



ACT IN SPACE – 2023 – CHALLENGE AIRBUS N°5

VETITECH

USING **VETIVER** TO FIGHT AGAINST SOIL EROSION
IN TROPICAL ZONES IN A **SUSTAINABLE** WAY



A BIT ABOUT US



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- Data Scientist
- Currently working at the European Space Center
- French Guiana



Lucas BONNIE

- Agricultural Engineer
- Worked as a Vetiver project manager in Madagascar
- French Guiana

THE PROBLEM :

33% OF SOILS WORLDWIDE ERODED (source FAO: Food and Agriculture Organization)
UP TO 1000 YEARS TO CREATE 1CM OF SOIL

PAVEMENT COLLAPSE ON THE RN1 IN FRENCH GUIANA

Around 25k€ / km / year are spent annually on the maintenance of national roads in French Guiana

HOW CAN WE MINIMIZE THE ECONOMICAL AND ENVIRONMENTAL COSTS OF THE ROAD MAINTENANCE IN TROPICAL CLIMATE ?



OUR SOLUTION :

THE VETIVER ...

VETIVER, A PLANT WITH MULTIPLE BENEFITS:

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- Erosion control
- Production of biomass
- Carbon sink : 53 T CO₂/Ha
- Soil decontamination

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- The **densest root system in the world**
- **Rapid growth** (plant C4)
- Non-invasive plant

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- Totally safe for drivers
- Easy to plant
- And it smells good!!



Slide 4

LB0 BIOLOGIQUE - ENVIRONMENTAL - SOCIAL

Lucas BONNIE, 2023-02-09T18:41:15.144

LB1 Pourquoi est ce que ce n'est pas déjà fait ?

Lucas BONNIE, 2023-02-09T18:41:45.208

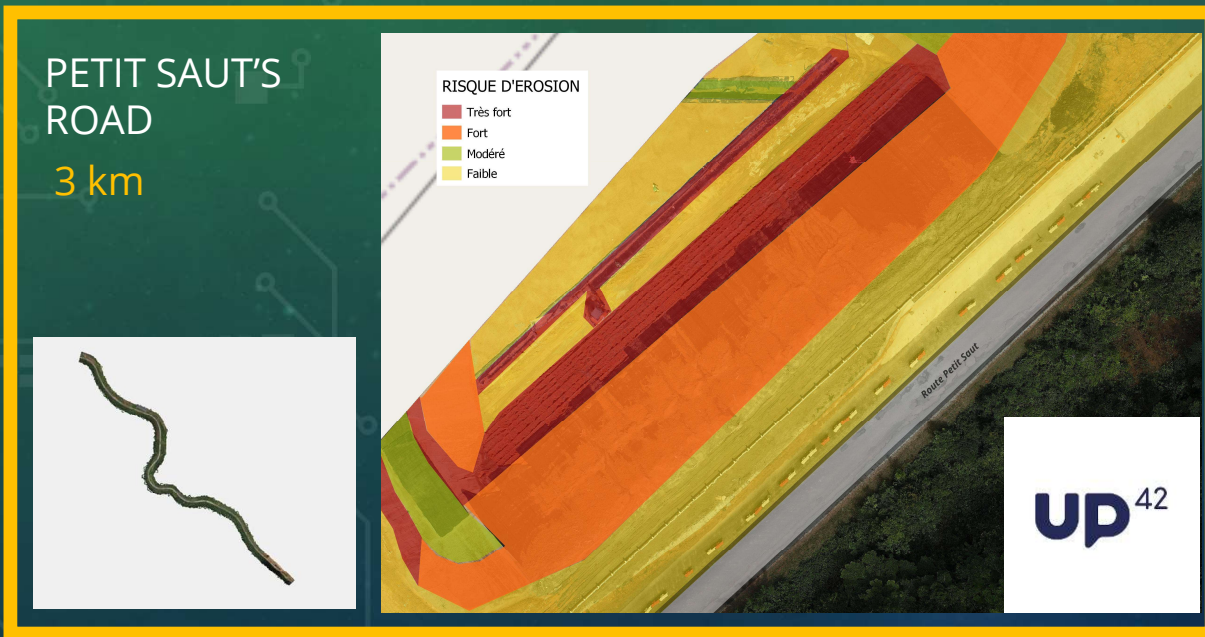
LB2 C'est quoi les désavantages ?

Lucas BONNIE, 2023-02-09T18:45:57.071



3 meters

...COMBINED WITH AI = VETITECH



UP 42 Pléiades Neo



UP42 CHANGE DETECTION ALGORITHM:

- To detect Roads edges



DEEP LEARNING MODEL

- To prioritize soil erosion risks using:
 - Elevation data
 - Hydrological data
 - Geological data



AUTOMATIC QUOTATION:

- Total Planting costs :
 - Number of vetiver plants
 - Number of rows to be planted
 - Calculation of CO2 saved

Slide 6

LBO

En quoi c'est de l'AI ?

Lucas BONNIE, 2023-02-09T18:46:17.131

BUSINESS MODEL

TARGET: CONSTRUCTION COMPANIES AND PUBLIC MARKET

AUDIT

- Priorization of areas to plant
- Automatic quotation

1 900 €/Km

PLANTATION

- Vetiver nursery
- Transport
- Site set-up
- Biomass harvest
- Certificate of compliance

290 000 €/1 Ha

INSTALLATION STONEWORK

900 000€/1 Ha



3 times more expensive

LOW CARBON LABEL

- Possibility of grant
- New European legislation 2020: CSRD (Corporate Sustainability Reporting Directive)

FINANCIAL APPROACH

Previsionnal	Sales figures	Expenses + Wage bill	Benefits
2023 – 1 Ha	290 000	425 940	- 135 940
2024 – 10 Ha	2 900 000	2 700 540	199 460
2025 – 20 Ha	5 800 000	5 112 540	687 460
TOTAL	8 990 000	8 239 020	750 980

FINANCIAL NEED

200 000 €

STARTING INVESTMENT EXPENSES

- Working force
- Office
- Nursery
- Plantation equipment
- UP42 subscription
- Research and Development
- IT equipment

HIGH TECH COMBINED WITH BIOENGINEERING TO STOP EROSION !

NORMAL PROCESS



- ENERGY CONSUMER
- CO2 EMISSION
- EXPENSIVE

VETIVER PROCESS



- ENERGY SAVER
- CO2 ABSORBER
- NOT EXPENSIVE
- SOCIAL CONTRACTS

VETITECH

T H A N K Y O U !

LB1



Slide 10

LB0 Réconcilier la high tech avec la lowtech

Lucas BONNIE, 2023-02-09T18:53:16.337

LB1 Phrase punchline de fin

Lucas BONNIE, 2023-02-09T18:53:26.834