



# Water Solutions for Batipa

Panos Argyrakis, Nate DeSisto, Domenica Ferrero, Marcelino Puente-Perez



# Methodology

## **Objective I:**

Understanding  
Batipa's  
sustainability  
challenges

## **Objective II:**

Survey and  
record critical  
information  
and  
infrastructure  
data about  
Batipa

## **Objective III:**

Develop  
a holistic  
water  
system  
for the  
Cabimos  
area

## **Objective IV:**

Create an  
educational  
rainwater  
harvesting  
model

# Findings & Analysis

## Wells

More stable/predictable than rainfall

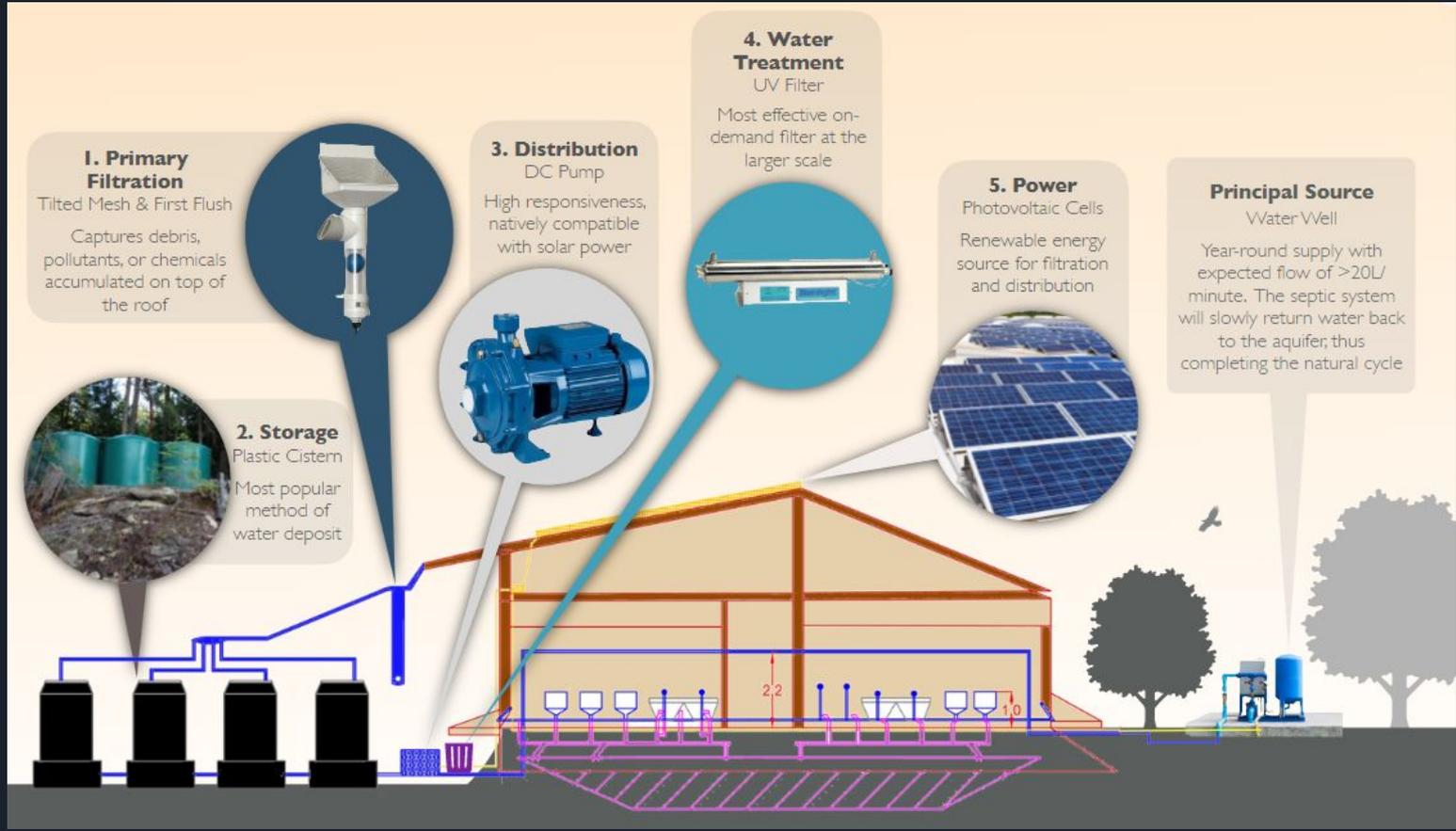
Complement to rainwater systems

Industry proven, with 43 million people relying on wells in the US



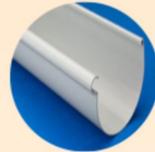
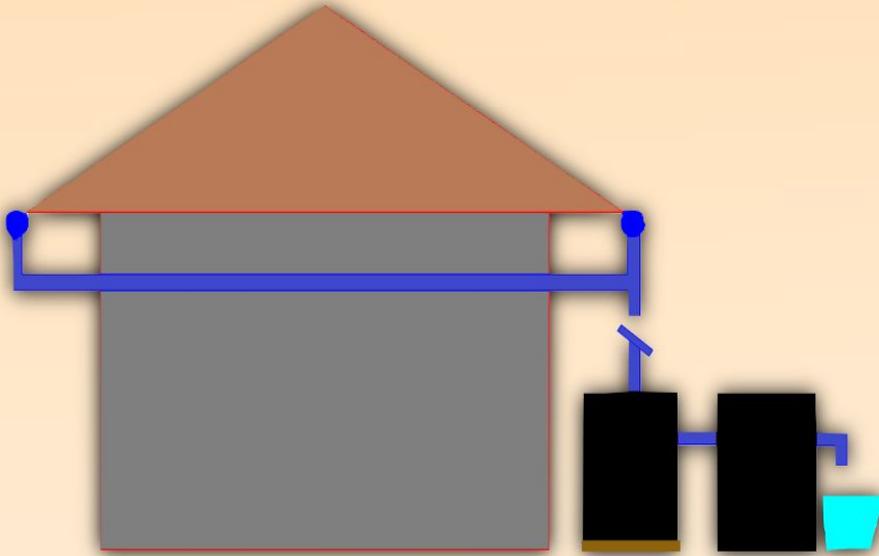
# Findings & Analysis

## Design Concept for Cabimos



# Findings & Analysis

## Basic Rainwater Harvesting Model



**1. Catchment & Conveyance**  
PVC Piping and Gutters

An inexpensive yet effective way to collect water for small to medium scale buildings



**2. Primary Filtration**  
Tilted Mesh

Filters out large particles, such as leaves, from the water source. In addition to its low cost, there is little maintenance needed



**3. Storage & Second Filtration**  
Rain Barrells

An affordable and practical option for water storage



**4. Water Treatment**  
Colloidal Silver Filter (CSF)

CSF is a silver-lined clay pot. As water travels through this porous material, pathogens in the water adhere to the walls, and thus filtering it out

# Recommendations

## Solar Farm for Cabimos

- 1-1.5 hectares of land
- 1MW of electricity
- 300 Panamanian homes
- \$1M USD

International Renewable Energy Agency

Matahar Kencana Solar Farm



# Recommendations

## Implement weather station

- Measure local climate change and weather patterns
- Cost-efficient and environmentally conscious
- Raspberry Pi data collection



# Recommendations

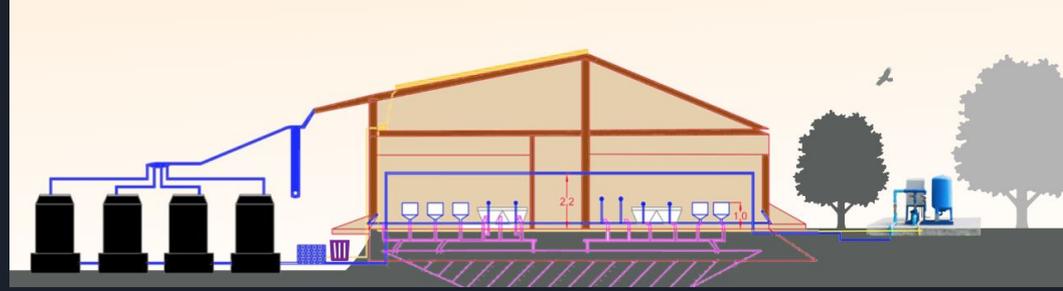
## Increase capacity of Cerro Batipa reservoir

- Rainy season
  - Increase pumping rate
- Dry season
  - Measure salinity



Picture of pond reservoir; used for illustration purposes

# Conclusions



## Key Points

- BFI can support 10 people living there and 100 weekend visitors by using a combination of solar energy, rainwater harvesting and well water
  - 5,000 L/day expected consumption, 2,400 L/day RWH supply during rainy season
- By using scalable storage systems, BFI can start with lower capacity and grow as needed

## Future areas of research

- Determine the expected productivity and water quality of well water at Cabimos
- Further investigate constructed wetlands as an alternative waste management method

Thank You!

The background features a series of parallel, dark grey lines that create a sense of depth and perspective, receding towards the right. A bright green trapezoidal shape is positioned above the text, and a bright blue trapezoidal shape is positioned below it, both appearing to be part of the layered geometric structure.