Water Security for Agriculture and Rural Development

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World Water Summit 2022 August 25

Philosophy of the Talk

- **WATER will determine the quality of life of both RURAL & URBAN citizens in future**

No Water Scarcity in India

(My conviction)

- **Strategy for Management of Water and Governance ability will decide the fate of future <u>GENERATIONS</u>.**

Surface Water → 690 BCM

Total water stored in 5.5 k dams	257 BCM
80% SWR for IRRIGATION	206 BCM
IRRIGATION η	50 %
LOSS	103 BCM

DOMESTIC WATER DEMAND

1.5 X .140 X 366 = 77 BCM

Rainfall is the principal source of :

WATER

2 Simple Points

Rainfall Deficit --- Irrigation

Rainfall Excess----- Drainage

On agricultural lands

Complex and Compound Inferences

RF Deficit --- Extreme - Drought

RF Excess --- Extreme - Flood / Deluge

Crisis of water

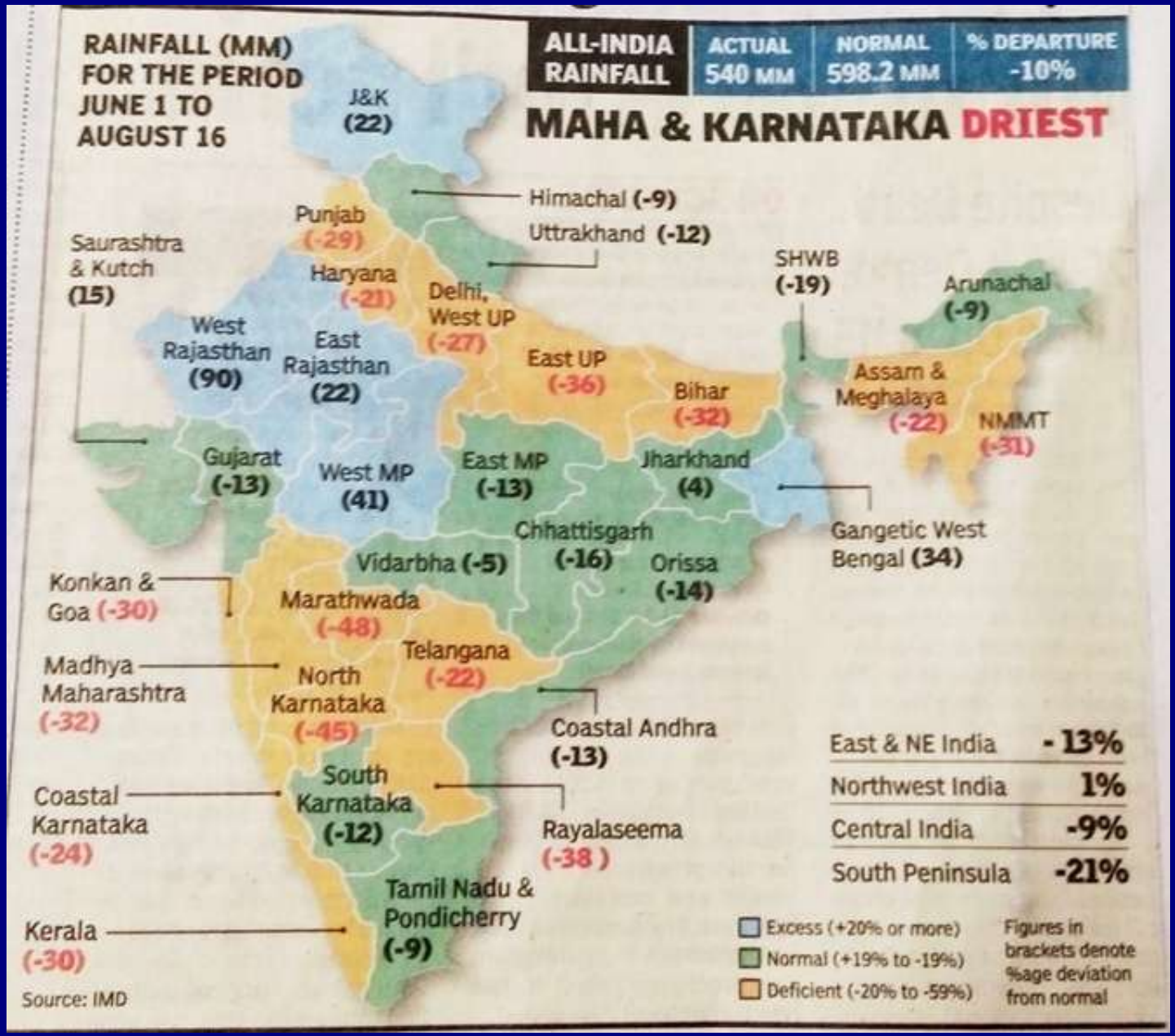
On the Ground Surface

Below the Ground Surface

UNDERSTANDING

- Behaviour of Rainfall
- Rain-fed Agriculture
- Climate Change

Rainfall trend in Any X,Y,,Z ,Year



RAIN-FED AGRICULTURE

Imagination and Assumption

Ministers /Advisors/Bureaucrats/ Scientists / Engineers / Activists and other Freelance Thinkers are assumed to be sons of farmers of rain-fed areas.

Conted....

Suppose……

They also do not get any monthly salary (say).

Conted...

BUT

possess all wisdom & are aware of the facts of rain-fed agriculture, known for the last 6 decades or more.

Empathic Thinking

In the backdrop of those assumptions & circumstances

Do they still recommend .....???
Practice of rain-fed Agriculture any more *OR* *Is status quo sustainable ??*

An honest answer will always be: NEGATIVE

Jal Shakti Abhiyaan

Big *Goals*

Har Khet Ko Jal

Har Ghar Ko Nal Se Jal

Important Reviews of the Past

- **National Water Grid by Dr. K L Rao, 1972**
- **Garland Canal by Capt. Dastur, 1977**
- **Inter-Linking of Rivers by Bajpai Govt., 2001**
- **Directive by Supreme Court of India, 2014**

The above mentioned ideas given by very influential leaders of the country could not be achieved till date.

VISION

Long term investment for long term gain as compared to short term measures.

INR 3.5 to 8.0 lakh crore investment

MANTRA

Think Big

Start Small

Act Fast

Can we make Indian Farmers independent of

- Monsoon &
- Climate Change

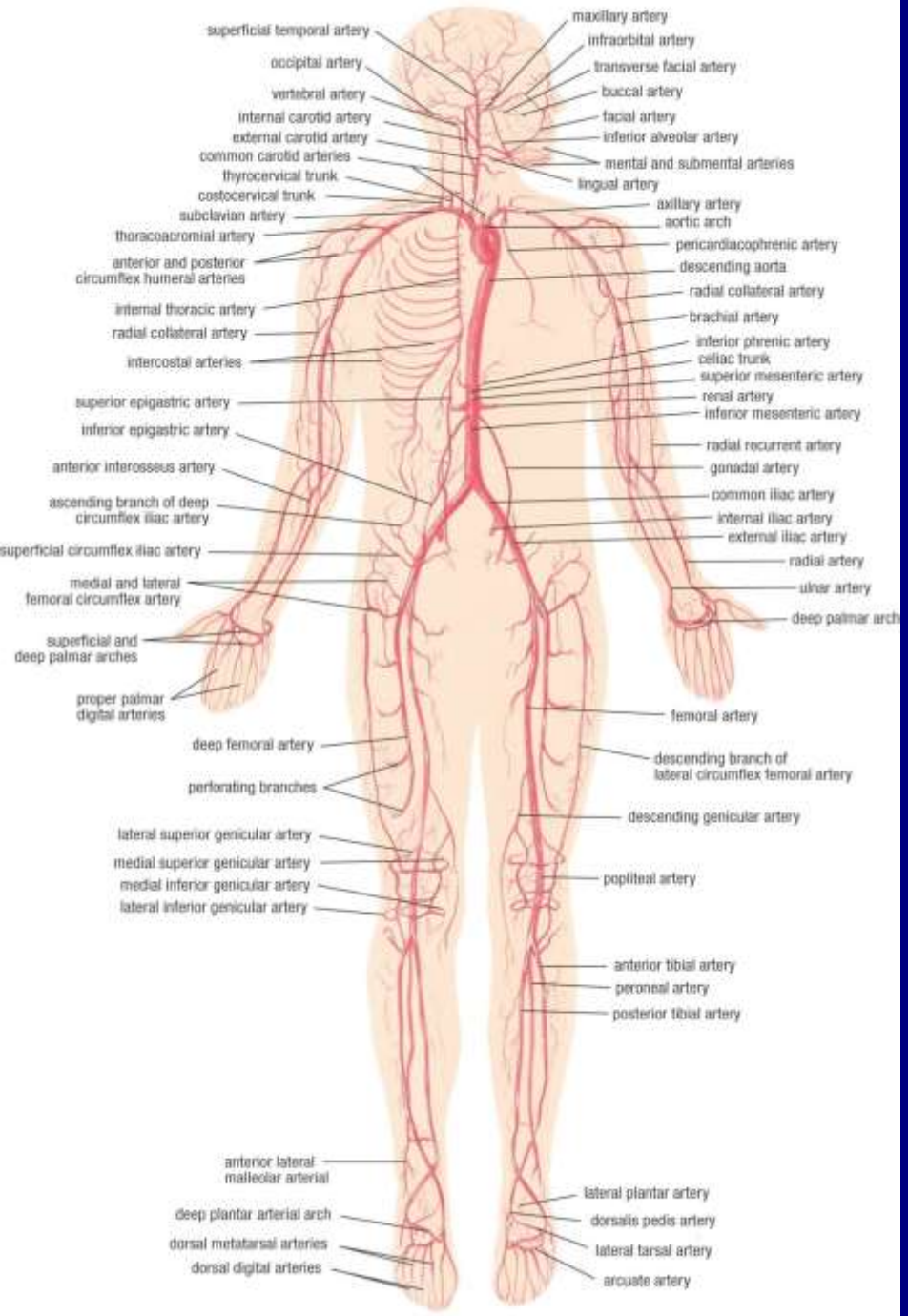
? ? ?

Prime Minister Narendra Modi used a Metaphor (2015) First in Public Meeting

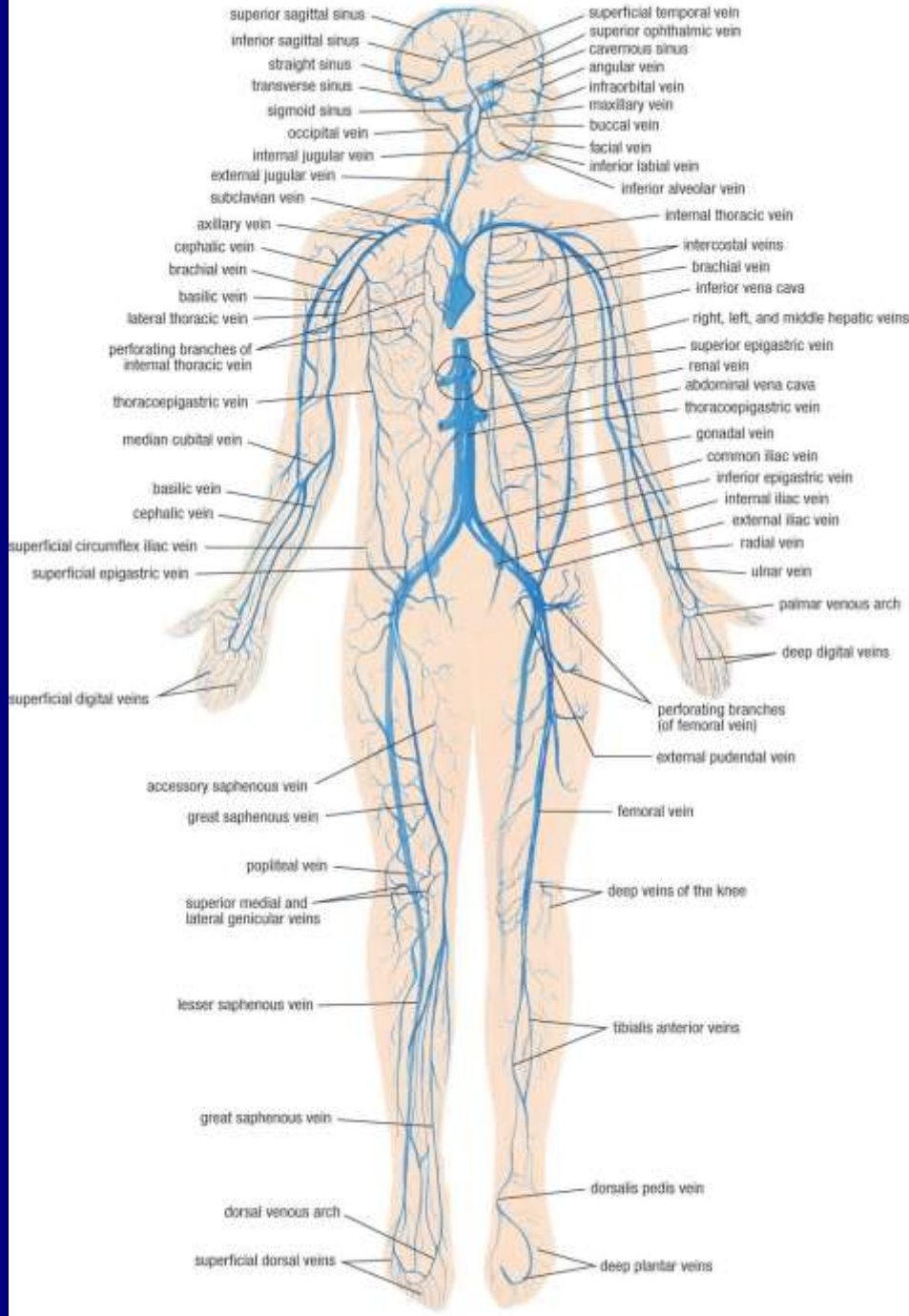
and repeated on May 26, 2017.

"Farm Land is Like Human Body".

ARTERIAL SYSTEM (ANTERIOR VIEW)

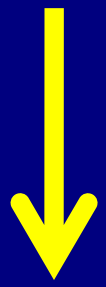


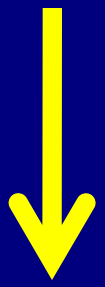
VENOUS SYSTEM (ANTERIOR VIEW)



A - V MODEL

ARTERY - VEIN

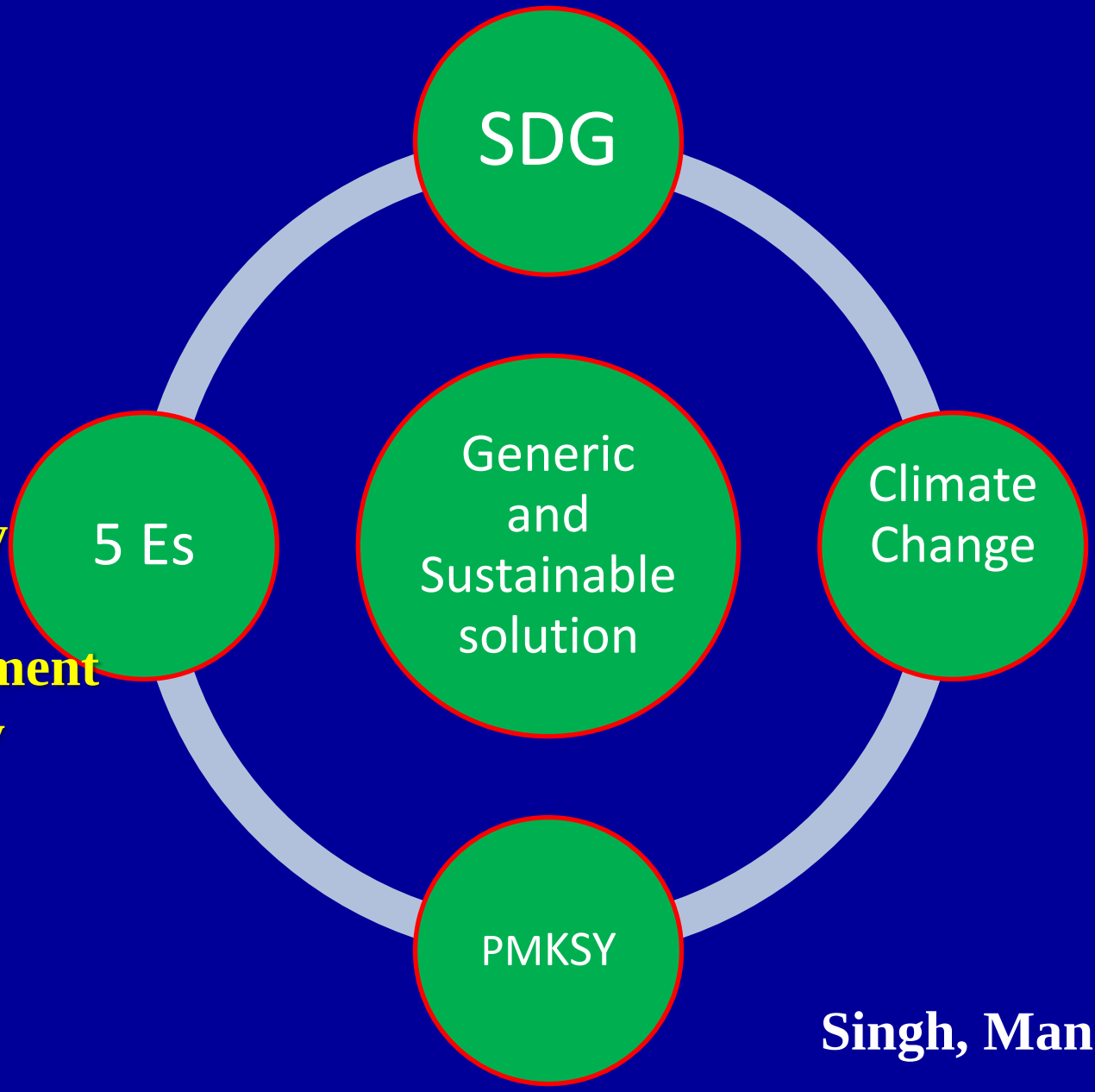




IRRIGATION - DRAINAGE

The human artery, vein, tissues and cells correspond to irrigation, drainage, villages and individual farms, respectively.

PARAGON - 30



- ✓Economy
- ✓Energy
- ✓Environment
- ✓Empathy
- ✓Equity

Singh, Man (2016)

Major Flaws- a reality

No where irrigation water is measured

No fair pricing of irrigation water

Can we expect higher .....

Irrigation W U Efficiency .... ?

Paradigm Shift is Inevitable

Define Water

Public Good  **Economic Good**

POLICY CHANGE

MEASURE & TREASURE IRRIGATION

WATER AND PAY FOR IT

~~*Muft Sichayi*~~

&

~~*Muft Bijali*~~

Natural Facts

- Even If, Irrigation water is of excellent quality, still brings some amount of soluble salts into the field that is irrigated for 20, 30, 40, 50 years.

- These salts need to be leached out to meet SDG and IIA.

GENERAL IRRIGATION PRACTICE

Uncontrolled usage of irrigation water[SW & GW] on one side and insufficient drainage or no sub-surface drainage on the other result in salt build-up in the root zone soil layer.

SOIL HEALTH PROBLEM

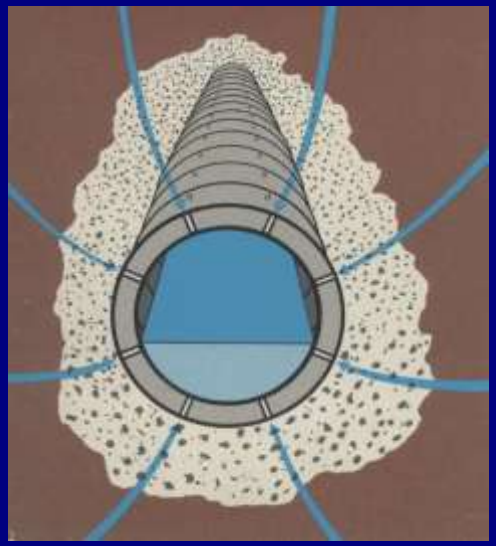
AND /OR

GROUNDWATER QUANTITY AND QUALITY PROBLEMS

comes up

The solution to this problem is only

SUB SURFACE DRAINAGE TECHNOLOGY



Standing observations of 5 decades

Salinity Build-up in the Agricultural Lands is a very slow process.

Therefore,

Farmers, Engineers, other Govt. Officials, Policy Makers and Political Leaders

See

Irrigation only as a need of today and

Salinity and water table control through Sub Surface Drainage, is a problem of tomorrow.

Professional K & W

Irrigation and drainage go together like head and tail of the same coin.

Or A – V of Human Body

Face of Irrigation is seen for past over 60 years.

Drainage is still waiting for its turn.

Transformation of Irrigation & Drainage Infrastructure

PROBLEM SOLVING APPROACH

We must CHANGE now and go for a paradigm shift

Proactive and Creative cooperation

Public –Private & Farmers' Partnership

Mechanized Subsurface drainage installation on the saline agricultural land

Subsurface drainage materials used in the Technology

Drain envelope

laying of complete lateral drain equipped with envelope material

SUBSURFACE DRAINAGE SYSTEM

Cost of Land Reclamation

INR 80 k to 200 k per ha

Cost of Land Acquisition

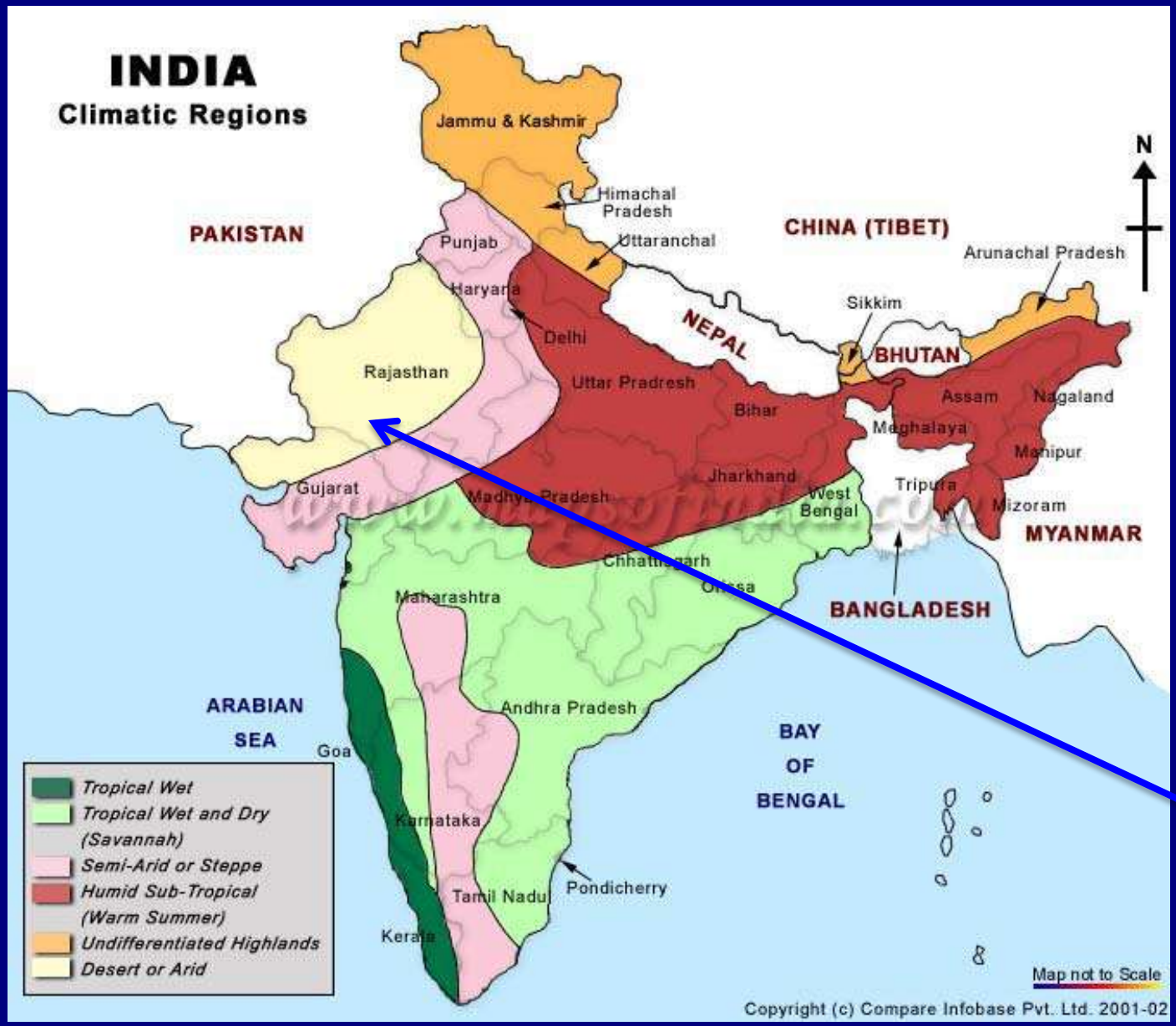
INR 2.5 crore per ha

INR 7500 crore

for 1 lakh ha

Transforming such lands into Cultivatable Land

Coastal Lands' Care



Maximum area that could be cultivated

142 - 160 m ha

Power of Drainage

CLIMATIC REGIONS OF INDIA AND CULTIVABLE AREA

Large Scale SUBSURFACE DRAINAGE technology application for land reclamation may

ease the smooth passage of pending land acquisition bill.

DRAINAGE  **SOIL HEALTH**

* **Land Improvement**
* **Adds More Cultivable lands for Production**

OUTCOME EXPECTED

Once the countrywide Networks of Irrigation and Drainage Infrastructure is in place by the strong Political Will

Farmers may become independent of monsoon rainfall and climate change.

Poor husbandmen can take diversified crops round the year. [Min 3, Max 4 crops per year] and earn money like any salaried person.

Some Quotes for Inspiration

- **When dealing with WATER, place Practice before Theory – *Leonardo da Vinci 400 yrs ago.***

- **Let us Collectively modify the Dictum in the context of Today**

- **When dealing with WATER, place Ancient Practices, Theory and Modern knowhow together to solve the WATER problems.**

Focus

“Farmer First and Water First”

F F W F

For Agriculture beyond 2024 in India

Soon India may have

Networks of Waterways Likewise

Roadways, Highways, Railways , Air ways and ……

Modern Knowhow

Acknowledgements

Chair Keynote Session

Mr. C S R Murthy &

Dr. Anil K. Garg

President, World Water Summit &

CEO, Energy and Environment

Foundation

And ALL the Participants

Thank You very much

for your kind attention