Amreta Max Win

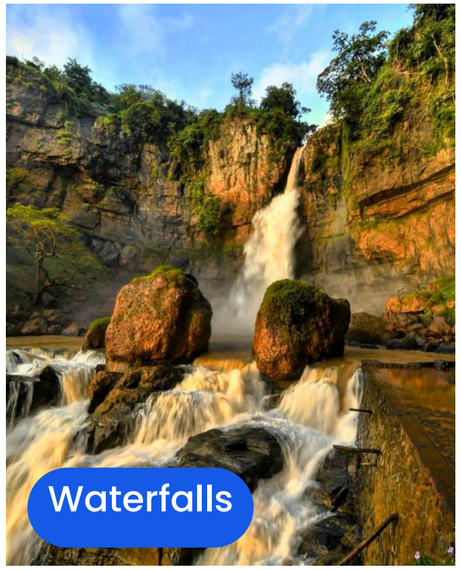
Ciletuh Geopark: Nurturing Nature, Quenching Thirst - Innovating Solutions to Irrigation Challenges!

Amreta Max Win

Geopark Ciletuh

Location

Geopark Ciletuh, as a UNESCO Global Geopark, Geopark Ciletuh as a conservation area that preserve flora and fauna such as Raflesia Arnoldi. Geopark Ciletuh is located in the southwest of Sukabumi Regency, West Java, Indonesia. It covers an area of 126,000 ha or 1260 km2 which covers 8 sub-districts and 74 villages.



Paddy Fields

Based on the Regional Spatial Planning of the Sukabumi Regency, The Ciemas District is designated as the center of the agricultural secor activities for paddy rice plants in the Sukabumi Regency.

8.048 hectares of paddy fields

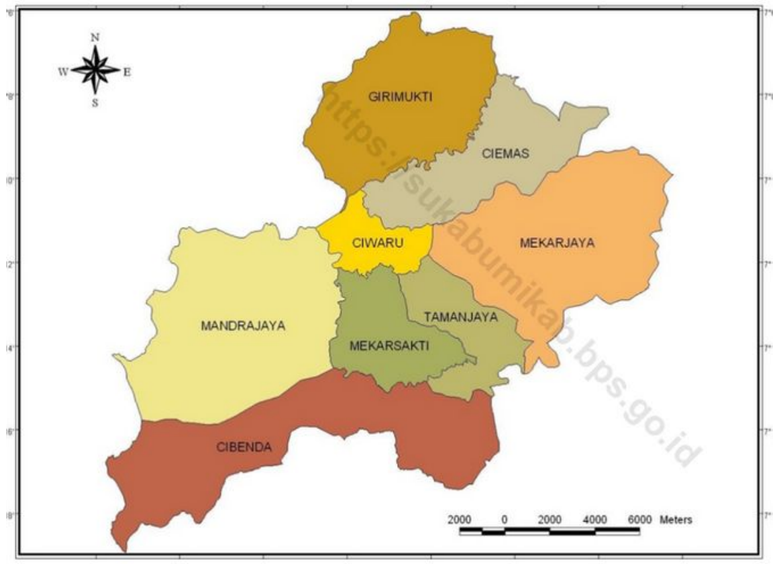
over 80% of the community relies on agriculture as their primary source of income.

rice production reached 40,390 tons in 2020

Amreta Max Win

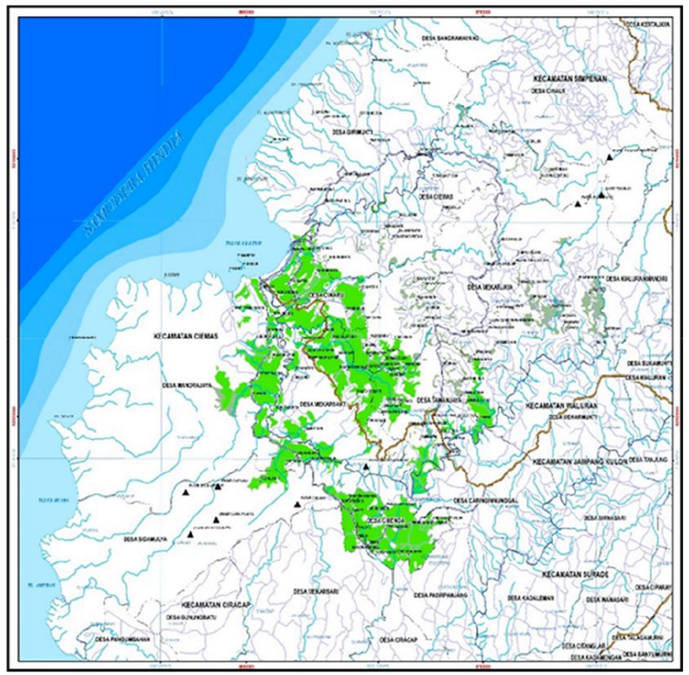
Distribution of Paddy Fields in Ciemas District

Map of Sub-Districts in Ciemas District

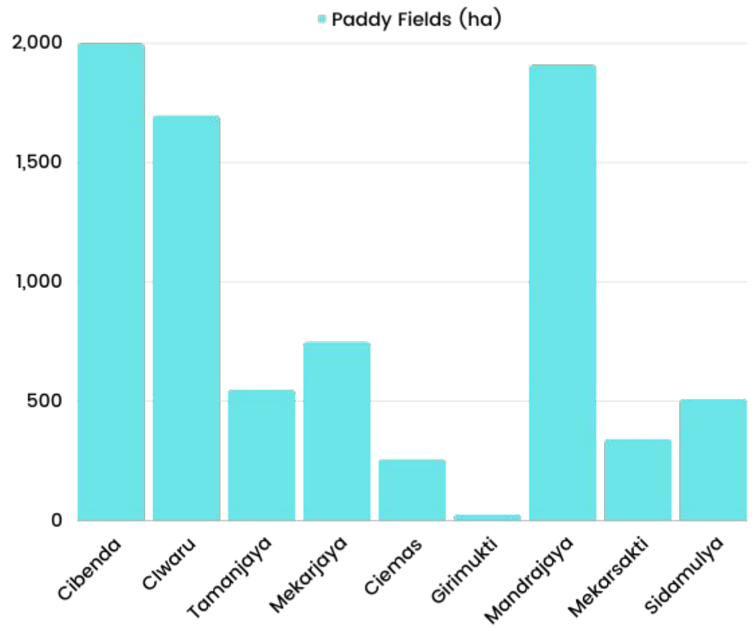


Source: Badan Pusat Statistik

Distribution of Paddy Fields in Ciemas District



Source: Badan Pusat Statistik

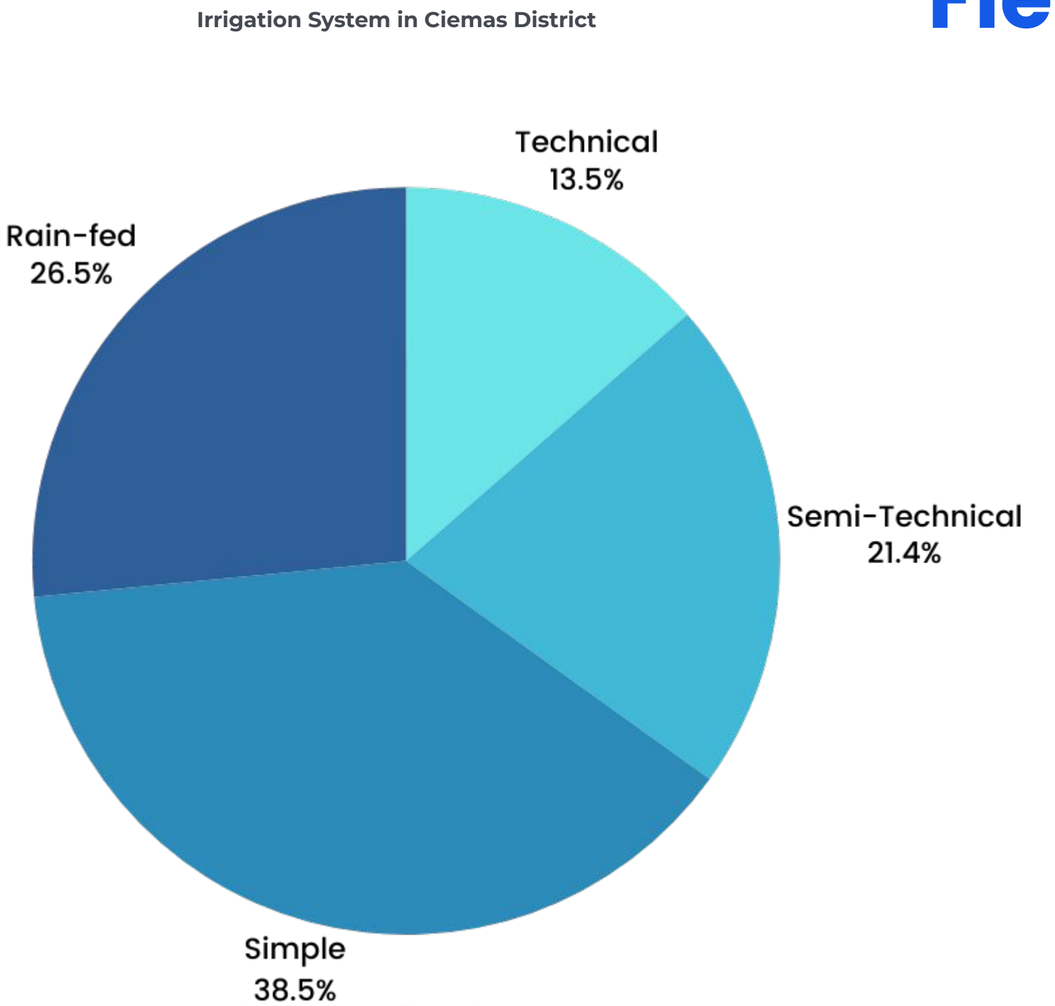


Source: Badan Pusat Statistik

In the year 2022, the Ciemas subdistrict having a total of 8.048 hectares of paddy fields. With the highest proportions were found in the villages of Cibenda, comprising 2.000 hectares, followed by Mandrajaya with 1.910 hectares, and Ciwaru covering 1.700 hectares

Amreta Max Win

Irrigation System of Paddy Fields in Ciemas District



Source: Badan Pusat Statistik

01 65% of paddy fields use conventional irrigation practices

02 Mainly sources from nearby rivers and rain water

03 Paddy fields having no monitoring system

Amreta Max Win

Climate Change

Home > Rejabar > Holy

Friday 19 Nov

Flooded with Rain, Six Points in Ciem Sukabumi Flo

ANTARA > Ekonomi > Bisnis > Ratusan hektare lahan pertanian di selatan Sukal

Ratusan hektare lahan pertanian di selatan Sukabumi kekeringan

Kamis, 11 Juli 2019 17:48 WIB

BPBD: 174 titik di Sukabumi sudah dalam kondisi kekeringan

Rabu, 25 September 2019 19:56 WIB

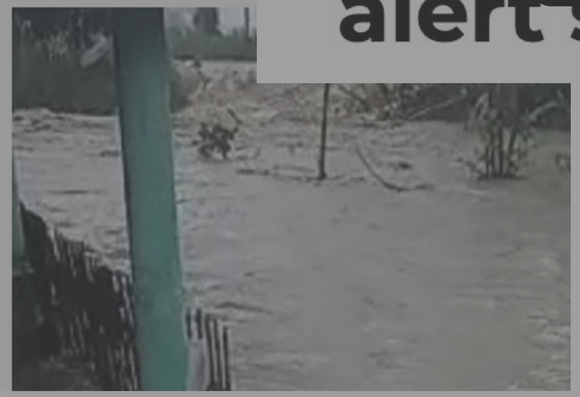
Home Aceh North Sumatra South Sum

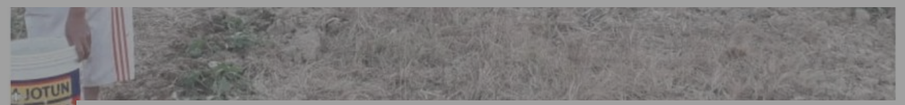
Area / West Java / New

12 Hour Sukabu

Dharmawan Hadi- 1

alert status for drought





Dozens of Hectares of Rice Fields in Ciemas Sukabumi Drought

June 22 2019 10:30 WIB ® Kiki

1 Meter Flood Submerges Ciletuh Geopark Road in Ciemas Sukabumi, Traffic Paralyzed

Dharmawan Hadi- Saturday, 20 November 2021 - 12:46:00 WIB

Home > Current Issue > Sukabumi put under emergency alert status for drought

Sukabumi put under emergency alert status for drought

Share

Amreta Max Win

Climate Change

Climate change have significant effects on the patterns of extreme wet and dry seasons, impacting the irrigation of paddy fields and their crop yealds

01 Extreme Dry Season

- Disruption of water availability
- Increase risk of drought for irrigation channels.
- often occurs in:
  - Mekarsakti Sub-District
  - **Cibenda Sub-District**
  - **Mandrajaya Sub-District**
  - Girimukti Sub-District
  - Sidamulya

02 Extreme Wet Season

- Increase the vunerability of floods
- Based on the flood risk analysis, 46.36% is a flood-prone area.
- Damage irrigation land area
- often occurs in:
  - **Mandrajaya Sub-District**
  - Mekarsakti Sub-District
  - Tamanjaya Sub-District
  - **Cibenda Sub-District**

Amreta Max Win

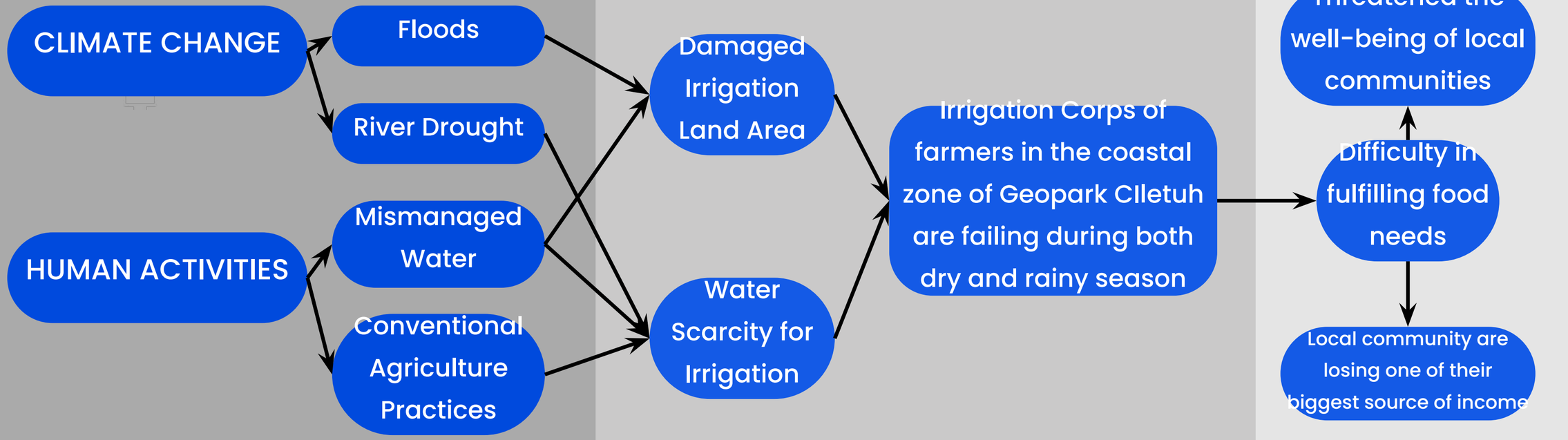
Impacts

Irrigation Corps of farmers in the coastal zone of Geopark CIletuh are failing during both dry and rainy season

Difficulty in fulfilling food needs → Local community are losing one of their biggest source of income → Threatened the well-being of local community

Amreta Max Win

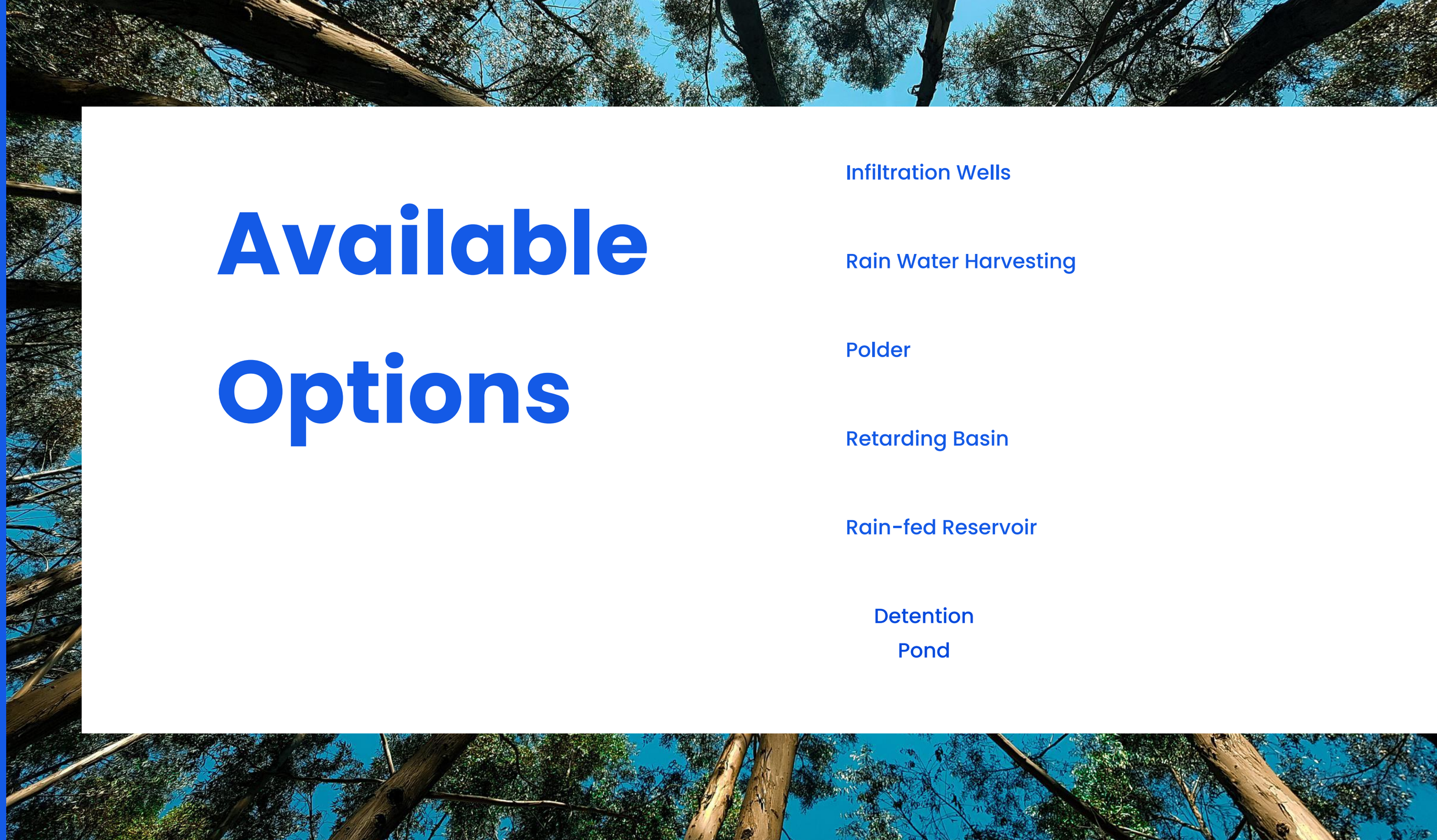
Problem Tree



Amreta Max Win

What do we need?

Amreta Max Win



Available Options

Infiltration Wells

Rain Water Harvesting

Polder

Retarding Basin

Rain-fed Reservoir

Detention Pond

Amreta Max Win

Our Criteria

Cost

Impact

Lifetime

Stakeholder

Constructio
n

Legislation

L.A.

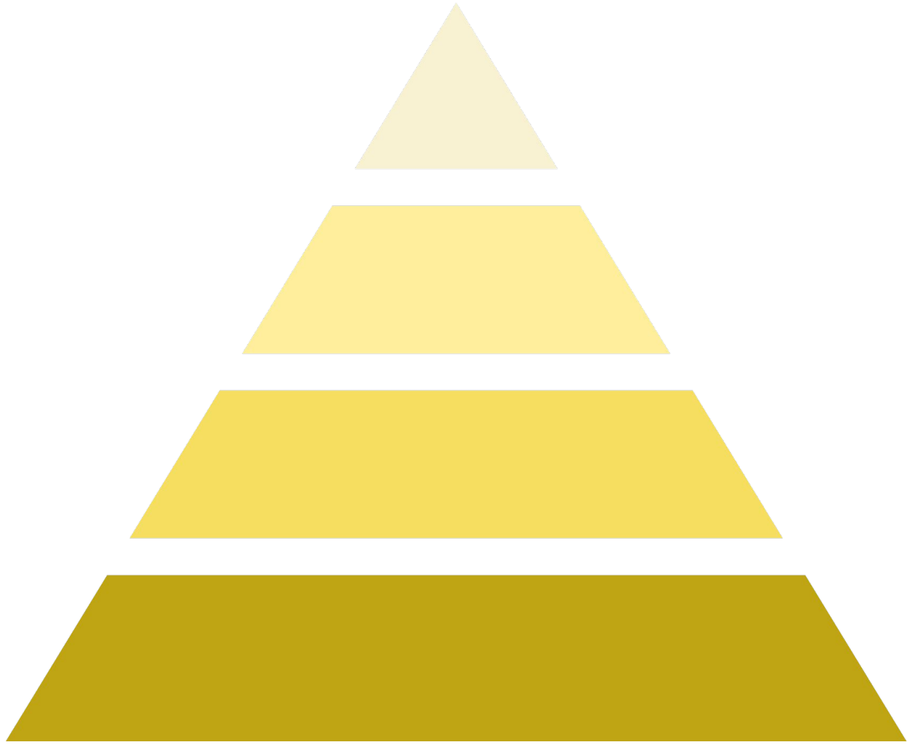
Sustainability

Operations

Maintenance

Amreta Max Win

Decision Making Tools: The Analytical Hierarchy Process



WHAT

Choice Architeture

WHY

A Proven Formula

HOW

Rank Priority

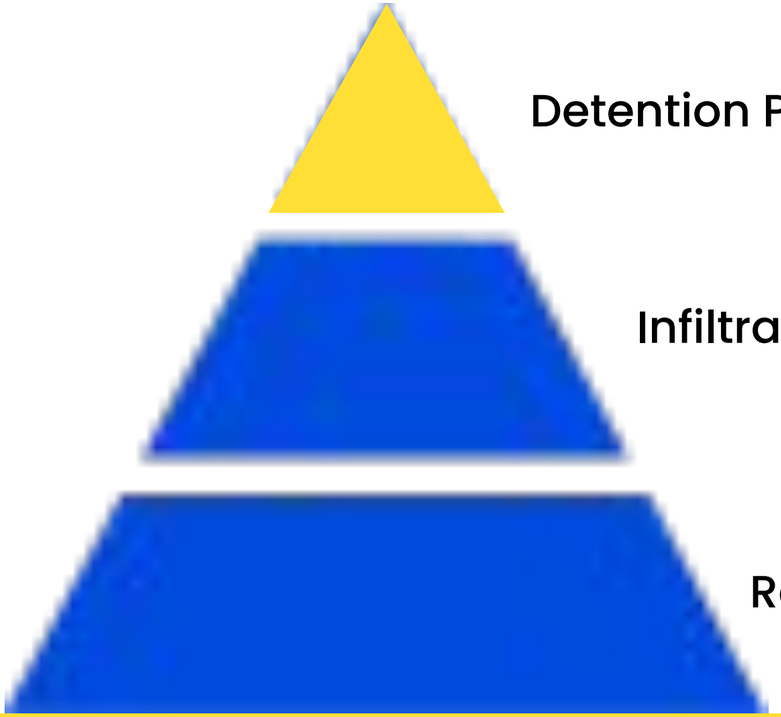
Results

1. Detention Pond
2. Infiltration Wells
3. Rain Water Harvesting
4. Retarding Basin
5. Rain Fed Reservoir
6. Polder

Amreta Max Win

Detention Pond:
The Right Priority?

Based on top three priorities:



Detention Pond

Infiltration Wells

Rain Water Harvesting

Compared to two other options, detention pond has the largest storage

- **More water stored during wet season**
- **More water that can supply irrigation during dry season**

Amreta Max Win

Detention Pond:

The Ultimate Answer?

Average discharge on October-March is

16,10 m^3/s

wet season

on April-September

4,37 m^3/s

dry season

While the average discharge on the nearest watershed are only

8,06 m^3/s *wet season

2,12 m^3/s *dry season

Related Articles

2nd International Conference on Sustainable Infrastructure IOP Publishing
Journal of Physics: Conference Series **1625** (2020) 012046 doi:10.1088/1742-6596/1625/1/012046

Development of Sustainable Detention Ponds for Flood and Sediment Control in Urban Areas

S Suripin, S Darsono, D Kurniani, W F Hutagalung and D V Dintia

Civil Engineering Department, Diponegoro University, Semarang-Indonesia
Corresponding author: suripin.ar@gmail.com

Abstract. Muddy floods often occur in Indonesia as a side effect of urban development. Flood and sediment control facilities have been so far developed separately. Flood is controlled by reservoirs, while sediment is trapped by checkdam. The objective of this paper is to develop an integrated system between flood control and sediment trap analytically. The system consists of detention pond equipped with perforated spillway tower. Optimization is carried out on the dimensions of spillway tower, the diameter, number and layout of perforation orifices to obtain the highest trapped sediment and flood peak reduction for a certain pond capacity. The research was conducted in the Meteseh sub-watershed, located in Semarang. The results indicated that the position and arrangement of the orifices in the spillway tower affect sediment trap, while their size and number affect the reduction in peak discharge. The proper size, number, posistion and arrangement of orifices on the spillway tower be able to trap sediment and reduce flood discharge as high as 80%, and 24% consecutively.

Keywords: detention pond, flood control, perforated spillway tower, sediment trap

Evaluation of the Feasibility of Irrigation Storage in a Flood Detention Pond in an Agricultural Catchment in Northern Italy

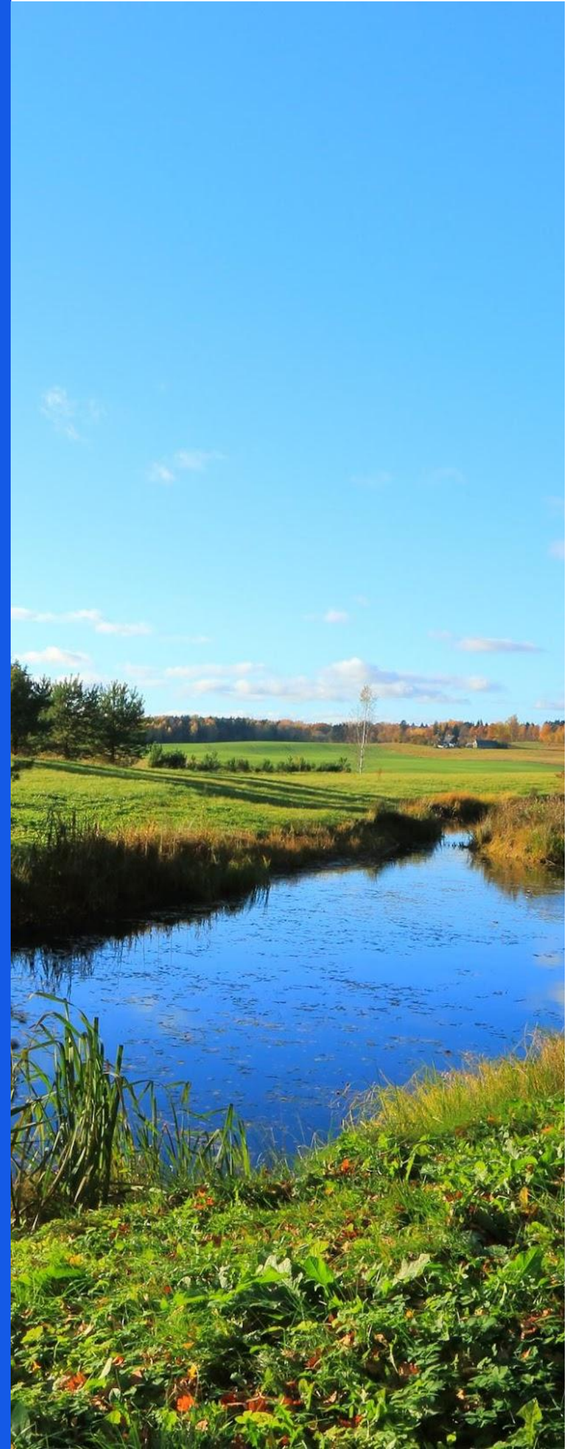
Erica Camnasio · Gianfranco Becciu

Received: 21 April 2010 / Accepted: 5 December 2010

Abstract During recent years, the international attention paid to rational use and saving of water has increased, partly because of frequent water shortages occurring also in countries not usually involved in these problems, and partly as a consequence of rising conflicts on water allocation. Hence it is important to find new surface-water volumes satisfying agricultural water demand, as well as new ways and areas to store them. The simulation model presented by the paper enables evaluation, in a phase of design feasibility analysis, of whether a flood detention pond can be adapted to act as water storage during irrigation periods in order to reduce agricultural water shortages; it simulates detention pond response to floods and droughts under different hydraulic conditions and reservoir management rules. The first policy goal of the model is to maintain the stored volume within the maximum admissible for flood safety. The second goal is to maintain at the same time a minimum flow in the river and to satisfy irrigation water demand. The model, implemented in a purpose-made simulation software, was applied to an Italian river in the Emilia Romagna region: the results demonstrate that the use of a flood detention pond as an irrigation reservoir is not only possible, if it complies with the operating rules that emerge from this study, but also it brings tangible benefits in reducing agricultural water deficit.

Is It Feasible?

Amreta Max Win



Detention Pond: Advantages & Drawbacks

Flood Control

Detention ponds work as temporary sponges for rain. They hold onto stormwater during downpours.

Huge Storage

Its capacity depends on several factors like size, depth, and design, but some can hold millions of gallons. Storage power plays a crucial role when it comes to dry season.

Cost

Detention ponds can be expensive to build and maintain, especially large ones. The cost of land, excavation, materials, and ongoing upkeep can quickly add up,

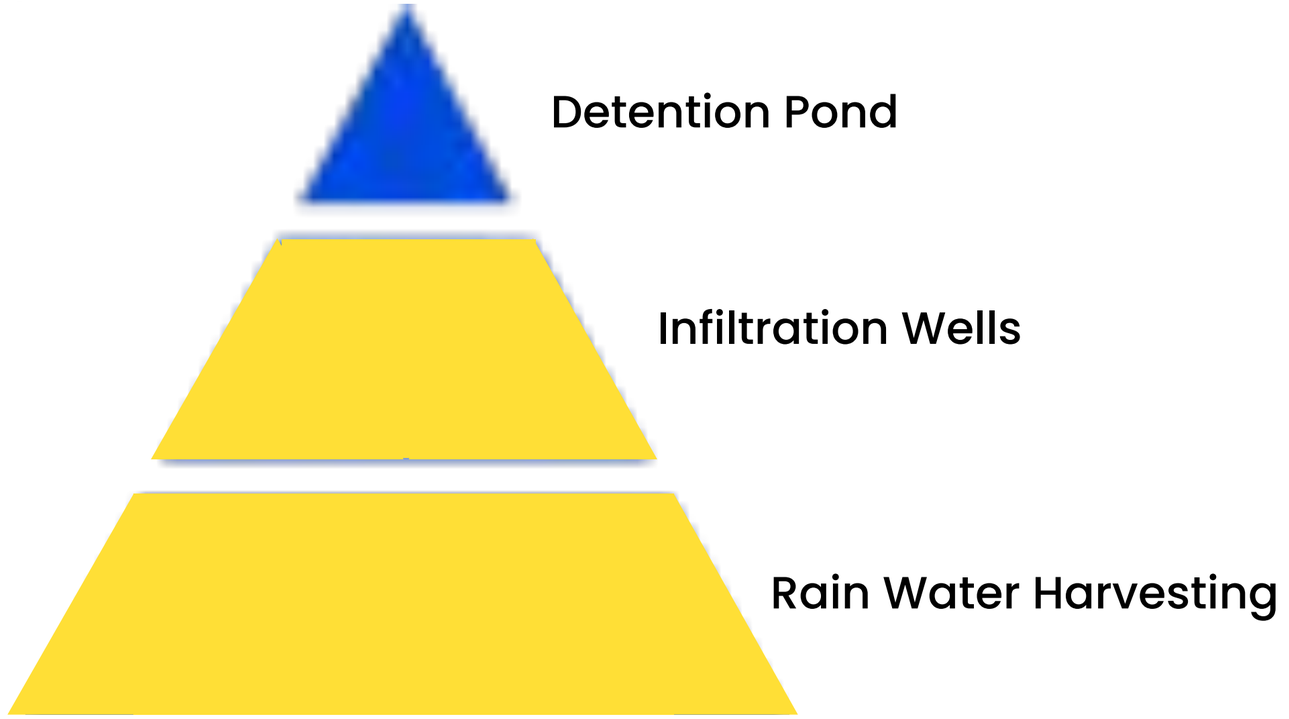
Land Acquisition

While great for flood control and water quality, it needs plenty of spaces. This can be an issue and needs plenty of time to research further. This may not visible for nearest time.

In conclusion, detention ponds offer the solution needed to reduce flooding. The large storage capacity can also provide a solution to water shortages during the dry season. However, in the near future, this solution is facing major challenges to implement due to the **high cost** and **land acquisition permits**.

So, What to implement?

Based on top three priorities:



Amreta Max Win

Maximizing Solution

More Efficient Water Use

Precision Irrigation System

Imagine **saving water, nurturing every plant**, and **boosting profits**, all with laser-focused irrigation. That's the power of precision, a game-changer for farmers and the planet.

Long Term Investment

Local Empowerment

Investing in local voices builds **lasting solutions** – empowered communities become **architects of their own progress.**

Combined with precission irrigation system

STakeholderr, local organization, and local community

Water Education and Water Behavior

Detention Pond

First Phase

Second Phase

Infiltration Wells and Rainwater Harvesting

Final Phase

"None of us is as smart as all of us."

- Ken Blanchard

Amreta Max Win

Phased Solution

2024

Research and Planning

Describe the products development timeline phase by phase in detail and effective.

2025

Promotion and Activation

Describe the products development timeline phase by phase in detail and effective.

2026

Planning New Variety of Product

Describe the products development timeline phase by phase in detail and effective.

2027

Monitoring and Evaluation

Describe the products development timeline phase by phase in detail and effective.