

A close-up photograph of a dragonfly perched on a green stem. The dragonfly's body and legs are covered in numerous small, clear water droplets. The stem it is on is also covered in larger, glistening water droplets. The background is a solid, vibrant green color.

**Converting Sahara into  
Amazon,** a holistic approach.  
SIMPLE IDEAS & SOLUTIONS, India.

# Concept statement

- To supply Fresh (desalinated) water to all desert ecosystem, from **Algae to Zebra & not only to humans**, by creating “Water vapour farms” above sea.
- Let`s improve **HEALTH** of Sahara desert Eco-system.

# Positive effect due to Global warming.

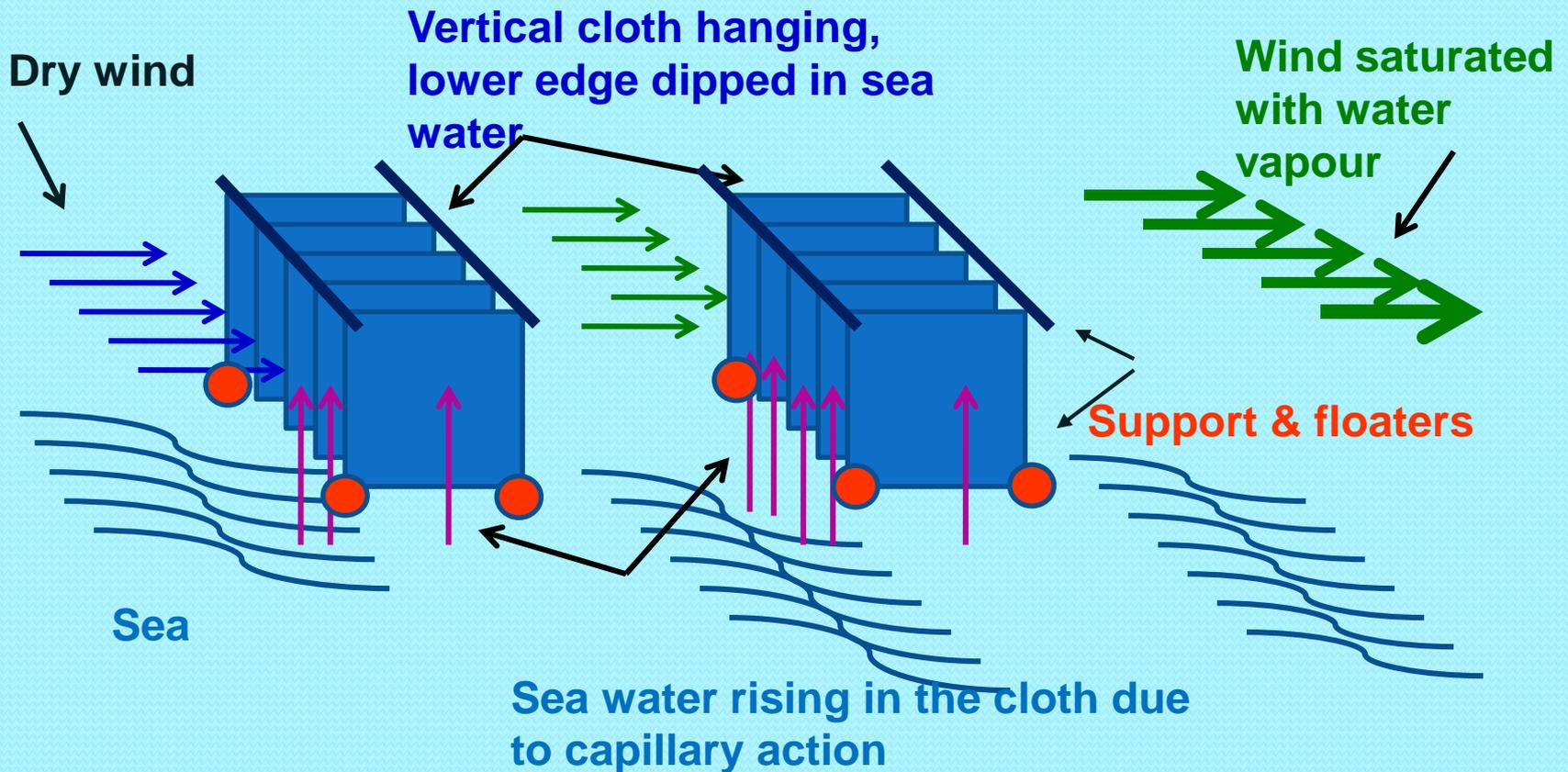


- Global warming is putting more water vapor in to air than earlier.
- This water vapour is condensing over Sahara making it green.
- This is proof of concept for greening Sahara by just increasing humidity. Photo Courtesy National Geographic.

# Value proposition

- From evaporation of water, condensation, distribution even transportation and storage will be done by nature itself.

# Water vapour farm



# How water vapour farm will work?

- Each cloth hanging evaporates about 20 Litres/day of sea water. Thousands of such hangings can be put in sea water.
- ***No cost of evaporation.***
- ***Winds will carry water vapour inside the desert. No cost of transportation.***
- ***Low night temp. and higher humidity will compel air to offload water in the form of dew. No cost of condensation.***

# How water vapour farm will work?

- Till next night most of the water will percolate in to soil and some will again evaporate.
- This water vapour will be further carried in the interior of desert. *No cost of distribution.*
- This hopping pattern will eventually increase water content *in the whole desert eco-system that is air, soil and watersheds.*



# Types of Air wells or dew collectors on community or household basis



**Domestic Dew collector**



**A radiative dew condenser test site at village Kothar in the north-west India near Arabian sea coast by Mr Ramsharan**



**Big OPUR Dew Condenser in Corsica**



**A 550 square metres (660 sq yd) radiative condenser in northwest India**

# Quantification

- The Relative Humidity basics are
- 1000 Litres ( $1\text{m}^3$ ) of air can hold 35 ml of water at  $35^\circ\text{C}$  at 100% Humidity.
- At Night when temp falls to  $8^\circ\text{C}$ , 1000 liters ( $1\text{m}^3$ ) of air can hold only 8 ml ( $1/3^{\text{rd}}$ ) of water. So  $35 - 8 = 27$  ml ( $2/3^{\text{rd}}$ ) will be offloaded by  $1\text{ m}^3$  air.

# Quantification contd..

- One cotton cloth hanging of 3 x 3 feet (1 sq meter) evaporates 20 liters /day.
- 10 sq km water vapor farm will hold  $10^8$  units of cloth hangings.
- $10^8$  (units) x 20 liters =  $20 \times 10^8$  Litres of water evaporated daily from sea from one water vapour farm.
- Of this approx.  $\frac{1}{3}$  is retained by air and  $\frac{2}{3}$  is offloaded.
- $\frac{20 \times 10^8 \times 2}{3} = 13.3 \times 10^8$  Litres per day  
Ideally precipitated as dew.

# Quantification continued

- Ideally  $20 \times 10^8$  liters/ day or 2000 MLD is put in to Sahara desert eco system from 10 sq km water vapour farm.
- For practical purpose even with 1 % efficiency  $20 \times 10^6$  Litres/day or 20 MLD of fresh water is poured in desert.
- But we can consider 10 ~15 % efficiency.

# SWOT analysis

## Strengths

- **Technologies like water vapour farms, dew collectors are simple. So very less experimentation is reqd.**

## Weakness

- **Though individual technologies are proven, all combined have not been tried yet . So outcomes are unknown. Simulation and concept proving experiments are required.**

# SWOT analysis

## Opportunities

- **Revival of all eco system. A holistic approach.**
- **It`s the only way to create *so large quantity of desalinated water* at such a lower cost in the desert.**

## Threats

- **Intergovernmental coordination is necessary.**
- **Though vapour farm is moving partial localized concentration of salt may affect marine life.**

## Who should fund it and why ?

- Thousands of hectares of land negligible of cost will be available for farming including bio-diesel. Big corporates should invest.
- Thousands of hectares of land available for creating forest. Companies looking for carbon credit should invest.
- NGOs, Corporate concerned about global warming should invest.

## Who should fund it and why ?

- Per capita income of locals will increase, creating wealth for all. **Beneficiary governments should fund it.**
- **Poverty and drought will be eliminated.**
- **Food and work to many will reduce terrorism, racial conflicts and migration. NGOs and international orgs. working for world peace should invest.**
- Availability of water will improve health of affected. **So WHO should fund it.**

# Environmental viability

## SIMPLE IDEAS & SOLUTIONS` s innovative method

- Carbon negative process.. NO fuel required.
- Anti-scalants are not involved in the process.
- Natural but enhanced evaporation process, so negligible effect on marine life.
- Holistic approach. Algae to Zebra everybody`s thirst is quenched.

## Traditional desalination methods

- Fuel is consumed at all stages from evaporation to distribution.
- Adds antiscalants in to sea.
- Pumping in Sea water affects marine life.
- Is human centric. Does not consider all life - non-life forms require water.

# Economic viability

## SIMPLE IDEAS & SOLUTIONS`s innovative method

- **Capital cost \$ 0.8 / Liter.**
- **Simple technology.**
- **No moving parts either in water vapour farm or dew collector.**

## Traditional desalination methods

- **Capital cost \$ 1.58 / Liter.**
- **Technology intensive methods.**
- **Machinery intensive plants.**

# Business Viability

- *There is no chance of failure as we are only multiplying nature's own technology at all levels from evaporation to condensation.*
- *Competitive Advantage:* This is innovative first of its kind complete eco friendly process. Applied for patent.
- *Market Size and Potential:* Scalable & replicable model can be made for most of subtropical deserts
- Millions of people in desert are in need of not pure water but just any water.

# Business Viability

- **Raw material Supply and sourcing. Main raw material is sea water which is free.**
- **Cotton cloth, structures, dew collectors are common and locally available materials. Thus sourcing them is easy.**
- **Hundreds of hectares of land available at negligible cost.**

# Business viability: Revenue Generation

- **From carbon credit.**
- **Localized water purification plant sales.**
- **Dew collectors sales.**
- **Beneficiary governments for providing water to communities.**

# Expenses requirement

		<b>All In USD</b>
	<b>First year</b>	<b>142,600,000</b>
	<b>Second year</b>	<b>9,000,000</b>
	<b>Third year</b>	<b>9,000,000</b>
	<b>Grand total expenses</b>	<b>160,600,000</b>

# Summary

- Friends join me to create world`s first ever innovative “water vapour farm” project.
- Let`s quench thirst of all from algae to Zebra and not only of humans.
- This is complete clean-tech project. Requires zero energy of any sort to complete the project.



**If we Replenish water, ecosystem will start Restoring and eventually all life will Revive.**

# About author & company

- **LLP company fully owned by Mrs. Sukhada Manish Patil & Mr. Manish Dattatray Patil ( myself).**
- **We simplify work, we simplify life.**
- **We innovate chemical / pharma processes, plants.**
- **Out of box thinking solutions consultancy.**
- **Product redesign.**
- **We are Leonardo Da Vinci of this 21<sup>st</sup> century. We create ideas. Transforming of hard work to simple work in smart way is our USP.**
- **[www.simple-ideas-solutions.com](http://www.simple-ideas-solutions.com) (M) 91-9322596283**
- **[ccare@simple-ideas-solutions.com](mailto:ccare@simple-ideas-solutions.com), [manishpatil1966@yahoo.com](mailto:manishpatil1966@yahoo.com)**
- **Address : 13, Mayur Society, Ram Maruti Road, Thane, Maharashtra, India.**
- **Pin code - 400602**
- **The patent has been applied for this Sahara to Amazon process.**



- **New aquifers, streams, wells, rivers will form. Present one will replenish. Life will start reviving.**



# Action plan

- To create computer simulation of the whole project then laboratory model of the project with all working systems.
- To decide how much quantity can be practically evaporated and condensed daily.
- To study projected impact on the desert land itself and the whole earth.

# Action plan

- **To identify new wetlands/aquifers, streams that will form.**
- **To identify projected increase in volume of present aquifers.**
- **To innovate systems for collection of dew/fog for remote areas which consume no energy.**

# Acknowledgements

- Wikipedia for all maps, diagrams and other information.

Richard Bartz, Munich aka Makro Freak for insect photo on the first page.

[http://en.wikipedia.org/wiki/File:Snipe\\_fly\\_Rhagio\\_scolopaceus\\_with\\_dew.jpg](http://en.wikipedia.org/wiki/File:Snipe_fly_Rhagio_scolopaceus_with_dew.jpg)

- <http://teacherweb.com/TX/roberteleehighschool/Biology/12C.pdf>
- <http://environment.nationalgeographic.com/environment/photos/freshwater/>
- ***International Organization For Dew Utilization, France.***
- ***Mr. Ajit Deshbandhu. And all members of Hariyali and Jidnyasa (NGO)Thane India***
- ***Mr. Sandeep Waslekar strategic foresight group India “water for peace “concept from book Eka dishecha shodh in Marathi language.***

# Total three year process for first phase completion

- Simulation, Laboratory trials and its interpretation shall require about three months.
- Concept proving field trial will require three months.
- Actual setting up of water vapour farm, dew collectors, will take three months.
- Three months kept as buffer for unpredicted events, outcomes.
- Total one year process for paper to execution.
- Second year devoted to analysis and corrective actions.
- Third year for finishing the process and planning for scaling up.

# Man power requirement

1	Project coordinator / in charge 1 no (myself)	1	
2	Atmospheric sciences expert two nos.	2	
3	Environmental ENGG. with simulation expertise.	2	
4	Laboratory equipment expert.	2	
5	Dew collection methodologies expert.	2	
6	Need based expert as per specific requirement.	2	
7	Field engineers for dew collectors.	10	
8	Field engineers for water vapour farm	6	
	<b>Total</b>	<b>27</b>	

# Other resources requirement

<b>1</b>	<b>Office space with meeting room.</b>	<b>1no . Location near coastal Sahara.</b>
<b>2</b>	<b>Electronic infrastructure like PCs, printers, Office furniture. scanners Etc.</b>	<b>Sufficient for staff of 15.</b>
<b>3</b>	<b>Laboratory space</b>	<b>1</b>
<b>4</b>	<b>Vehicles for commuting.</b>	<b>3</b>
<b>5</b>	<b>Boat, vessel for water vapour farm</b>	<b>2</b>

# Expenses requirement

<b>First year</b>		<b>All In USD</b>	
<b>1</b>	<b>Salary</b>	<b>21,00,000</b>	
<b>2</b>	<b>Office rent</b>	<b>20,000</b>	
<b>3</b>	<b>Office electronics</b>	<b>7,000</b>	
<b>4</b>	<b>Software Licenses</b>	<b>1,00,000</b>	
<b>5</b>	<b>Conveyance</b>	<b>1,00,000</b>	
<b>6</b>	<b>Laboratory experimentation</b>	<b>20,000</b>	
	<b>Total for feasibility checking</b>		<b>23,47,000</b>
<b>7</b>	<b>Water vapour farm</b>	<b>7,00,00,000</b>	
<b>8</b>	<b>Dew collectors</b>	<b>7,00,00,000</b>	
	<b>Total</b>	<b>~14,26,00,000</b>	

# Expenses requirement

Second year		
		All In USD
1	Salary	21,00,000
2	Office rent	20,000
3	Office electronics	7,000
4	Software Licenses	1,00,000
5	Conveyance	1,00,000
6	Laboratory experimentation	20,000
7	Maintenance of cloth structures 5% Of structure cost	35,00,000
8	Maintenance of dew collectors 5%	35,00,000
	<b>Total ~~</b>	<b>90,00,000</b>

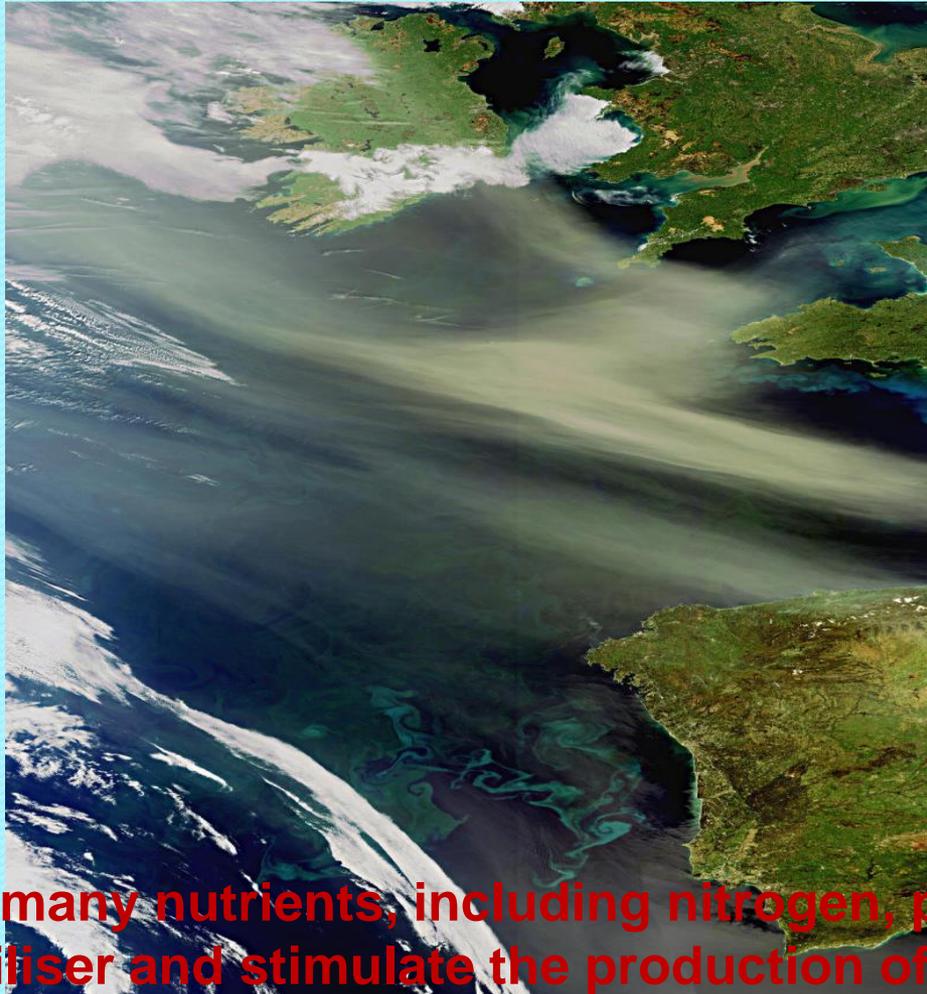
# Water vapour farm

- To erect vertical 3x3 feet cotton or similar cloth hangings with rigid floating supports in to the sea.
- While floating vertically, lower edge of cloth will just dip in sea water.
- Due to capillary action, sea water rises in the cloth wall to 3 feet.

# Water vapour farm

- **Reduced cohesive force between water molecules and increase in surface area of water.**
- **This will allow air to evaporate more water at the same temperature & wind condition.**

# Threats



**Satellite photo of sand storm Sahara across Atlantic ocean.**

**The dust contains many nutrients, including nitrogen, phosphorus and iron which act as a fertiliser and stimulate the production of massive plankton blooms in Atlantic ocean.**

**Sahara also provides on average more than 0.7 million tons of dust on each day that it is actively taking part in supplying nutrients to Amazon rainforest."**

# Personal motivation and Individual Qualities

- Myself wish to employ as project coordinator and CEO.
- I myself introduce as born Innovator, good in out of box thinking and self driven.
- The burning desire to use my these qualities for betterment of mankind has made me solve desert water crisis.
- For last 16 years field working for NGOs dedicated to environment.
- I have addressed about 450 industrial problems.

# What`s the only difference we shall be doing

- **Nature provides us desalinated water kilometers inside the coast in the form of rain.**
- **With water vapour farms “extra playground” is made available to the *nature*. Now it can *evaporate more water and distribute it with help of winds*.**
- **We are only multiplying evaporation and *dew making methods of nature*.**

# SWOT analysis

## Opportunities

- water of lower salt content from aquifers require 50% less energy than sea desalination.
- Best low cost way to reduce global warming.

## Threats

- None

# About SIMPLE IDEAS & SOLUTIONS

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- In night when temp will fall to about  $8^\circ\text{C}$ , 27 ml water will be offloaded in the form of dew by  $1\text{ m}^3$  air.
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- Of this approx 1/3 is retained by air and 2/3 is offloaded.
- $\frac{20 \times 10^8 \times 2}{3} = 13.3 \times 10^8$  Litres per day ideally precipitated as dew.

# Value proposition

- **Desert eco system has been feeding on dew for centuries.**
- **The idea is to increase water vapour in dry air above sea. This will increase dew precipitation in desert.**
- **The method intends to produce millions of gallons of fresh water without using single watt of energy.**

# What`s the only difference we shall be doing

- **Nature provides us desalinated water kilometers inside the coast in the form of rain.**
- **We are only multiplying evaporation and *dew making methods of nature.***

# Economic viability

## **SIMPLE IDEAS & SOLUTIONS`s innovative method**

- ***Smaller localized purification plants.***
- ***considering only human need and not irrigation etc.a re easy to build and operate.***

**Water of lower salt content from aquifers require 50% less energy than sea desalination.**

## **Traditional desalination methods**

- **Centralised purification is cash & fuel intensive.**
- **Does not consider that human requirement of potable water is only 20% of his total use.**