INDIAN NATIONAL WATER PIPELINE GRID= "INWPG"

(IMPORTANT POINTS & SUGGESTIONS)
BY
M/s Original Mechanization & Data Integrated Consultant
(M/s OMDIC)

REQUIREMENTS:

1) FRESHWATER BODY (IES), RAINFALL DATA & STATISTICS :
   (1) Normal (based on environment associated with water body(ies)
   (2) Low water (Shrink=Deficit)
   (3) High Water (Expand= Surplus)

   A. Rivers (Perennial/Seasonal/Dams)

   B. Lakes/reservoirs (Perennial/Seasonal/Dams)

   C. Existing Canals (Perennial/Seasonal/Dams)

   D. Ground Water

   E. De Salination Plants

   F. Others = (I) The Ship Shore Connected Portable Floating Pan collecting Rain water falling on the coastal sea/ocean surfaces, only when it is raining and seas are calm enough, and this water being piped onshore.
   (II) Identifying locations where Linking Sea/Ocean Water to Ground Water along coast lines and using water pressure induced membrane technology to charge Ground water with this membrane induced Fresh water at such locations; if any.

Listing of Sources of fresh water, and their contribution to all these Fresh Water Bodies, along with a grade of dependency from each contributing source. The more dependable a contributing source to a fresh water body, the more care will be taken to maintain/augment this contributing source.

3D real time imaging, with pre determined parameters of all freshwater bodies, and the available permutations and combinations of these water bodies, along with, computer simulation capabilities, to monitor and intelligently locate & drive the INWPG based on various and actual real time water scenarios will shape The INWPG.

Relevant types of water & pipelines:

Code Blue: Fresh water for edible/washing (human & animal) Purpose only
Code Green: Agricultural Water (Mixed with Fertilizers/Pesticides & Un mixed) Cater to increased yielding agros also as our current yields are shamefully low.
Code Yellow: Industrial Water and Water for Laundry
Code Red: Polluted/Dirty water from other color codes, fit for Recycling, to be treated & resupplied into blue, green & Yellow code types of water and pipelines.
Code Orange: Pre Flood Water management & control, connected to Strategic ground water & other reservoirs, so as to Dissipate & manage water in Real Time and avoid a Flood scenario from developing altogether.

Based upon the above types of water usage, we would have to determine how much water we should allocate on a per capita basis as well as usage type. These allocations should be generous enough, but the basis of allocation will always be efficient usage of the allocated waters. Once these numbers are determined, we will be able to calculate the water requirement aspects, and accordingly set up the required supply paradigms.

For Example: In North & North East of Madhya Pradesh (a state in India) are various river basins which regularly flood every year during the monsoons. Using a topography study to see the natural flows of Waters from these rivers, we could connect the overflows via Underground clusters of heavy duty Plastic pipelines, with each Pipeline leading into a web of pipelines for water supply to a

Plant (Industrial water), or to a rice or wheat plant in an agricultural field (agricultural Water), or to a Municipal Water Supply department of a village, town or city (edible & bathing water) or, the same water for laundry.
If this web of pipes reaches an over flow situation than waters can be Diverted into the underground ground water reservoirs from where it can be pumped out if required. For this, extensive ground water studies would also be required. Infact, we would have to do major computer modeling with different real parameters to be studied, and the pipe web would then have to be able to cater to all these studied water Scenarios.

Water can be brought into the Central India Ground water reservoirs, Via pipe all the way to Tamil Nadu. The off take of water from These NE India and Bangladesh areas will lessen the annual flood Impact in these areas and allow 2 or maybe 3 crops of extra grain to be cultivated and harvested. This would impact the pricing of Rice. I do not understand why Rice is grown in Punjab, Haryana & Western UP especially so in that it requires huge amount of irrigation resources. This water could be used to Green Rajasthan first and Rice can be considered later in Punjab, Haryana & Western UP. With the pricing being effected downwards as we get more rice crops in the NE regions of the sub continent, Punjab,Haryana & Western UP maybe de motivated to grow rice as prices would not warrant this. In any case, the eastern & north eastern areas in the Indian sub continent are more suited to growing rice. Furthermore, if 2 extra crops of rice can be grown in Bangladesh, the problem of Bangladeshi immigrants will be curbed, as these immigrants will firstly return to their lands (that will become attractively desirable due to a potential of 2 extra crops with no fear of their lands being flooded every year), and secondly, new illegal immigration into India (especially India & its NE regions where Bangladeshi illegal immigration is becoming a real issue of concern)will stop totally as Bangladeshis will be able to economically produce from their very own agricultural land areas within the borders of Bangladesh itself.

I have been told that it takes 1000 liters of water to grow One Kilogram of Wheat. I wonder how much water it would take to grow 1 kg of wheat using only drip irrigation.

A study to this effect should also be initiated by the relevant authorities. This study is very important when we realize that globally 70% of the water requirements are for agricultural purpose. It also then makes commercial sense to set up the recommended Pipeline Grids and their Pipe Webs as I am sure that using drip irrigation would be far more efficient in water usage.
A one time investment in setting up drip irrigation systems would be the order of the day and a sound capital investment decision.
Even "nallahs" within a small farm should be converted into pipeline(s).

Agricultures as is, is not commercially viable especially if one assigns a cost to water that is required to grow a crop. Savings generated by lower water usage will reduce the subsidies on agriculture substantially.

How much fresh water flows into seas and then becomes saline seawater will also have to be looked at, and an allowable flow subject to relevant environmental issues will have to be ascertained and executed.

One would have to identify the Micro Entity and its identification criteria, (for example: A Village or a Population of 10,000 people or a measured land area etc) the sums of which would cover the entire country. Work will start by servicing & addressing each Micro Entity with its water requirements, and will end, when all Micro Entities have been serviced and addressed. Existing water infrastructure will be assessed, upgraded, absorbed and "Ruffooed" into the INPWG in a seamless manner where there would be no distinctive difference between the old infrastructure and the new INPWG.

As such, various types of water requirements will be quantified, and projected, and the Water Grid will be designed & mandated to deliver these quantities across time. The Water Grid will be designed to be executed, as the water requirements are determined.

Pigging & Filter facilities for different pipeline color codes to maintain continuous flows of waters, and water color code quality parameters to be pre determined and measured/maintained by manner of relevant water treatment capacities. Pre pipeline/web entry water issues, systems & treatment, along with post exit water issues, systems & treatment will have to be resolved. Pumping and treatment to be preferably primarily powered by solar energy, but location

based most convenient/efficient backup power to be installed also; including micro hydro electric power stations; all with a long time vision to be future ready, in the planning of the entire INWPG.

Manual armed security & maintenance across the INWPG will create sustainable & regular employment all across the Water Grid. In fact, I would go to the extent of making a Water Officer as part of every Village Panchayat in each Water Micro Entity.
The entire operation would have to be managed by conjuring up a BENEPOLY which would be an "Allowed Monopoly", which will have an ideal mix of private, public, joint & government sectors pluses, to efficiently & optimally delivering the service & product of water, to the population of the sum of micro entities, that will be the exclusive market, for water, of this BENEPOLY. Water being A VERY IMPORTANT product/commodity; this Benepoly would be required & formed for the sole purpose to devise, co-ordinate, absorb, implement, execute, manage, control and deliver water, not necessarily with pure commercial purpose…….Break-even could be a commercial goal….though water was a natural free resource, and should remain so. Just as planting trees is funded by government bodies, maybe providing capital & adequate monies for setting up a drip irrigation pipeline and its pipe webs could be provided also as well as monies and resources to maintain these pipe systems.

PIPELINE ISSUES:

1) Material Type (s)
2) Over ground
3) Under ground
4) Suspended
5) Level
6) Gradient (Downhill or Uphill)
7) Pipe Sizes (both diameter & lengths)
8) Pipe Size (s) & required water flow(s) Integration nodes/systems
9) Pipe hierarchy (Macro all the way to micro : Carrier pipes & distribution pipes & delivery pipes/taps/drips : Inter State/City/Town/Village/Micro entity)
10) Pipe Quality parameters 5
11) Specific criteria to be established for laying the course & Capacity of a pipeline.
12) Pumps & Pumping Technologies including powering pumps Technologies
13) Filters & Filtering Technologies

The pipe diameters need not be more than 2-3 feet. This lack in pipe diameter can be made up by laying clusters of such pipe which in pure numbers can be 100s, or even 1000s in each cluster(s).

This is a note on existing canals & nalas:

Existing canals can be filled up with these 2-3 feet diameter pipe clusters delivering water as before but more efficiently and at the same time the land surface of these clusters can be filled up and even farmed upon.

Existing nalas could be done with in the same manner or, alternatively, instead of a Nala, a pipeline cluster could be erected to connect the original Nala with the ground water in the path of the Nala, and if with the newly formed surface duly recovered, then this could be made available to farm on also.

DO NOTE, THAT I RECOMMEND FOCUSING ON CRUDE PETROLEUM BASED PLASTIC/PVC/POLYMER PIPELINES & WEBS.THIS IS BECAUSE, IF THE INDUSTRY MOVES TO ZERO EMISSIONS USES, CRUDE PETROLEUM CAPACITIES CAN BE UTILISED TO MAKE THESE PLASTICS/PVC/POLYMERS PIPE WEB REQUIREMENTS. THIS WILL ACT AS A CATALYST TO MOVE CRUDE PETROLEUM CAPACITIES AWAY FROM EMMISSIONS USAGES AND, TOWARDS ZERO EMMISSION USAGES.IT IS TO BE NOTED, THAT MOST OF THESE PIPE WEBS CAN ACTUALLY BE MADE & EXECUTED IN COUNTRIES AND AREAS WHERE MOST OF CRUDE PETROLEUM IS PRODUCED & WHERE NATURAL SHORTAGES OF WATER CURRENTLY EXIST.!! 6

A SLIGHT BUT RELEVANT DIGRESSION:-

USING THESE HEAVY DUTY PLASTICS WE WILL BE ABLE TO MAKE A 4 STOREY HIGH FARM, FOR EXAMPLE: ON A 1 ACRE PLOT, 4 STOREYS ON THIS PLOT WILL MAKE AVAILABLE 5 ACRES TO FARM ON. AND IT GOES WITHOUT SAYING THAT THE POTENTIAL OF SIMILAR PLASTICS IN MAKING GREEN HOUSES OUT OF THESE MULTI STOREY FARMS, OR GREEN HOUSES ON OTHER NORMAL GROUND LEVEL FARMS, IS YET TO BE REALISED.

ANOTHER USE IN PAPER REQUIREMENTS CAN ALSO BE MET BY PLASTIC PAPER.

INWPG will be a bi directional pipeline with portable emergency failsafe/bypass capabilities. Using the data, statistics, 3D Imagery and Computer simulation scenarios, the pipeline will be laid into an all weather/climate/natural calamity proof water grid all across the country. The Water Grid will also interface with the seasonal requirements of real time farming activities, and will deliver water on demand, as per the seasonal requirements. As such, Sowing, Growing & type(s) of cropping information will be made timely available as the water grid situation develops during a season. Crop type may be made mandatory, as actual water availability may dictate this.

One could also look at diverting snow melt waters of the Tibetean & Siberian Plateaus (melting during winter if required could be by burning gas) under the Himalayas or via the Ladakh/Leh route into the ground water basins of North India, especially Punjab,Harayana & Rajasthan. This would save a lot of flooding in China and at the same time provide us with water for agriculture. I would not be surprised if this were the actual source of the lost river called Saraswati which perhaps emptied out in a sea/ocean between the plains of now India and then flat Himalayas and dried up when these two land pieces joined up and lifted into the current Himalaya mountains.

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Ground Water Linking could also be looked into. If surplus waters result after catering for the grid requirements, then these surplus waters will be stored in strategic & relevant underground water reservoirs, as opposed to be stored in over ground storage modes. The natural efficiencies of underground storage (no evaporation) would outweigh the recovery costs (bringing the water back up from the underground reservoir) of this water especially if they are powered by solar pumps.

Land & habitats closest to the subject water body(ies) to be provided water first, for all types of usage, and only surplus waters to be injected into the grid. The pipeline will also be defined as a water body for this purpose and have the necessary capacity to provide adequate waters all along its planned & executed course. Water harvesting to be made compulsory all across the areas that the INWPG will serve, with a priority to CHARGE Ground water by RAIN WATER harvesting being mandatory by legal statute.

An EIS study on effects on Soil erosion due to Rain Water Harvesting being connected directly to Ground Water (This connection should be made compulsory), and any fallouts due to the INWPG, will also be have to be factored in. This direct connection between Rain & Ground Water could counter the climate change effect of rising seas & oceans , and this calculation must be also part of the scope of the proposed EIS.

(8)

The 2 rules of this Pipeline will be that it will supply all types of waters that are required on its route in exchange for permission to move the Pipeline either over, on, or under the land that it winds through.

It is to be noted that there has never been a shortage of Fresh Water Supply, (by Snow Melt or Monsoon or Rain) but there has been a critical lack of management of such waters. We have to address this management of fresh water, in an absolutely
Efficient & optimal manner. The INWPG will be made to last and its capital & variable expenditure requirements to execute this will see to that. SHORTAGE OF CAPITAL, OR MONIES, WILL NOT BE A CONSTRAINT, OR AN EXCUSE IN NOT FORMING THIS BENEPOLY, TO EXECUTE & IMPLEMENT THE INWPG !!??

This water pipeline grid as described & recommended, is universally applicable in other countries also, and can be customized to suit a particular water management scenario.

An off shoot project of the INWPG is the BRO with FW project:

BRO with FW stands for Ballast Replacement Operation with Fresh Water.

Most Tanker Shipping Capacities are sailing out of West Asian-Middle East- Saudi Arabian areas, carrying liquid crude petroleum, or their by products, to almost all corners of the world. These West Asian-Middle East- Saudi Arabian areas face natural shortages of water, be it for human consumption, for agricultural usage, or for industrial usage.

After delivering their cargoes, these Tanker Capacities take on Ballast, which is mainly Sea Water (unfit for any usage except Ballast due to high salinity) & then head back to their original load port for another similar liquid Cargo and its subsequent journey. By substituting these Sea Water Ballasts with Fresh Water Ballasts as a return cargo, an immense global commercial opportunity within the Shipping Industry becomes apparent.

These FW return cargoes could utilize the tankers return journey's unused capacities (which are Dead freight), and can harvest FW from the mouth of rivers, subject to environmental issues; FW: which would have in any case flowed into the seas, and become saline sea water. Not only does the tanker vessel earn freight for the return cargo, but it can also sell the FW return cargo to the government, or municipal authorities in these areas for even agricultural use.
Overage vessels, be they tankers or bulk carriers, which would be heading for the scrap heap, can be stripped down, re fitted and re certified to carry only Fresh Water. Even if it requires these vessels to be stringed together, and powered by tug boats.
Loading, unloading and storage facilities and capacities, similar to what is in place to handle crude petroleum and their by products, have to be made and put in place to handle Fresh Water.

Water Treatment plants could also be factored into the required infrastructure.

Water could be pumped into a balloon which will fit the vessel contours. This loading of FW could be done simultaneously while the vessel is unloading its petroleum product(s). Alternatively, a temporary Slide in Hull is slipped on and over the dirty bottom of the vessel's tanks, fitting it's contours. This will ensure that the water is kept clean and the turnaround will be efficient in terms of time also. However, the engineering required to make a vessel BRO with FW compliant, with a kit to do so on existing vessels, and to factor in for vessels which are under construction, or will be: the Ship
builders & engineers have to decide & take the call and discuss whether these marine/ship engineering requirements can be catered to in a viable commercial manner.

Just to get an idea of the potential numbers, the following is a brief Financial periscope view of the numbers involved:-

(INR One Crore is INR 10 Millions is USD 200,000 with USD 1 = INR 50)

A vessel carrying 250,000 Mt of crude petroleum oil from UAE/Saudi Arabia unloads at Kandla (Port in Gujarat, India) and takes on approximately 250,000 MT of Fresh water, (which is approximately 250 million liters of water) as its return cargo cum ballast. Even at INR 1 per liter, that works out to approximately Gross INR 25 crores. (USD 5 millions) potential values of the FW return cargo per journey.
My unconfirmed sources have indicated that The Saudi Arabian government provides free water supply to its citizens. This water costs them in the region of INR 4-6 per liter. Huge de salination plants provide this water. With 50 million MT of crude and product coming into India per annum, this works out to a max potential of approximately INR 5000 crores (USD 1 Billions) not withstanding the fact that the inward (50 Mln MTs per annum) tonnage will only increase in the future.

On top of this, there are potentially 6 more nodes for BRO with FW, with the River Yangtze Node being potentially the biggest: as per this calculation, this would amount to all the tonnage coming to Korea, China, Taiwan & Japan returning with a return FW cargo cum ballast,

which @ INR 1 per liter, would work out to approximately INR 20-25000 crores. Global gross revenue potential would approximate to at

least INR 50,000 crores per annum, (USD 10 Billions) and this number will only increase as consumption of crude petroleum & its by products increases.

Do also note that we are using only INR 1 (approx. 2.5 USD cents) per liter in our calculations, and we are utilizing part of the water that in anyway would flow into the sea, that too, just before it does flow into the sea.

Global Potential Disport//Nodes which could undertake the BRO with FW proposal.

a) In India (River(s) & Place(s) to be determined after relevant analysis).The Narmada River to begin with (In Gujarat, India), or The Indus River Mouth in Pakistan.

b) Yangtze River mouth at Shanghai servicing Japan/China/Korea/Taiwan return journeys.

c) Mississippi River-New Orleans- serving south and Eastern USA.

d) West Coast USA (to be determined)

e) River Rhine-Hamburg-servicing Netherlands/Germany.

This is just an indicative list and there maybe more locations which could be found viable to embrace BRO with FW.

Also note that when ships touch Indian ports and purchase Fresh water for internal usage
The purchase charge for FW can vary from INR 300 upwards per MT. (1000 liters)

They are charged on the function of distance from source of water to the vessel, and quality as in TDS (total dissolved solids): 1000 mg

TDS per liter is unfit for human consumption, and 75-110 mg TDS per liter is your Bottled Mineral water which you pay upwards of INR 12 per liter bottle.

Furthermore, we can link up by underwater pipelines in international waters, the freshwater available subject to environment issues, that flows into the Arabian Sea from the mouths of the river Indus (in Pakistan) & the river Narmada (on India west coast), and other rivers that flow into the Arabian sea from Iran also.

The monies earned by BRO with FW can be utilized to partly finance the INWPG.
Of course, if one wants to Start Up immediately, we can make vessels do The River Euphrates & UAE journey with a one way cargo of FW on a 30 year old tanker/bulk carrier which has been duly certified and refitted, and subject to relevant receipt infrastructure being in place. This water can then be fed into vast pipe webs of drip irrigation, which would be used to actually farm agros in the UAE wastelands or other West Asian regions that naturally lack water.

Cost/Duration of this DPR : ?? As per possible budgetary sanctions. Duration to be decided after assessing the monies sanctioned and accrued for this DPR.

I, as a SME/SBU trying to work this (BRO with FW) project in the PPP space, in my style of M/s OMDIC: A macro level consultant, only for mutually acceptable compensation.

R/o B 3/70 Safdarjung Enclave (SJE), New Delhi 110029 INDIA.
Cell No: +91 9811188887.Email: vidur.vidurraj@gmail.com &/or vidur@omdic.com