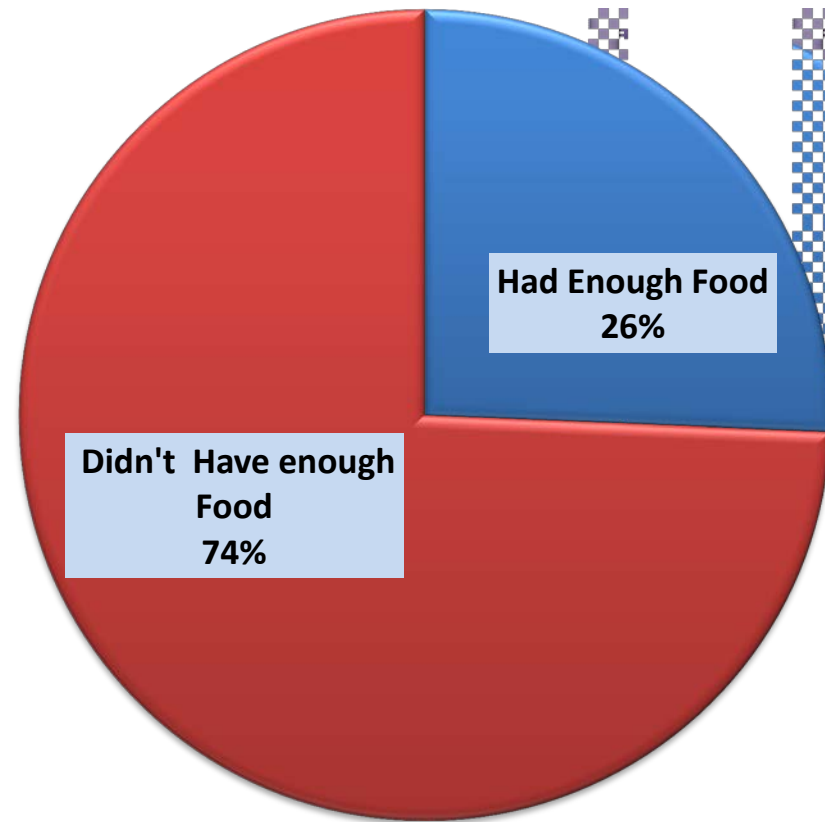
# Food Groups consumed in High HDDS Group

## Bugangari- Food Groups Consumed by Households with High HDDS



# Household Food Provisioning (MAHFP)

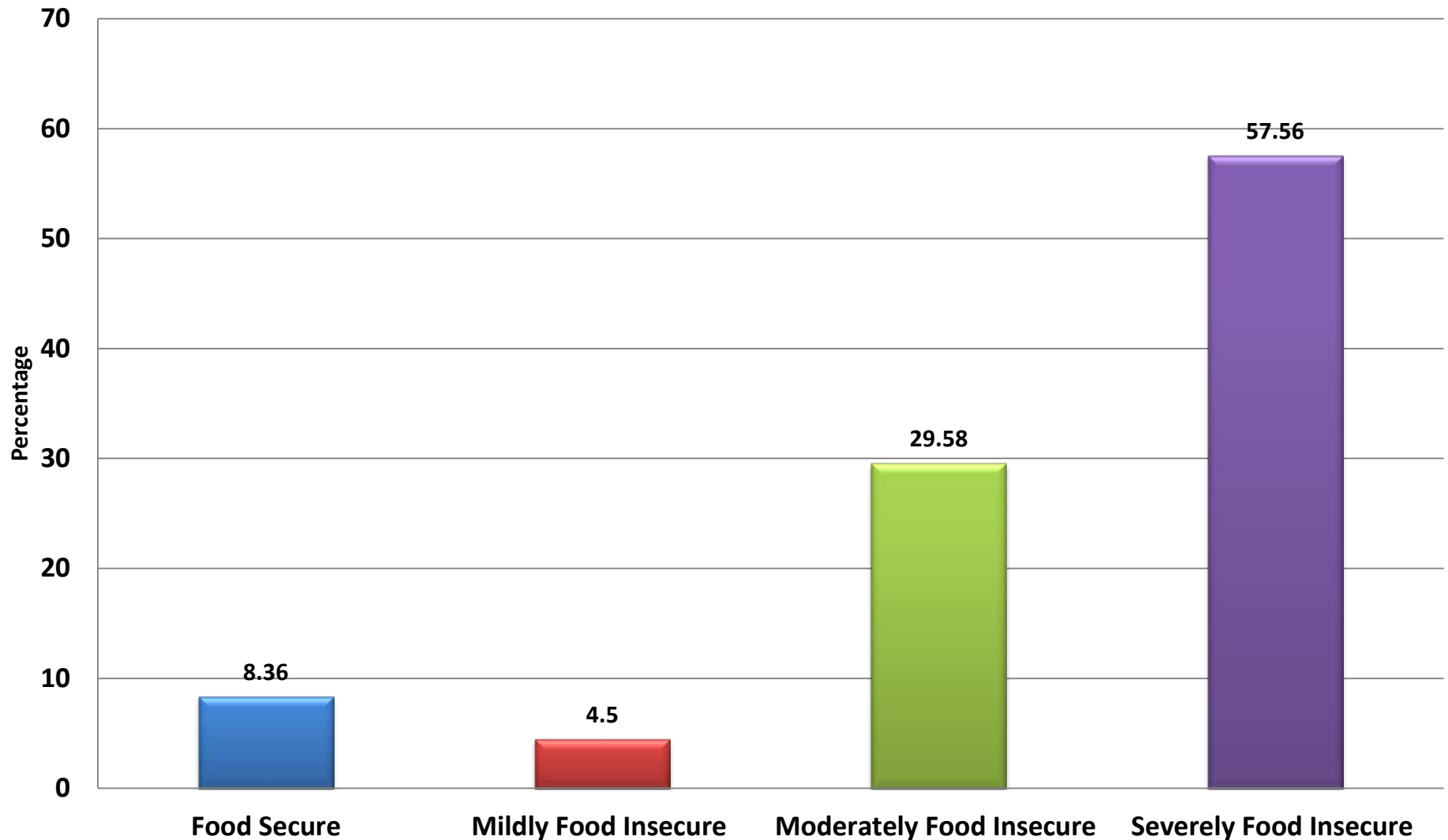
## Bugangari - Adequate Household Food Provisioning (MAHFP) in last 12 Months



Households in Bugangari had 5 months of inadequate food access in the last 12

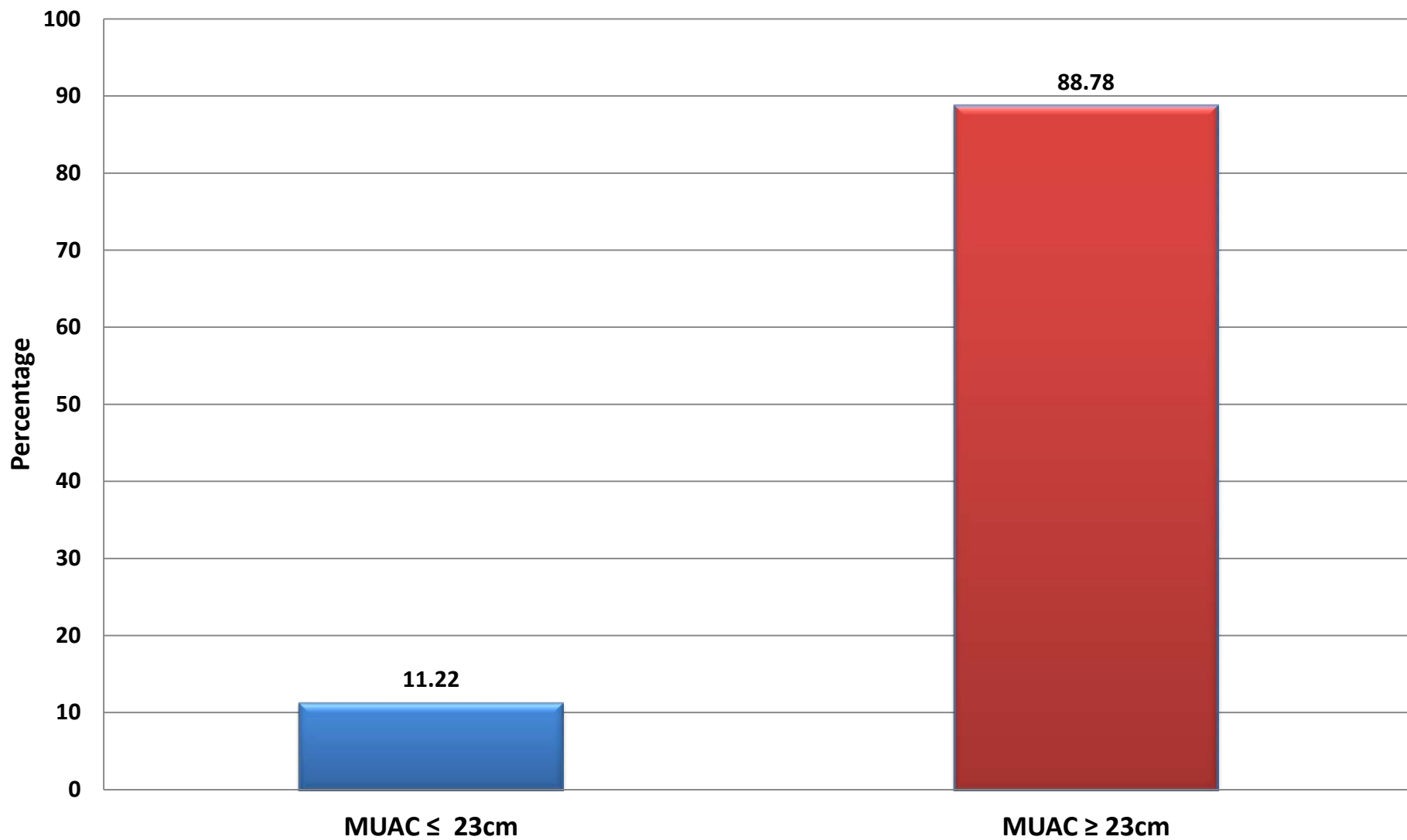
# Household Food Insecurity Access Prevalence

**Bugangari-Household Food Insecurty Access Prevalence**



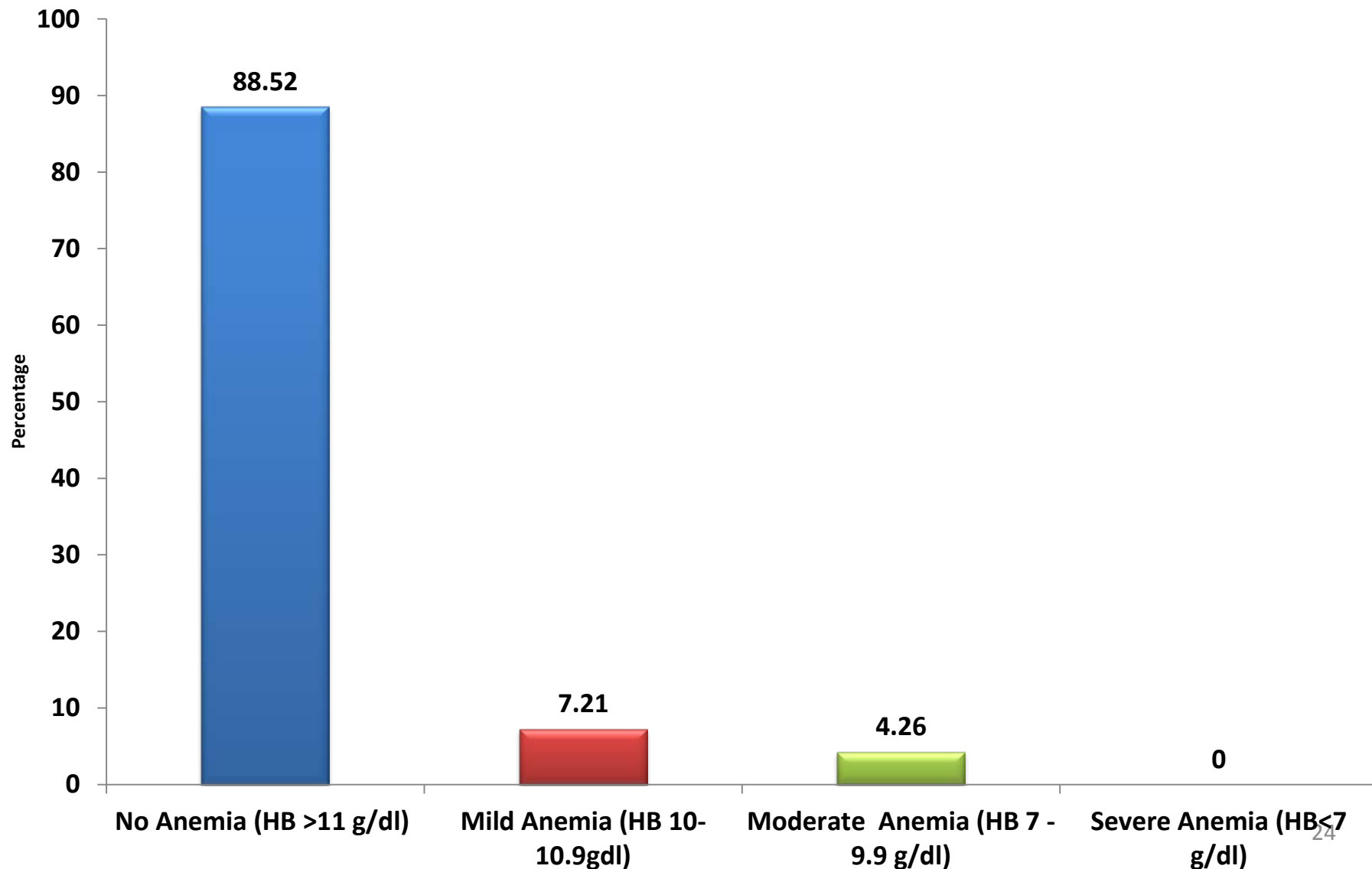
# Maternal Wasting

**Bugangari -Mid Upper Arm Circumference (MUAC) for Pregnant Women**



# Maternal Anemia

Bugangari - Prevalence of Anemia in Women 15 to 49 Years

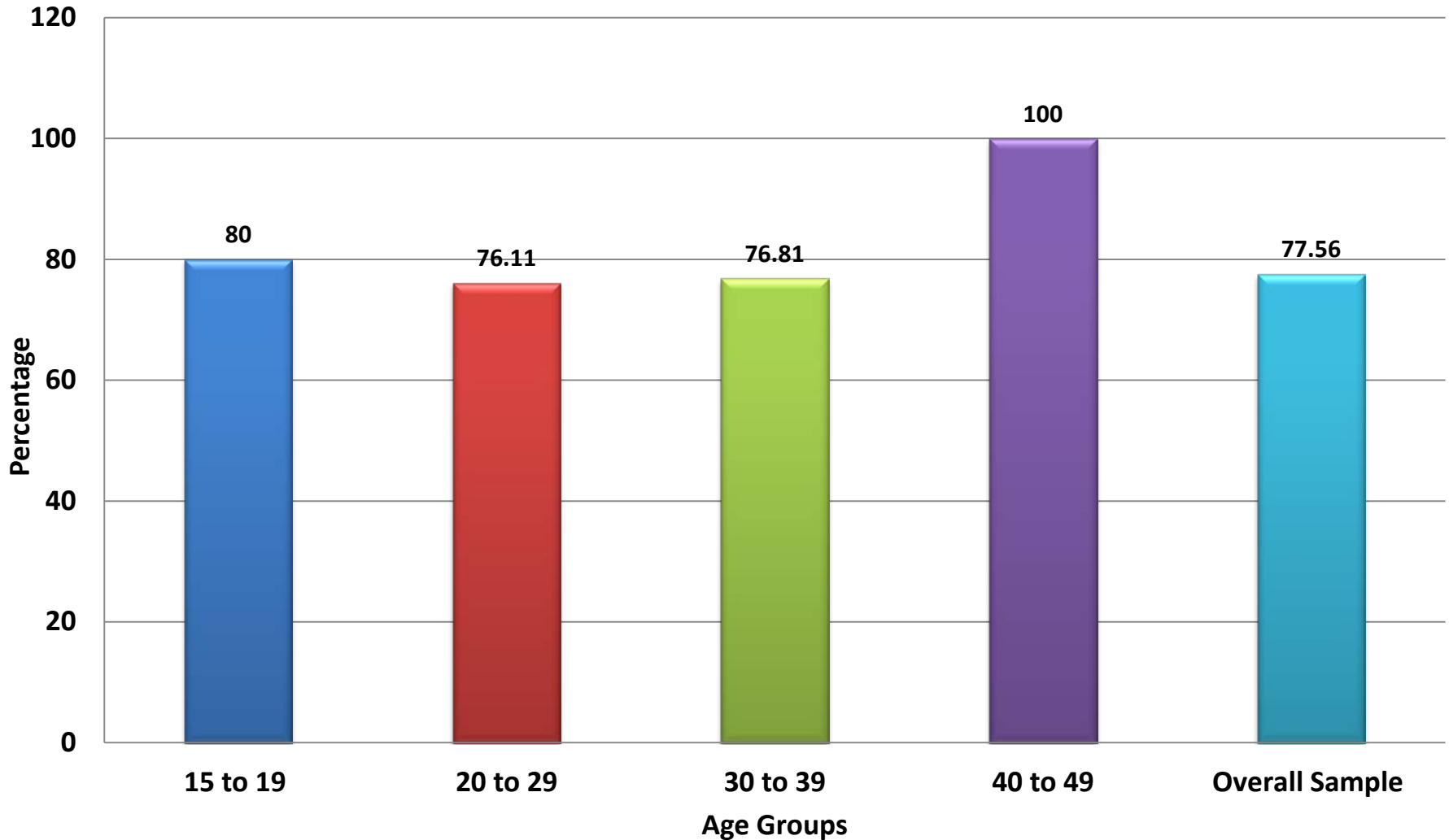




# SEEKING HEALTH CARE SERVICES

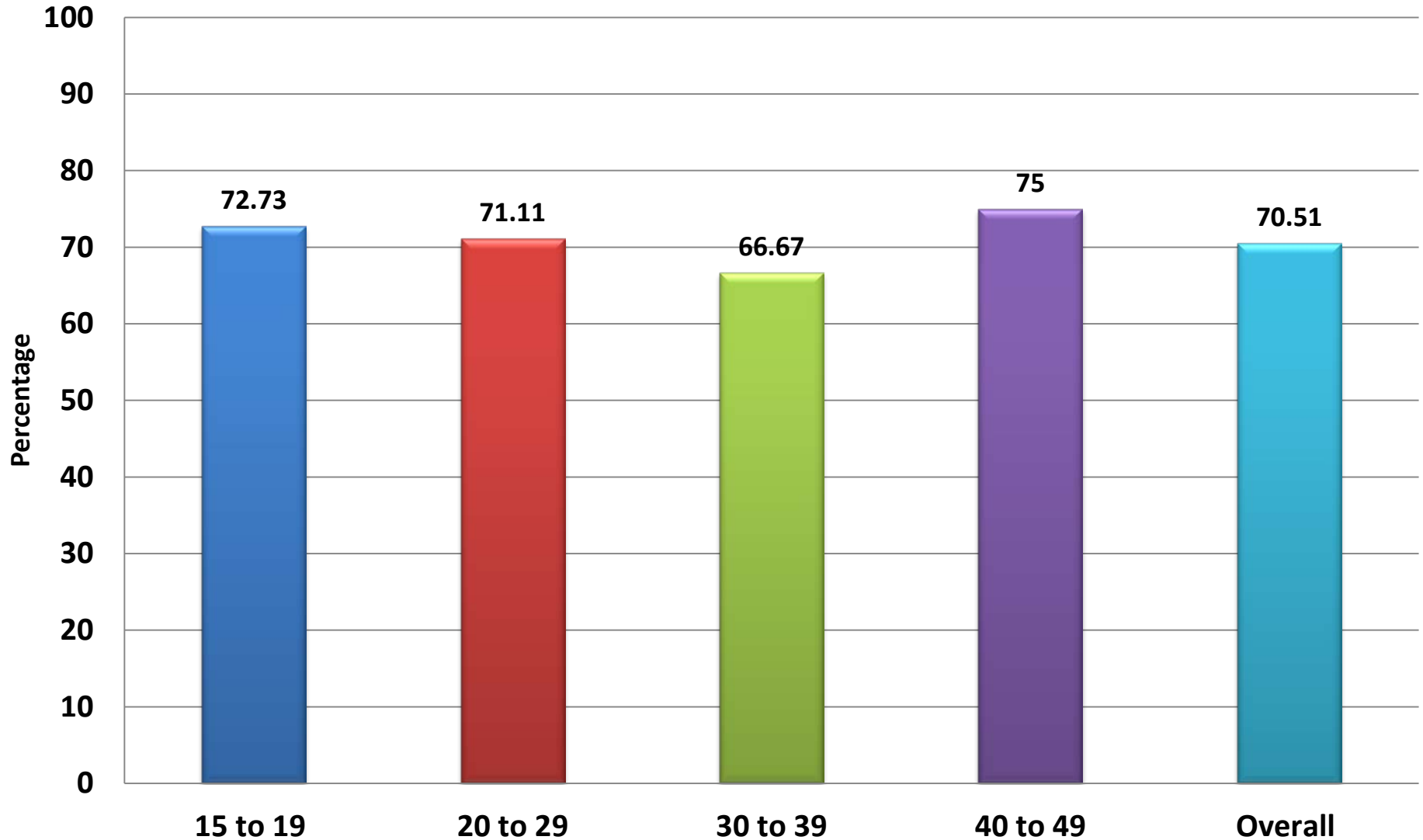
# Maternal Health Status & Pregnancy

**Bugangari -Women of Variuos Age Groups Who Sought Antenatal care**



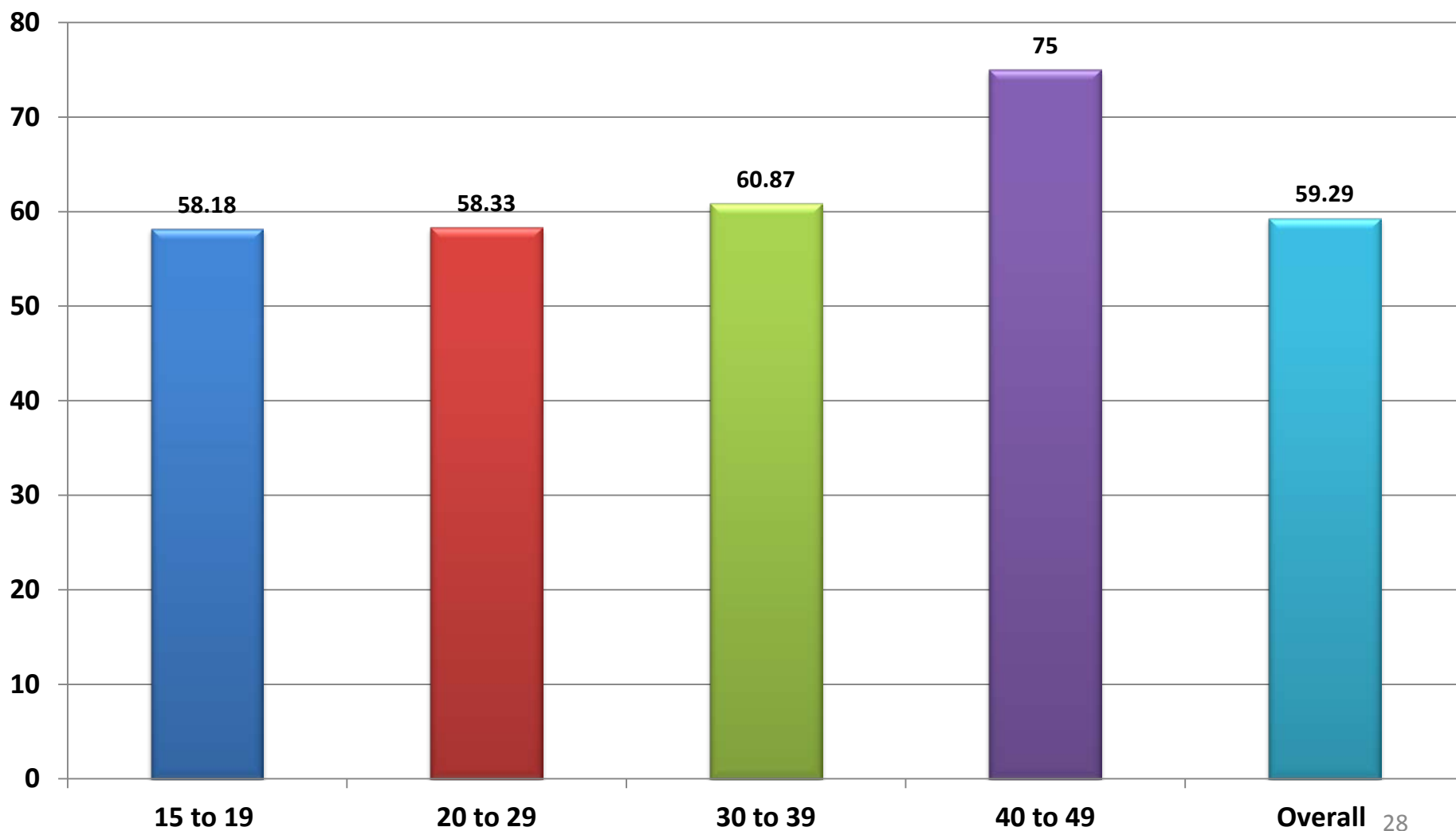
# Maternal Health Status & Pregnancy

Bugangari -Women of Variuos Age Groups Who Received or Bought Iron Tablets



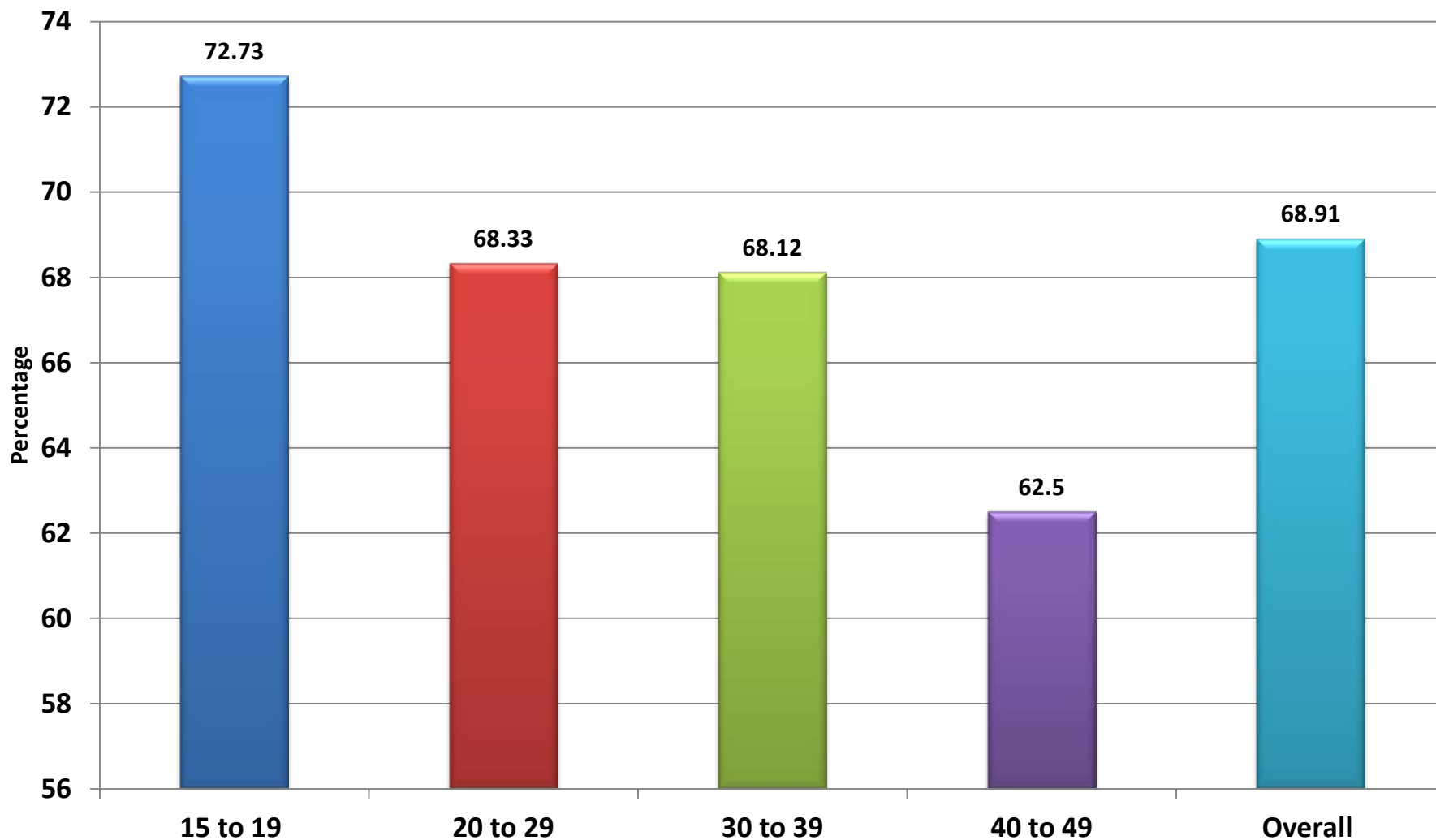
# Maternal Health Status & Pregnancy

**Bugangari- Women of Variuos Age Groups who Received Deworming  
Drugs**



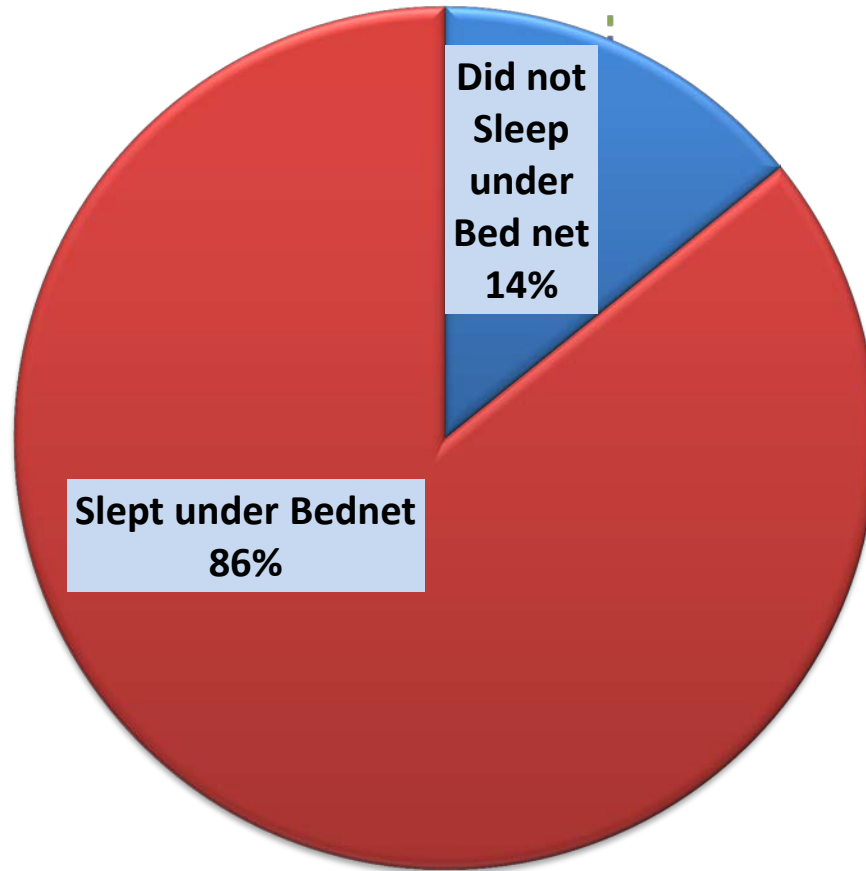
# Maternal Health Status & Pregnancy

## Bugangari-Percentage of Women who Received HIV Testing



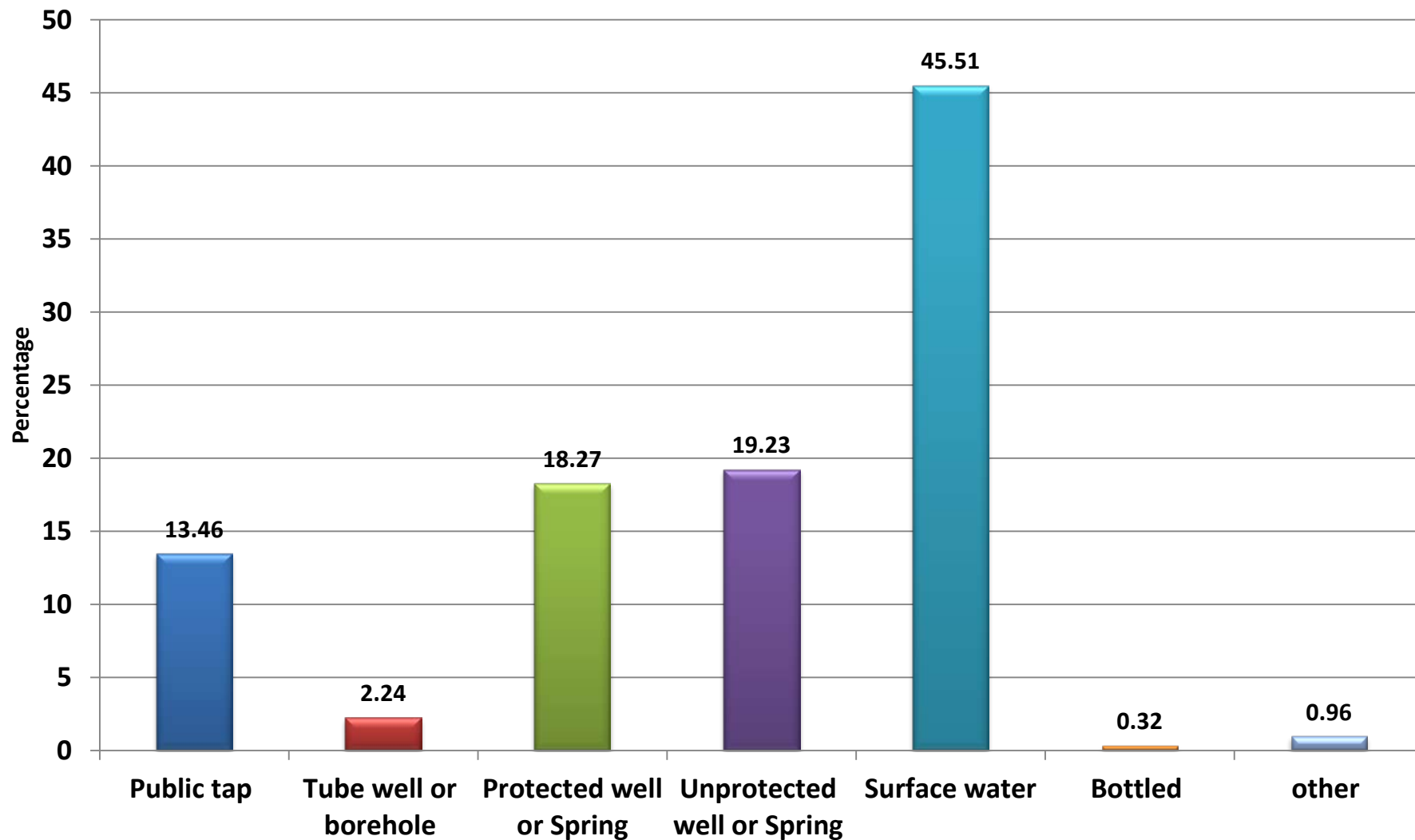
# Maternal Health Status & Hygiene

## Bugangari - Percentage of women who Slept under a Bednet



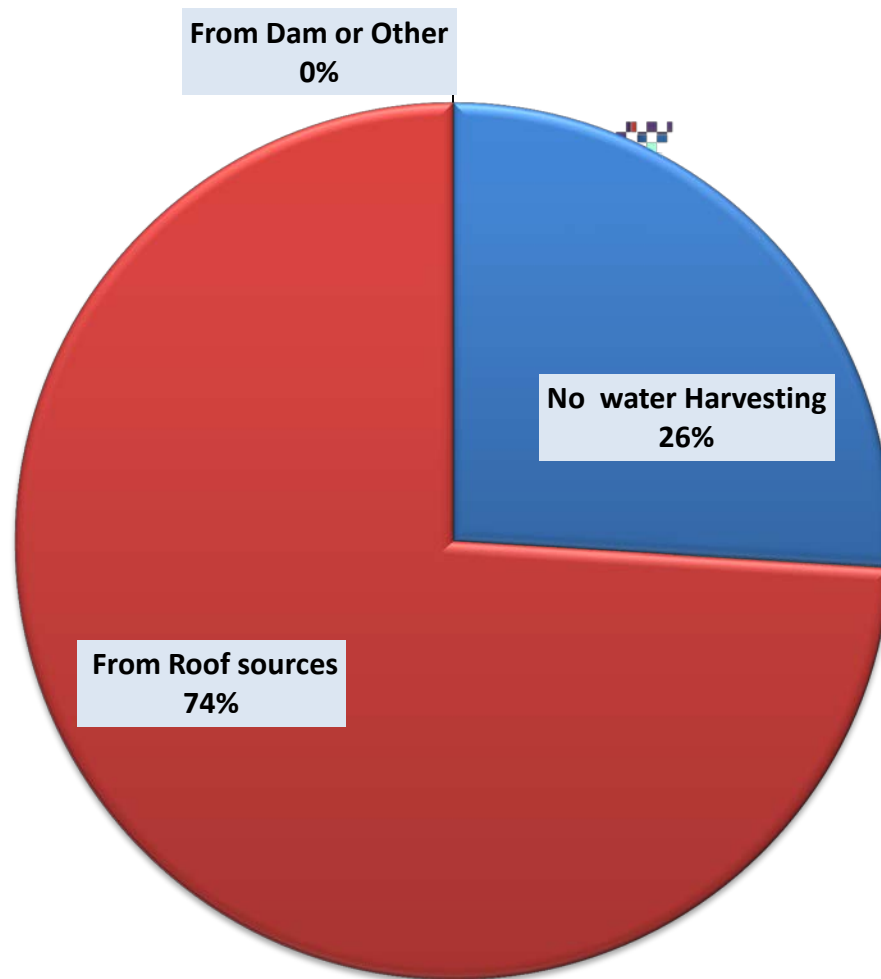
# Water, Sanitation & Hygiene

## Bugangari- Most Commonly Used Sources of Water



# Water Sanitation & Hygiene

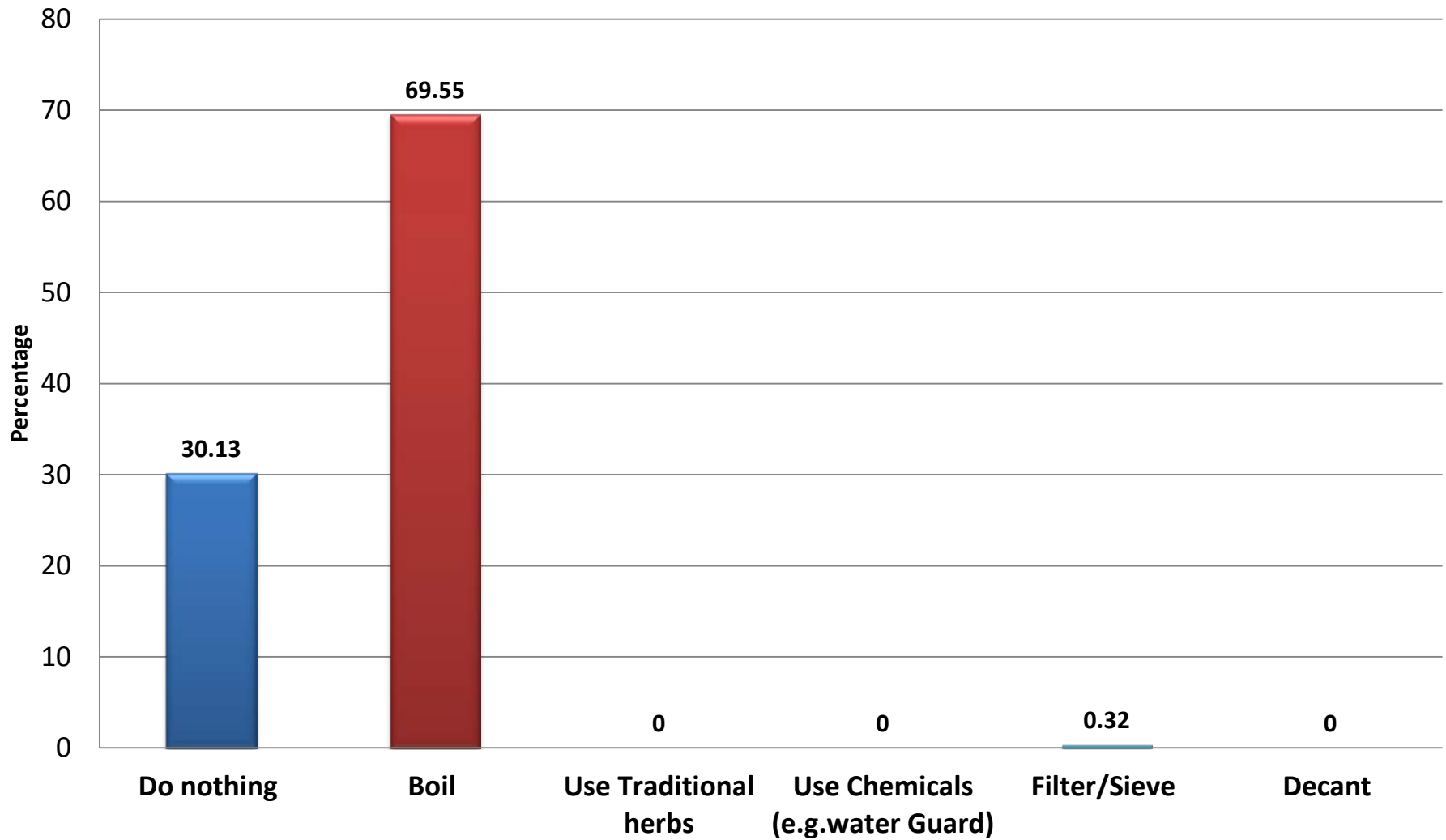
## Bugangari - Household Rain water harvesting





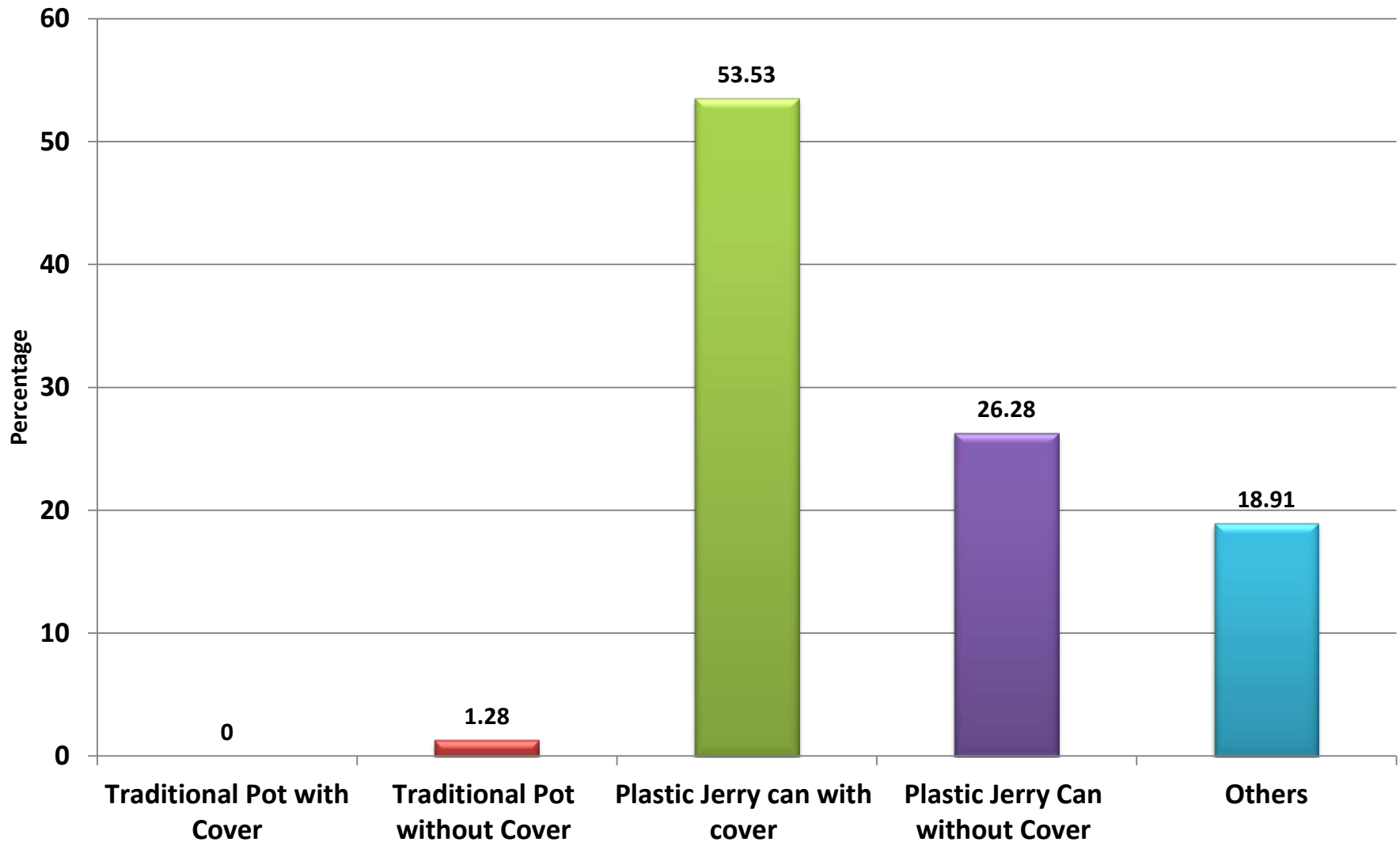
# Water, Sanitation and Hygiene

**Bugangari- Common ways Households Treat Drinking water**



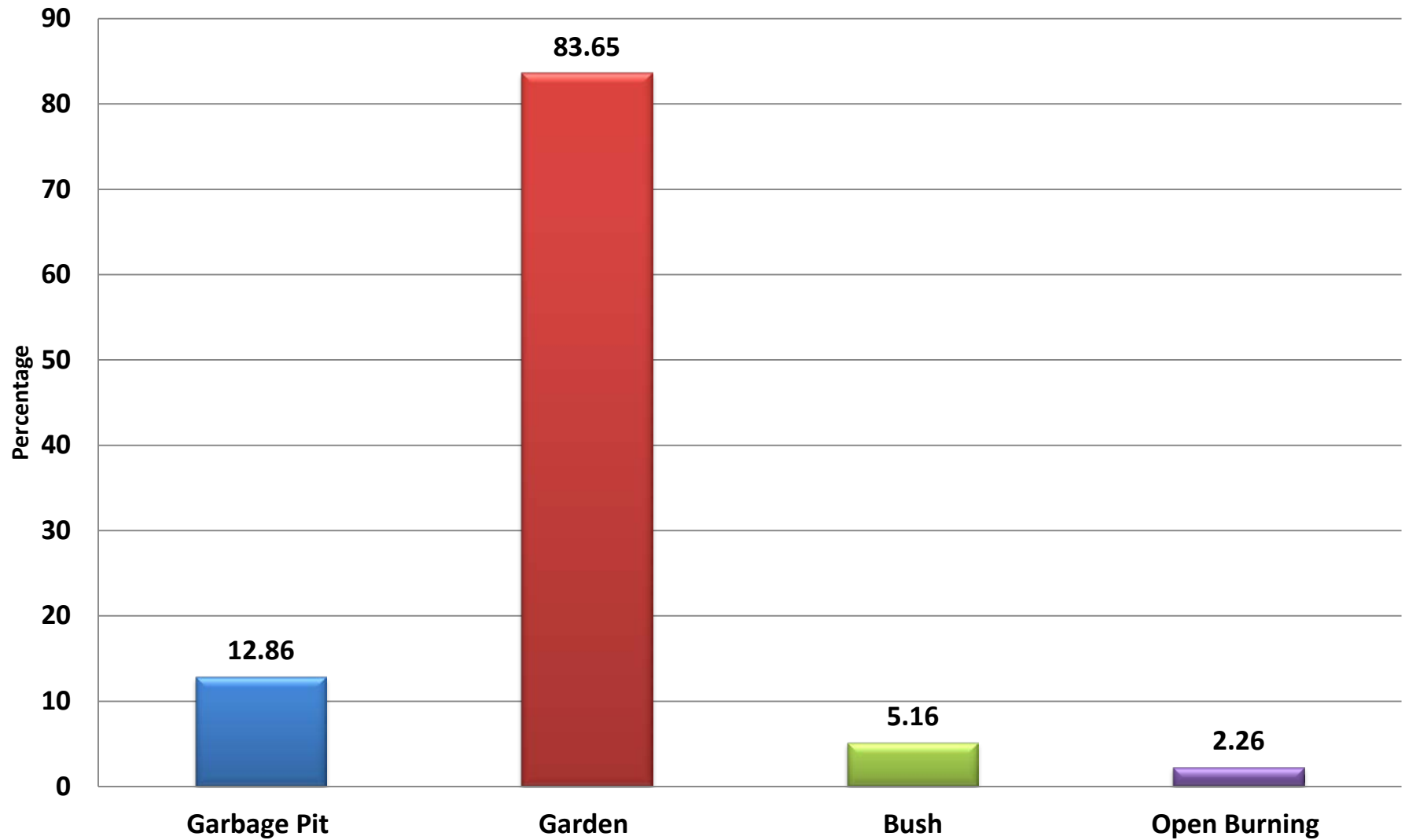
# Water, Sanitation and Hygiene

## Bugangari- Where Households Store Drinking Water



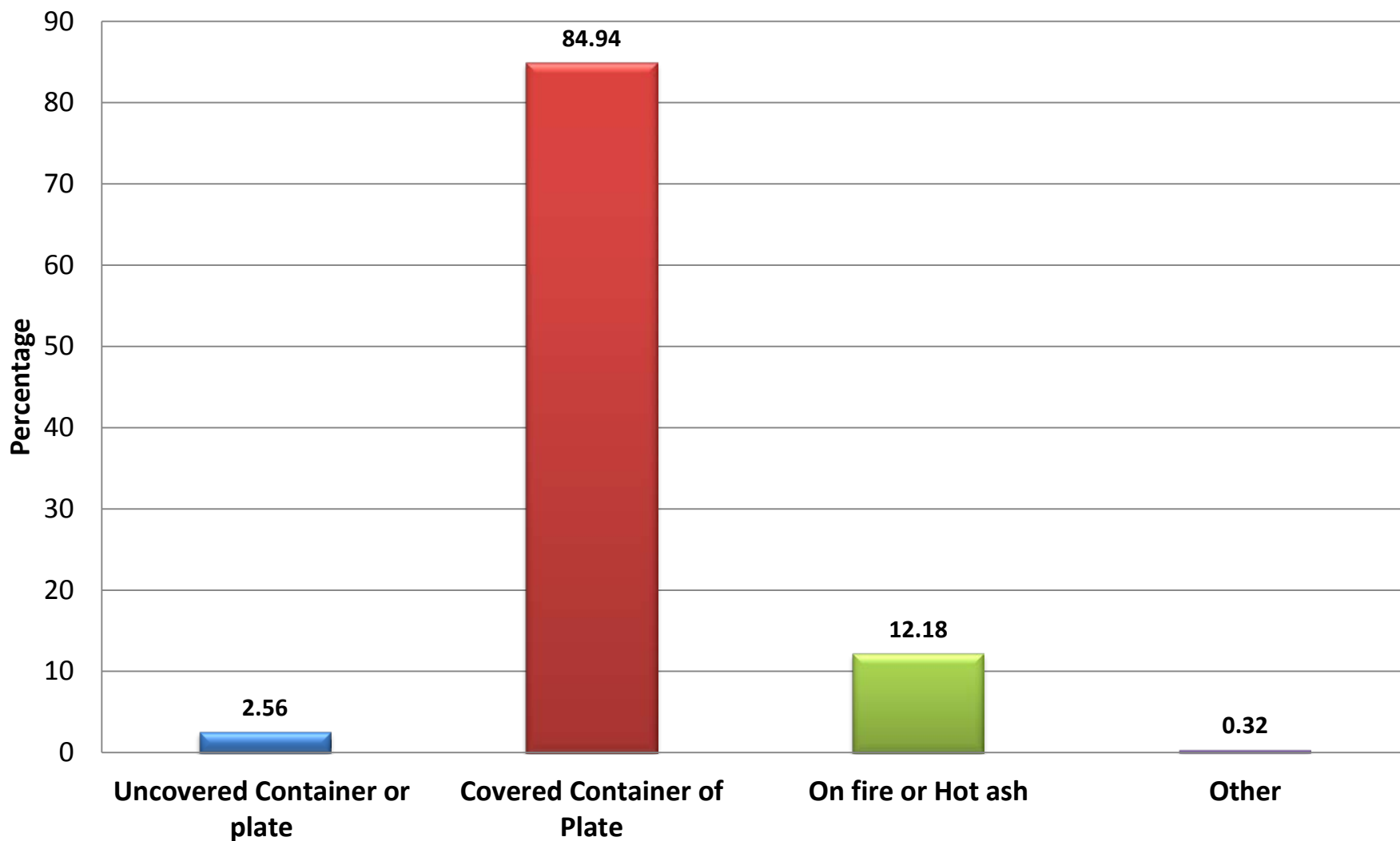
# Water, Sanitation and Hygiene

Bugangari - Household Garbage Disposal Methods (n=310)



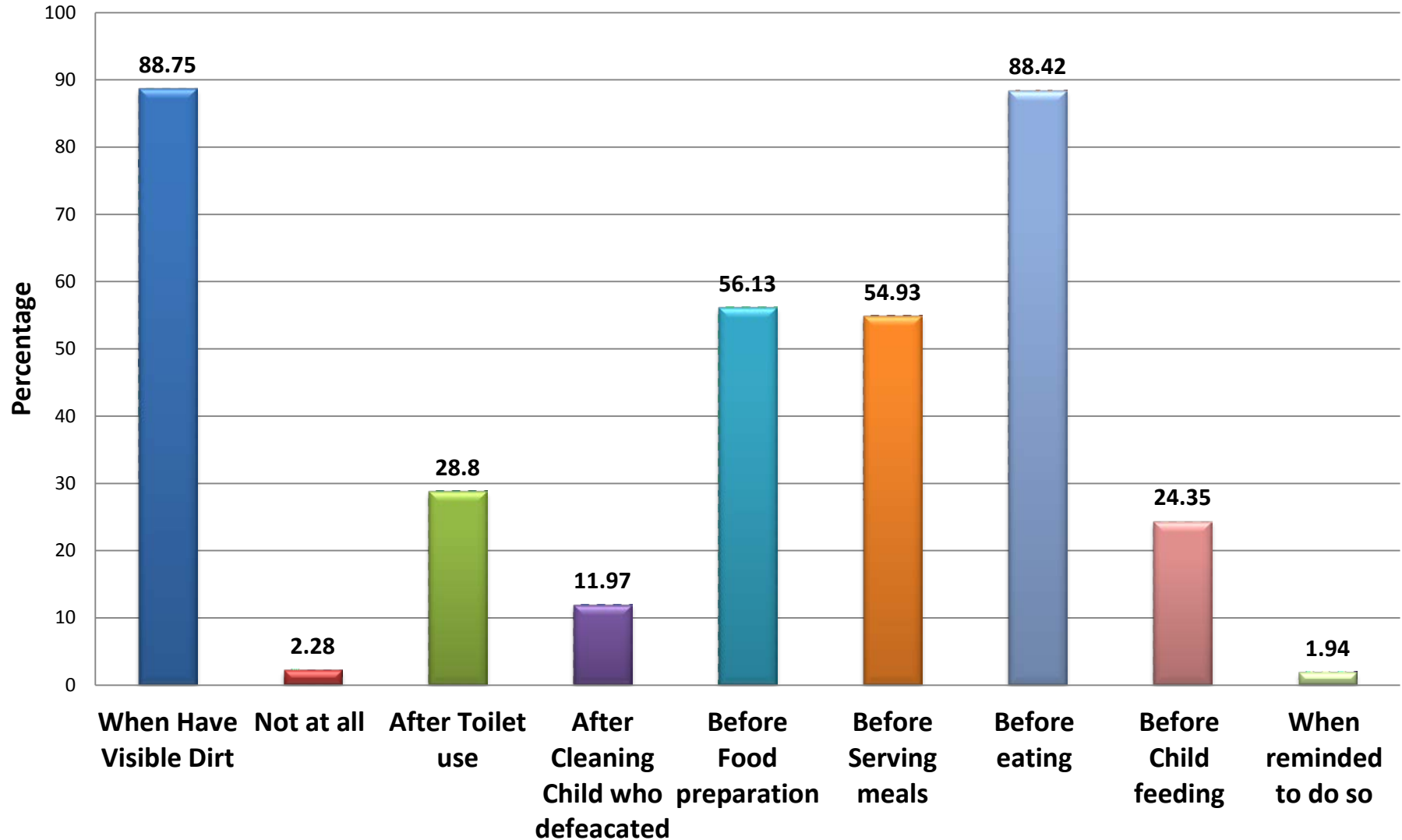
# Water, Sanitation & Hygiene

## Bugangari - Common Ways Food Prepared is Stored



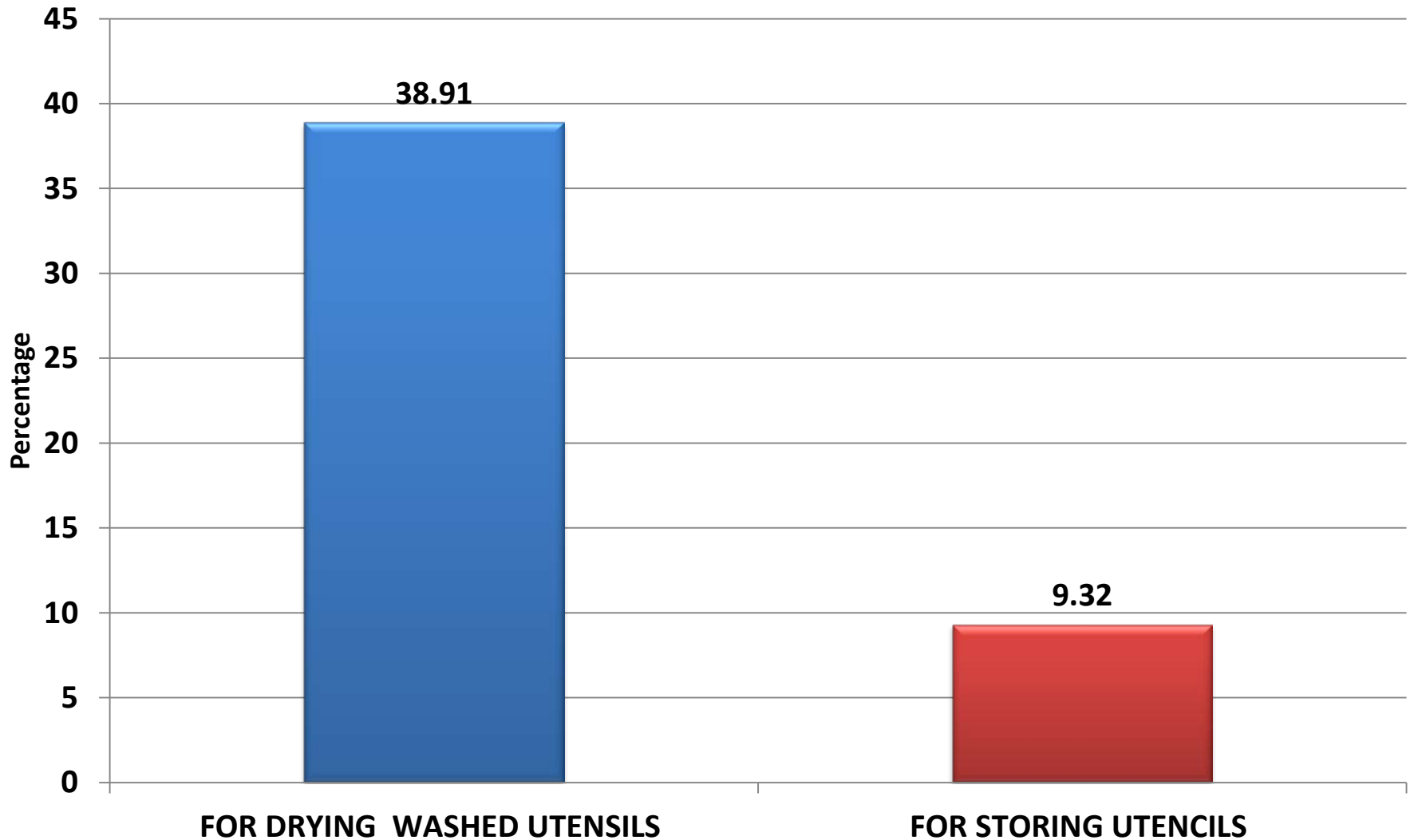
# Water, Sanitation & Hygiene

## Bugangari - Time When Repondents Wash Hands



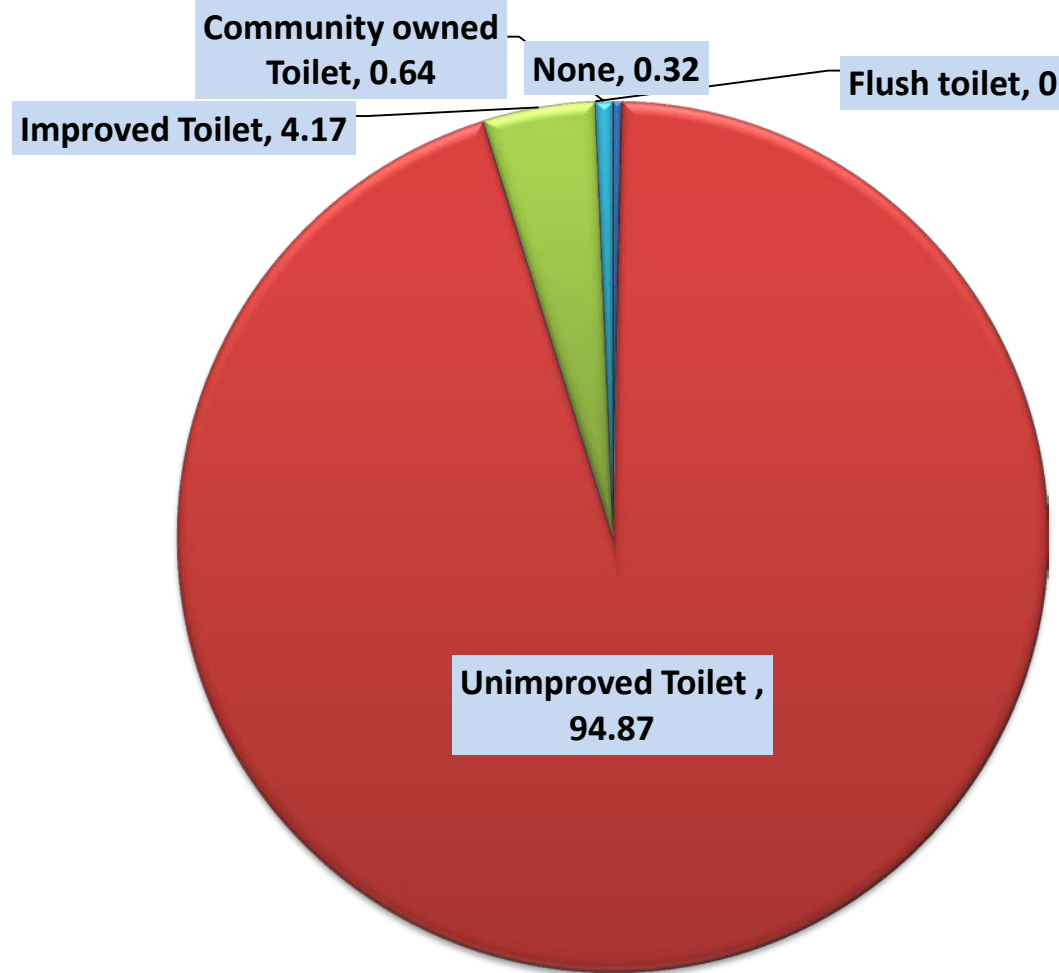
# Water, Sanitation & Hygiene

## Bugangari- Rack Ownership & Use



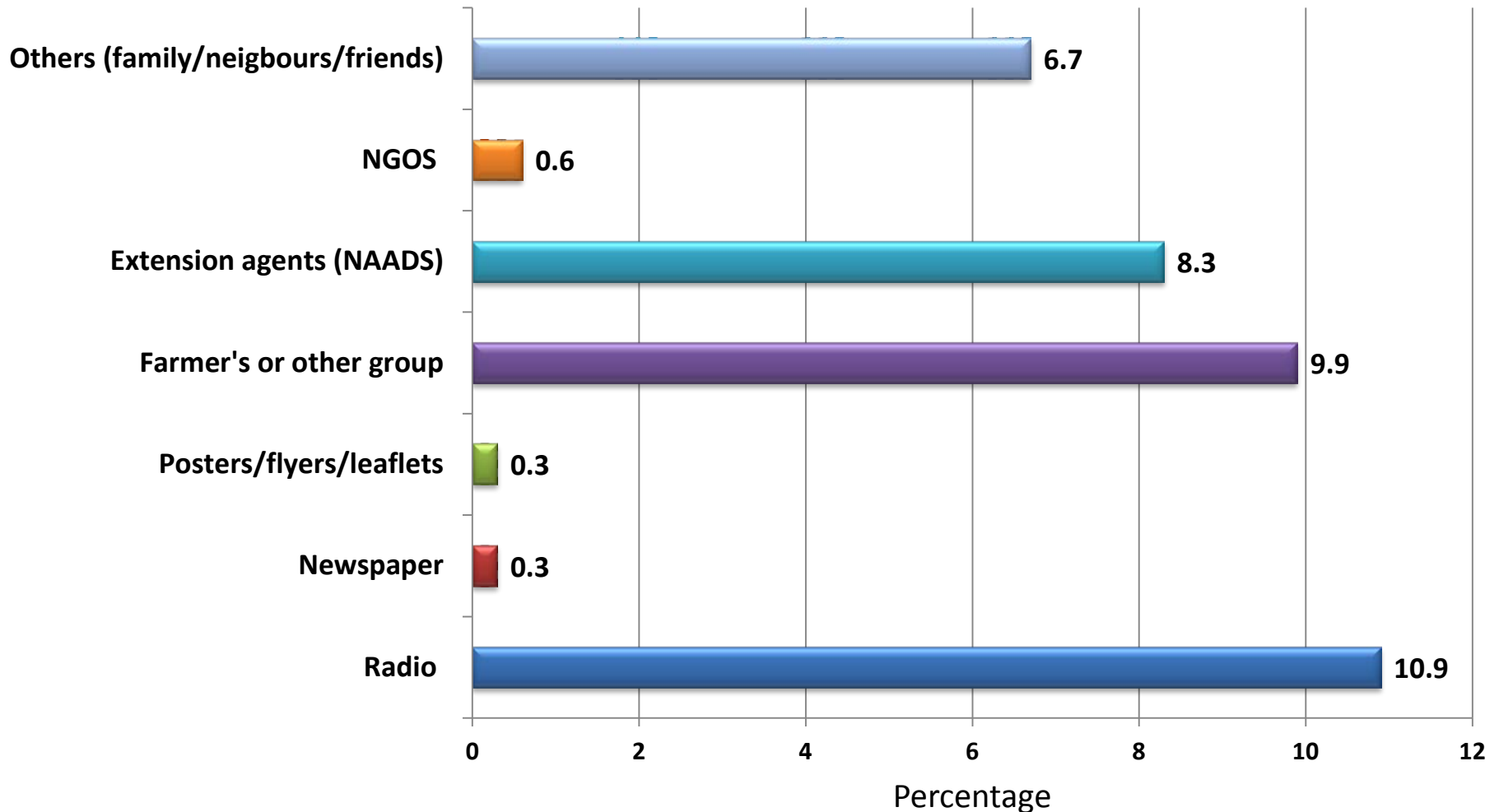
# Water Sanitation & Hygiene

**Bugangari -Common Types of Toilet used by Households**



# Sources of Agricultural information

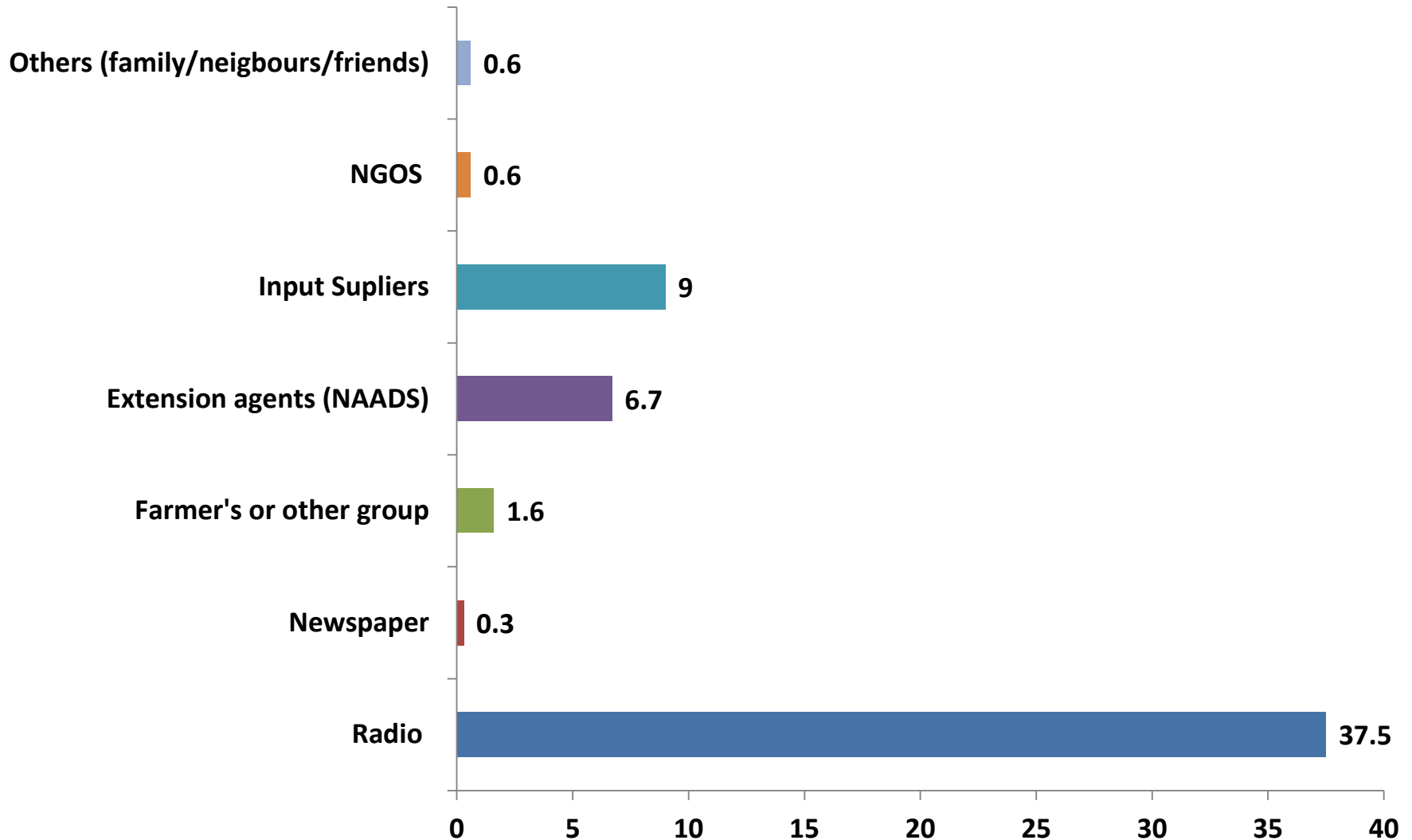
## Bugangari - Source of Agricultural information





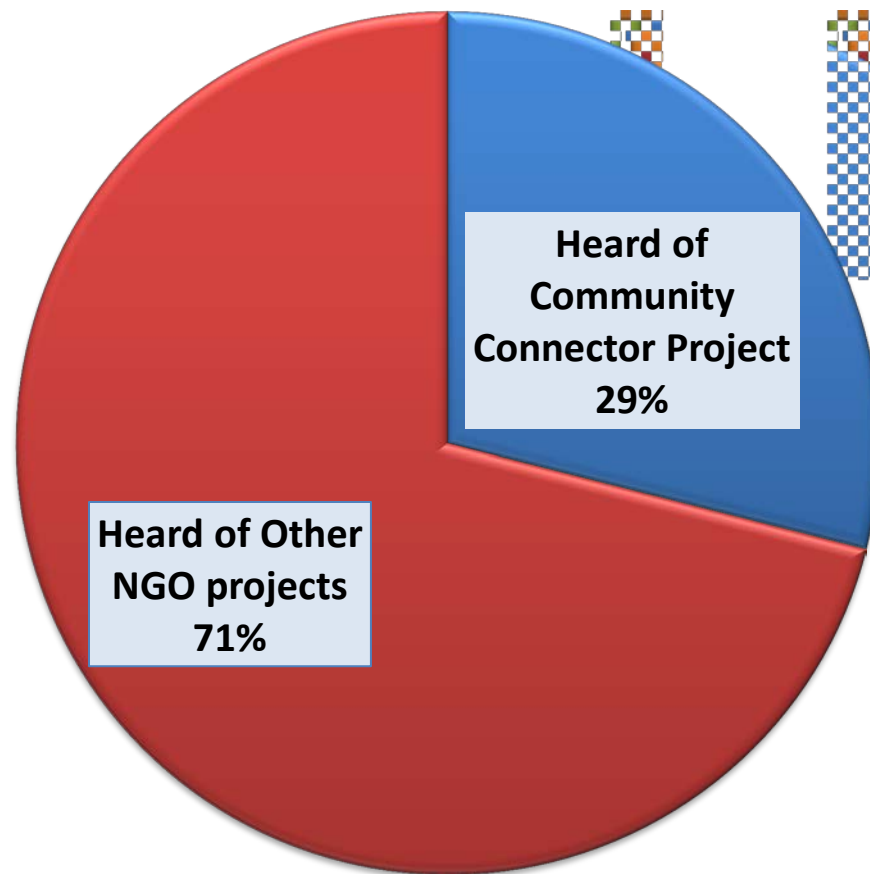
# Sources of Nutrition information

Bugangari -Sources of Nutrition Information



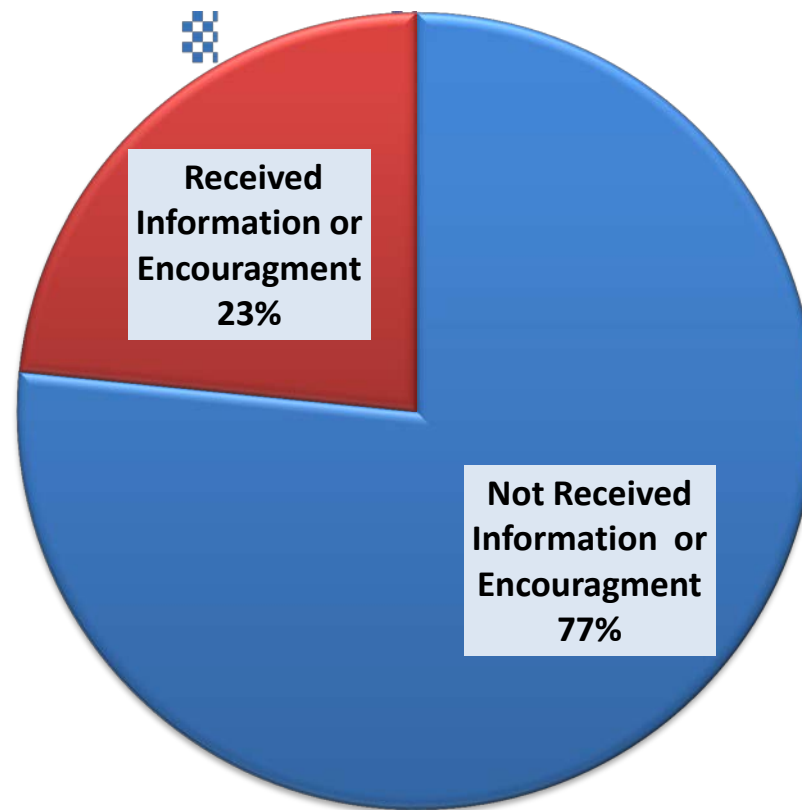
# SOCIAL PARTICIPATION, ACCESS TO INFO. , PROGRAM EXPOSURE

## Bugangari - Program Exposure & Update



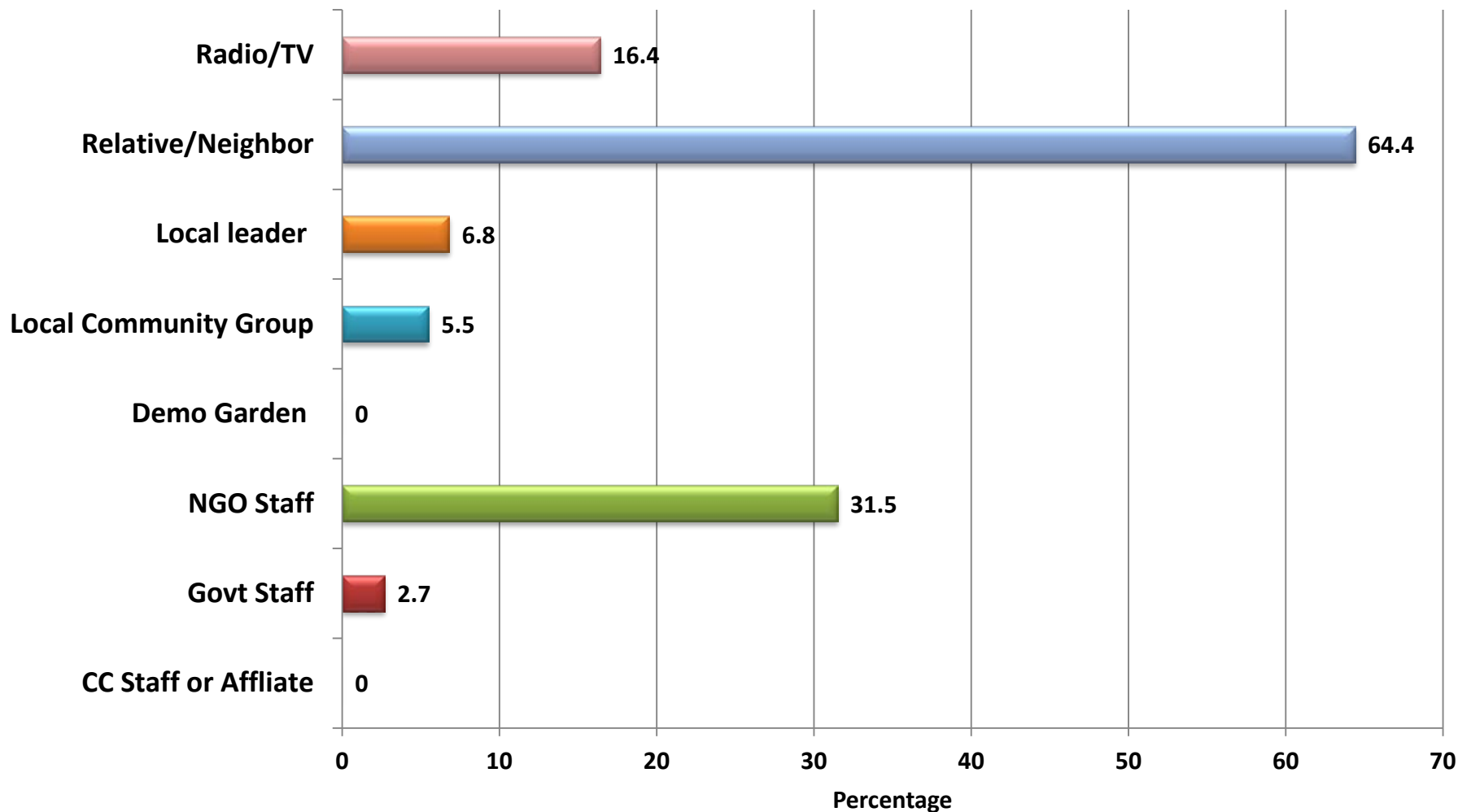
# SOCIAL PARTICIPATION, ACCESS TO INFO. , PROGRAM EXPOSURE

## Bugangari - Receipt of Information or Encouragement to Increase Cultivation of Crops



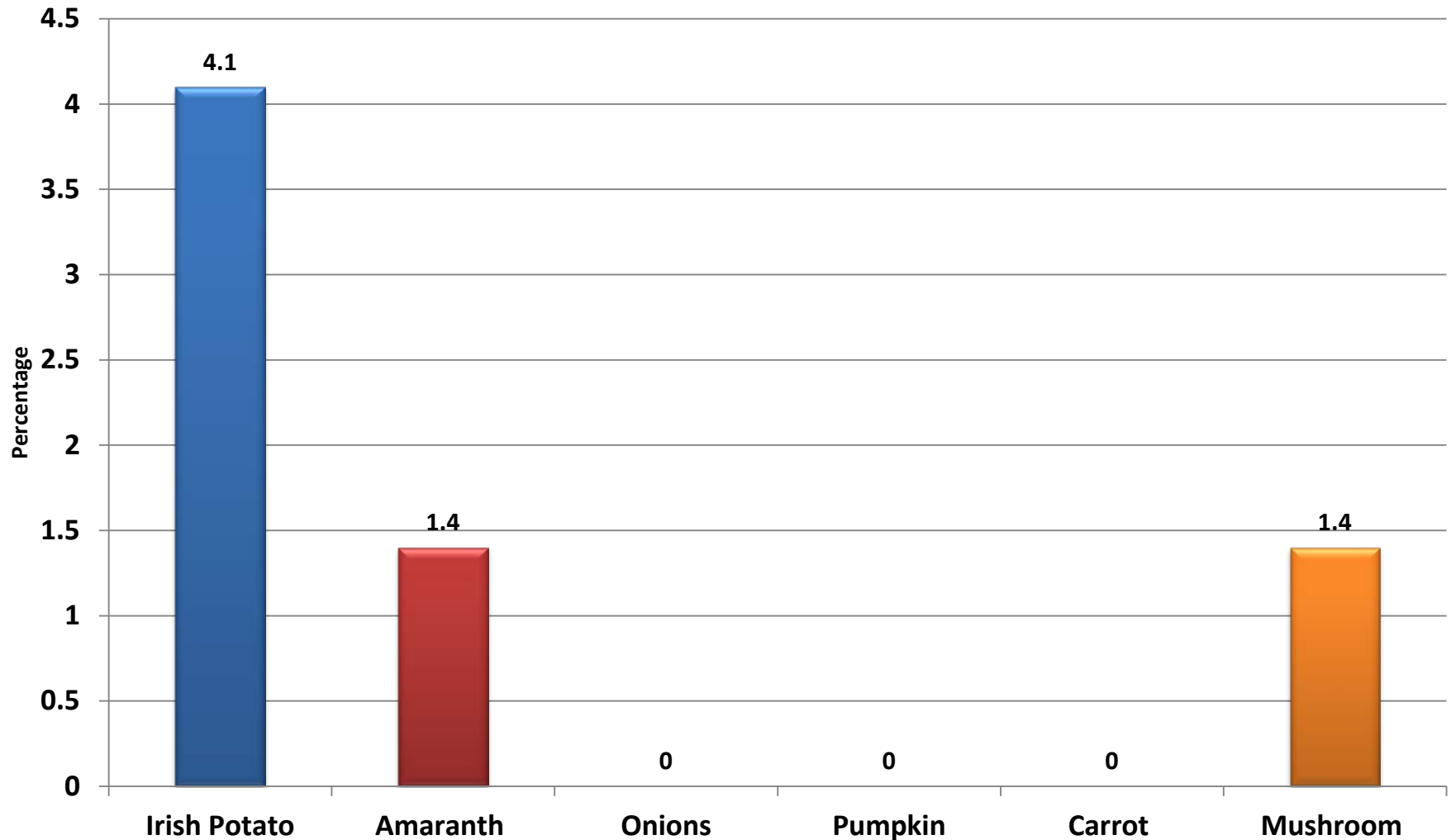
# Social Participation , Access To Info. & Program Exposure

**Bugangari-- Source of Crop Information or Encouragement**



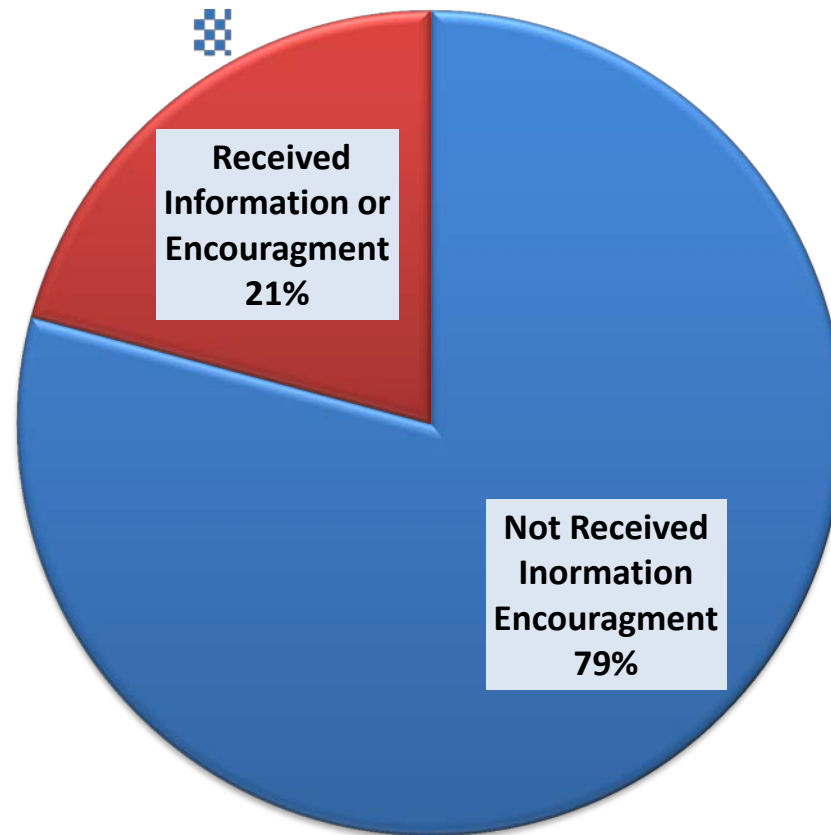
# Social Participation , Access To Info. , Program Exposure

**Bugangari -Crops Households were Encouraged to Produce**



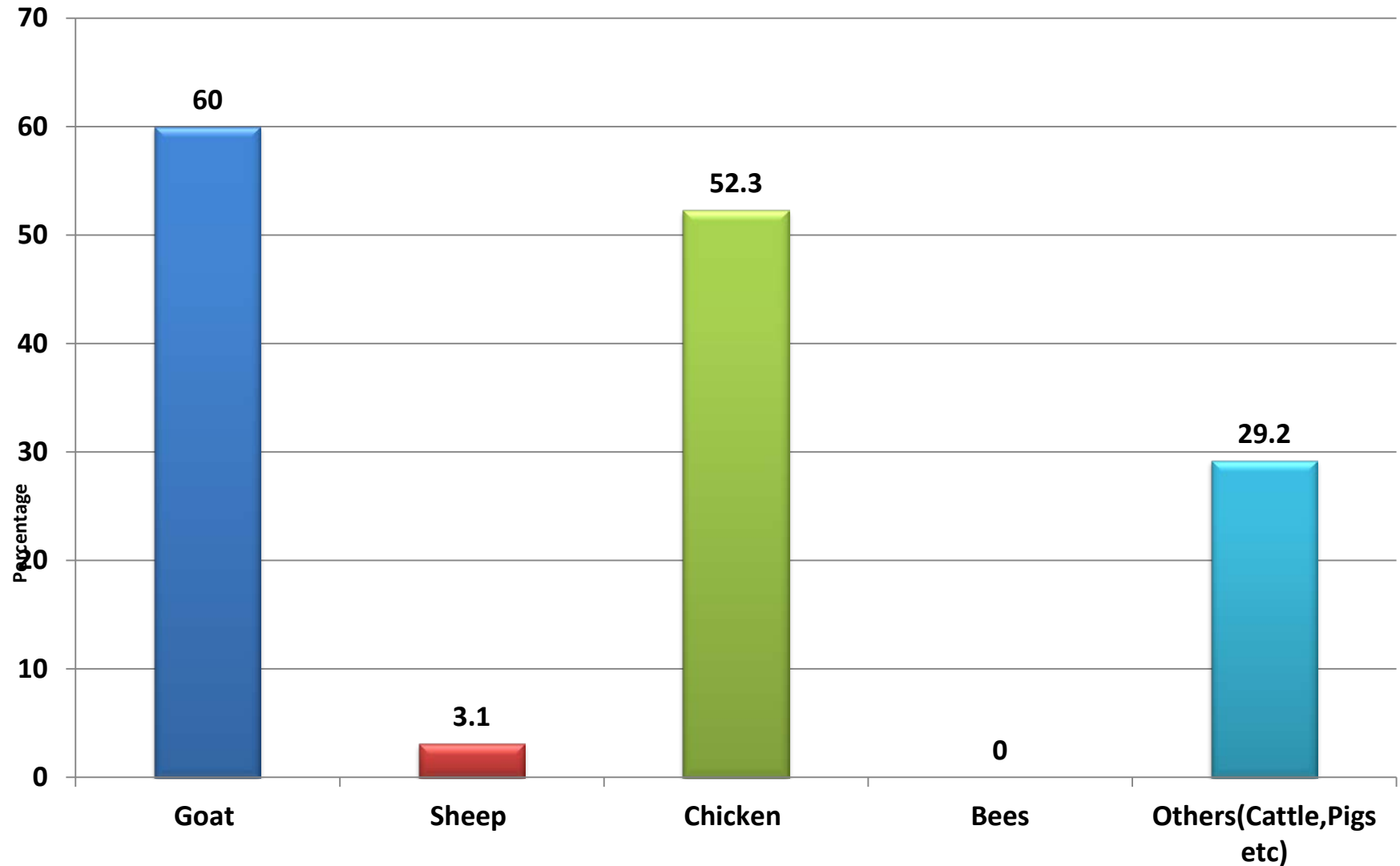
# SOCIAL PARTICIPATION, ACCESS TO INFO. , PROGRAM EXPOSURE

**Bugangari - Receipt of information or Encouragement to Rear Certain livestock**



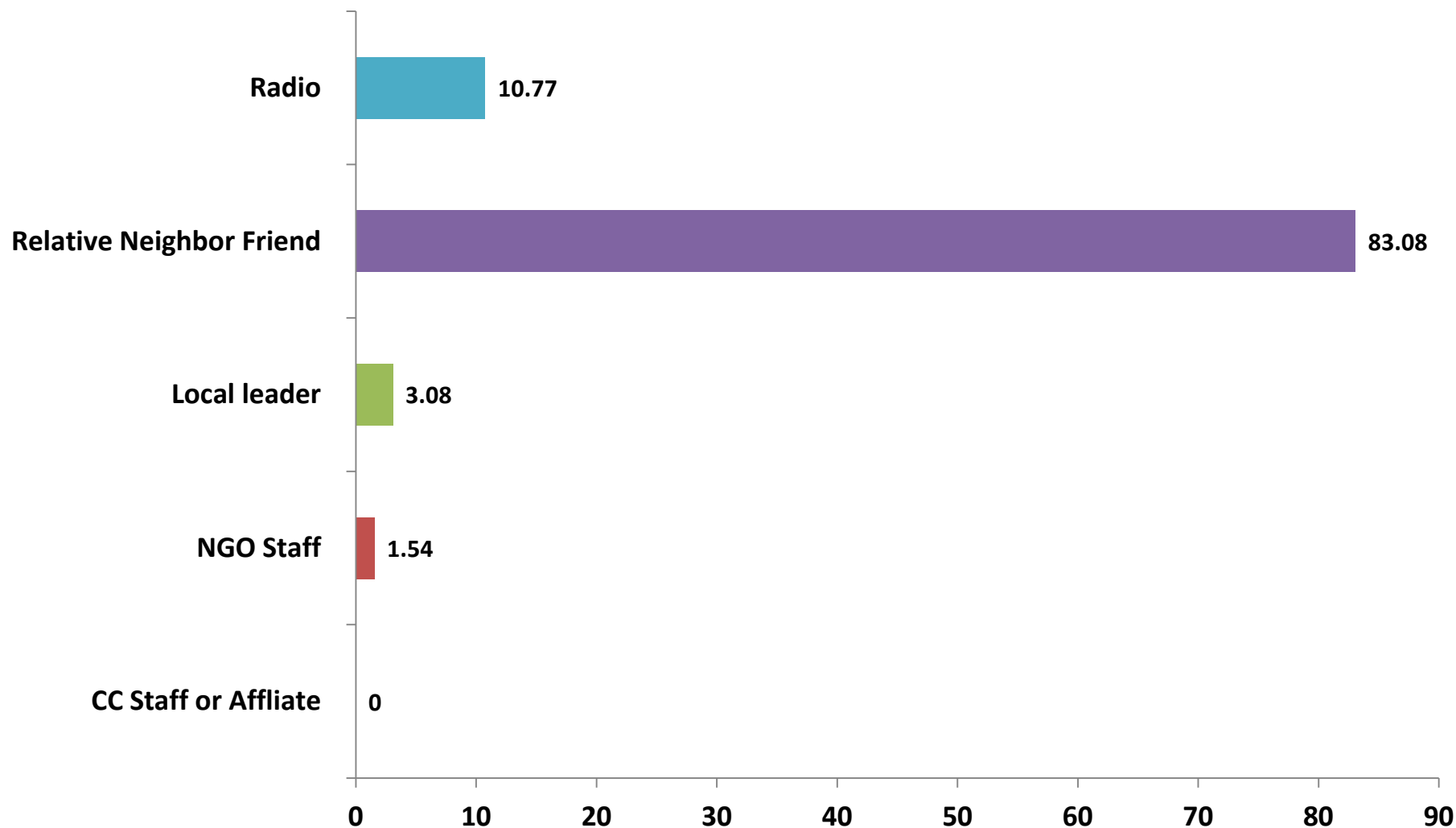
# Social Participation , Access To Info. , Program Exposure

**Bugangari - Livestock that Households were Encouraged to Rear**



# Social Participation , Access To Info. , Program Exposure

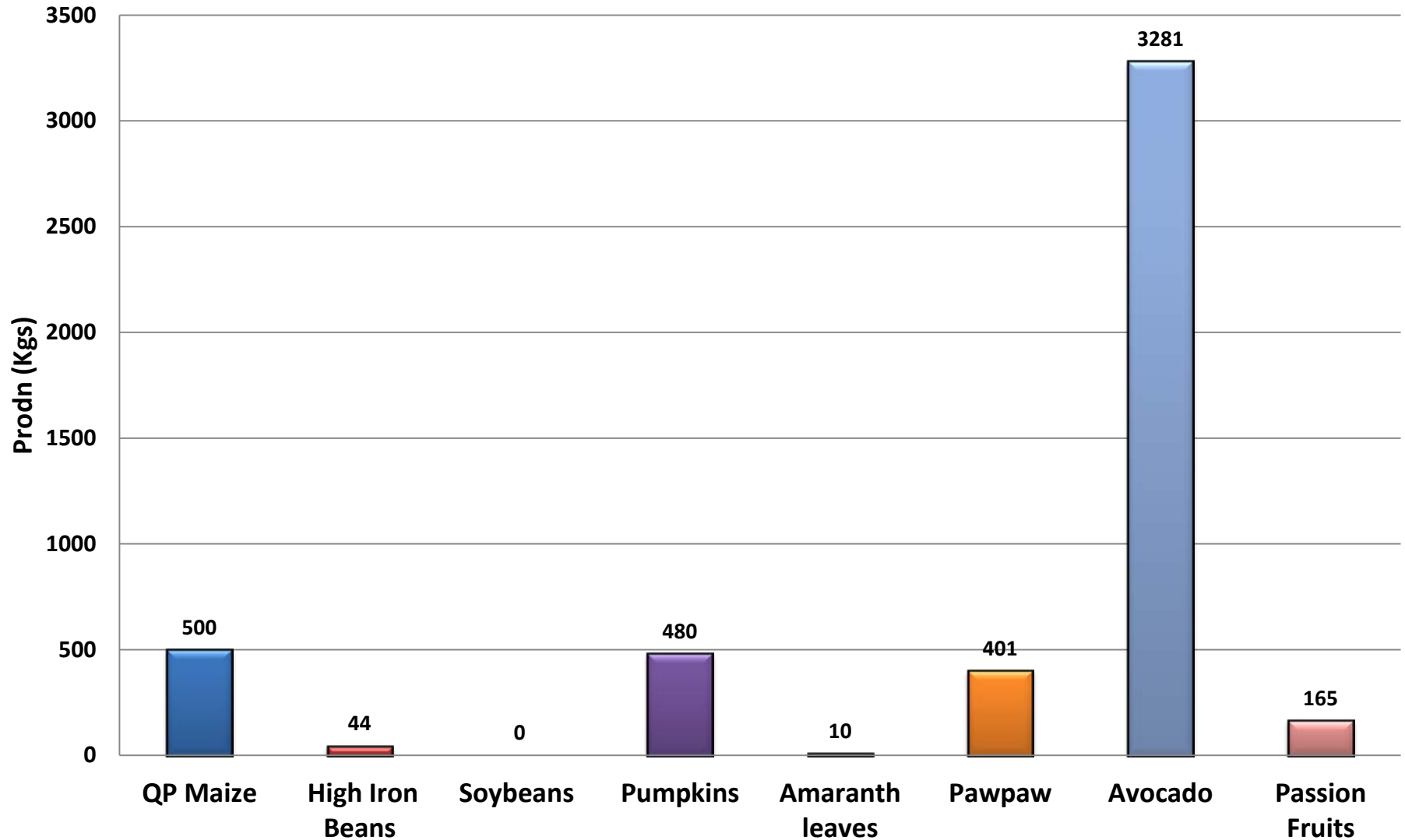
## Bugangari- Source of Information or Encouragement to Rear Livestock





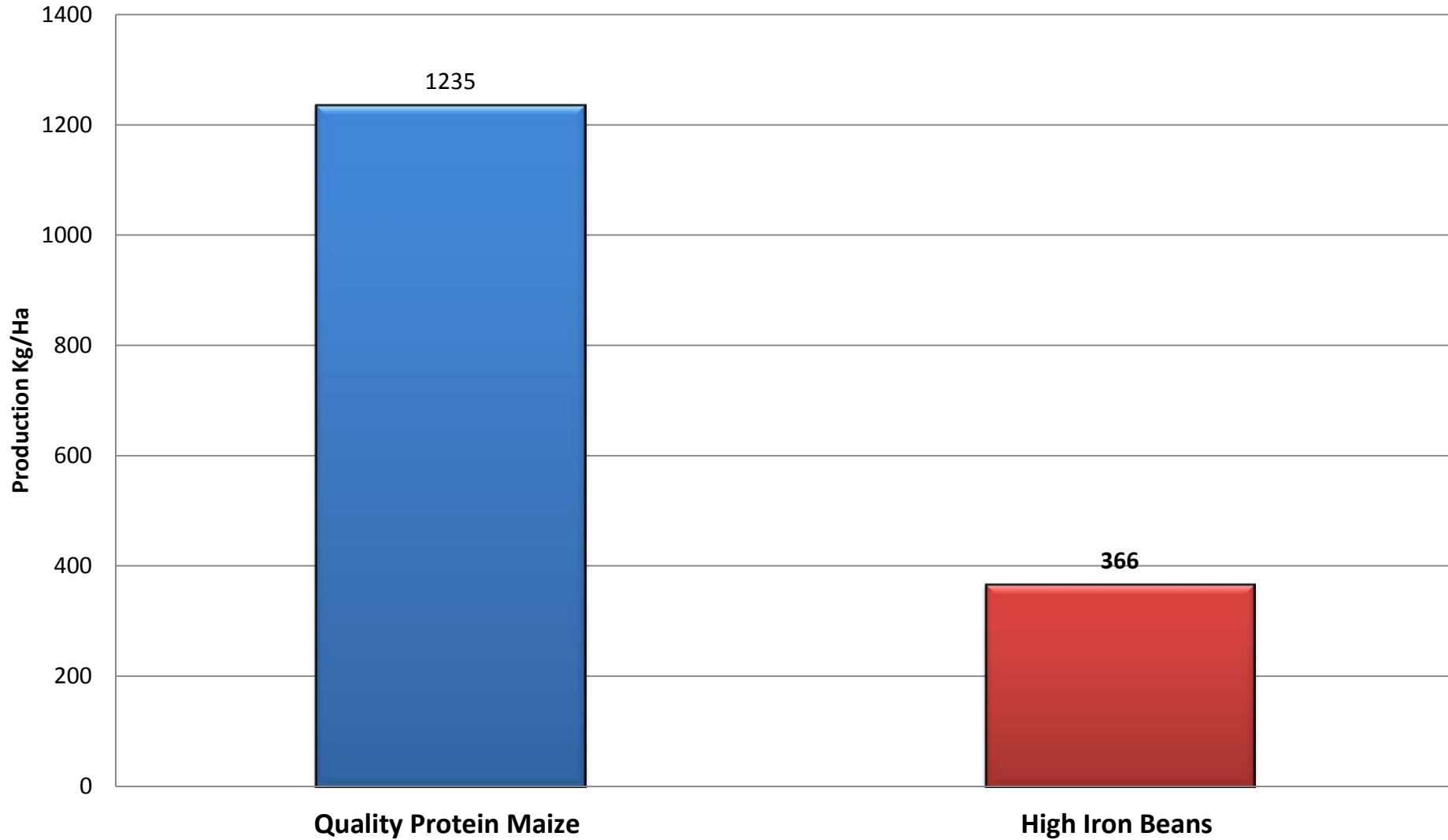
# AGRICULTURAL PRODUCTION

## Bugangari- Production of Key Nutrient Sensitive Crops



# AGRICULTURAL PRODUCTION

## Bugangari-Production (Kg/Ha) of Selected Nutrient Sensitive Crops



# AGRICULTURAL PRODUCTION

**Bugangari -Percentage of Households Using Varouis Technologies/  
Practices**

