

Eco Friendly Competent Ware -“VIZAG STEEL”



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ABSTRACT:

The iron and steel industry causes significant effects on environmental media- air, water and soil. The polluting emissions in the iron and steel industry are controlled by a variety of evacuation systems, devices and methods such as cyclone cleaners, dry or wet electrostatic precipitators, scrubbers, bag houses etc. One of the major challenges for industry is to aim for high environmental and working environment conditions. Polluting emissions can be very much controlled by controlling devices and methods within the departments or sections but environment control measures outside the company is very important for healthy and happy living exposure by reducing adverse climatic conditions.

This is a conceptual case study extended by the authors to find out the determinants enforced to create a safe and healthy environment for the inhabitants of the VIZAG STEEL PLANT and surrounding neighborhood. All the concerns addressed in the article make everyone to introspect on the situation and this led to the incubation of the concept on Green Productivity for sustainable development.

Key Words: Environment, Agro forestry, Plantation, Arogya vanam, Nursery, Vermicompost.

1. INTRODUCTION:

“We don't want to protect the Environment.....,

We want to create a world where the Environment doesn't need protecting”

Visakhapatnam Steel plant is a public sector steel plant owned by Rashtriya Ispat Nigam Limited (RINL) - the corporate entity of Navaratna Public Sector Enterprise (PSE) under the Ministry of Steel. Visakhapatnam Steel Plant – popularly known as VIZAG STEEL and is the first shore based Integrated Steel Plant in the country and is known for its Quality Products and Customer Delight. RINL is a market leader in long Steel products and caters to the requirements of the Construction, Manufacturing Automobile, General Engineering and Fabrication Sectors.

RINL-VSP is the first integrated Steel Plant to be certified for ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007 standards. It is also the first PSE to be certified for ISO 50001 - Energy Management Systems and CMMI Level 3 Certification for Software Development. RINL-VSP is also certified for ISO 27001- Information Security Management Systems (ISMS) in Information Technology- Enterprise Resource Planning (ERP) services in VSP.

Under expansion of 3.0 MT of liquid steel to 6.3 MT of Liquid Steel, a number of new features aimed at improvement in the areas of Air Pollution, Water Systems, Energy efficiency and Waste Management were incorporated. Further, RINL had commissioned 5 MW capacity Solar power which will provide an alternative renewable energy source to the company and also help in achievement of commitments towards green initiatives and clean energy.

2. EVOLUTION:

Environmental Management System ISO 14001 has been implemented throughout the plant covering 47 departments.* Extensive environmental facilities were planned and implemented while setting up the plant and also during its expansion and

modernization. A wide array of pollution control equipment to contain dust emissions and for treatment of waste water and effluents were provided in the plant and further improved through modernization.

RINL has introduced new technologies for reduction of greenhouse gas emissions and made huge investments on environmental protection systems in expansion also. RINL has developed a software tool "Envision" in-house for posting real time data from online systems to the process owners at control points to facilitate timely corrective actions.

ENVISION (Environment Status and Information Online) is integrated with SCADA and QUEST in generating the data relating to TPP Gas Flows. ENVISION collects the data at regular intervals from 4 Ambient Air Quality Monitoring stations and 15 Stack Emission Quality Monitoring stations. It has the provision for data logging of Hazardous wastes, Solid wastes, Water Consumption, ESP Field status, DE Systems, Fugitive emissions, Effluent Quality monitoring details of major departments in VSP. It generates trends for critical parameters and exceptional reports when parameters are not in acceptable range.

In addition to the above, a large-scale of afforestation has been done by Agro Forestry Department of RINL to create healthy environment in and around VSP. More than 53 lakh trees have been planted in an area of 2720 Ha so far and also aiming ahead towards plantation of 73 lakhs in Toto.

3. AGRO FORESTRY PROGRAM IN RINL, VSP:

Agro forestry plays a crucial role in containing industrial pollution as the plants absorb significant quantities of pollutants from air, apart from restoring oxygen balance and acting as noise, wind and dust barriers. The construction of a gigantic Steel plant with the resultant transformation of the ecology had made a parallel drive for extensive tree plantation program all the more necessary. The construction of a Steel plant, clearing the area for construction of roads and setting up a Township had considerably changed the existing environment and posed a challenge for VSP to prevent deterioration of site due to soil erosion, exposure and adverse climatic conditions.

A comprehensive Afforestation plan was prepared and launched in 1986 to afforest entire VSP to create a safe and healthy environment for the inhabitants of the township and surrounding areas. VSP has adopted "CONSERVATION OF ENVIRONMENT" as one of the main objectives and various plantation modules such as Block plantation, Avenue plantation, Green belt, Wind break and shelter belts have been adapted to suite different soil conditions and local environment. As a result of massive afforestation drive, RINL- VSP has become a microclimatic zone by itself and of late there is a perceptible change in temperature with ambient air quality in spite of the proximity to the plant.

3.1 GOALS & OBJECTIVES

- To plant one tree for one ton production of steel i.e 7.3 million trees.
- To give more emphasis to reduce industrial pollution
- Eco system based approach to achieve sustainable Environment.
- Apart from environmental protection revenue based plantation.
- Create Environmental awareness among the people

3.2 AROGYA VANAM/ MEDICINAL PARK :

"Health is Wealth"- Traditional medicine provides health care for more than half the world's population with 80% of people in developing countries relying on these practices. Imminent changes in the environment also pose a threat to the traditional knowledge. Due to ongoing environmental changes, we are continuously losing rare medicinal plant species every day which may lead to the change in the ecosystems and affect what plants people can use around them.

Agro forestry department has started the "Arogya Vanam" cum Meditation Park in 5 Acres areas by planting various rare and high value Medicinal Plants to conserve and pass down this typical traditional knowledge to new generation.

The design of the layout is such that it resembles human body in each part of the body. Air releases by the medicinal plants is very much beneficial in curing the Pre-radicals which are the main cause for degenerative disease like cancer etc., and developing medicinal park will act as an alternative health project. This is beneficial to all the employees, their family members and also for the people who are living nearby. Figure-1 indicates the design of ‘Arogya Vanam’ which is correlated with Human Body at Figure-1 and Table-1 gives the details of medicinal plants developed and its uses.

Figure-1: Design of Arogya Vanam



1. Datura stramonium
2. Artemisia vulgaris
3. Bauhinia variegata
4. Bryophyllum pinnatum
5. Gymnema sylvestre
6. Abrus precatorius
7. Bacopa monnieri
8. Catharanthus roseus
9. Cissus quadrangularis
10. Vitex negundo
11. Terminalia bellerica
12. Aegle marmelos
13. Alpinia galanga
14. Ocimum tenuiflorum
15. Nerium oleander, 16. Aloe vera etc.,

Table:1

Important Medicinal Plants developed and its uses:

S.no		Name of the plant	Usages
	A	Hair	
1		1 Kesaraj	Leaf to be boiled in coconut oil till it turns in to black color and filter the leaves and apply to hair
2		2 Guruvinda	Leaf to be boiled in coconut oil till it turns in to black colour and filter the leaves and apply to hair
3		3 Shikakai	Fruit powder used as shampoo for dandruff control

4		4 Parijatam	Seed powder can be applied as shampoo for dandruff control
	B	Skin	
5		1 Ranapala	Leaf to be heated and apply on skin boils
6		2 Bavanchalu	Seed paste applied on psoriasis
7		3 Nalla Jilledu	Milk can be can apply on Eczema
8		4 Dancing Cacti (Kada Jemudu)	Stalk can be applied over skin diseases
	C	Brain	
9		1 Bhrami	Leaf powder can be used as brain tonic
10		2 Saraswati	Leaf powder can be used as brain tonic
	D	ENT	
11		1 Sweet basil (Sabja)	Leaf juice used for Ear ache
12		2 Pipparement	Leaf juice used for mouth & Nose
13		3 Akkalakarra	Fruit is used for Tooth ache
	E	Respiration	
13		1 Meka meyani Aaku	2 to 3 leaves to be swallowed before break fast, will controll Asthma
14		2 Vakudu	Fruits can be used curry
	F	Heart	
15		1 Choleous	Tuber can be used as herbal tea
16		2 Tanikaya	Fruit powder can be useful in heart problem
17		3 Samudrapala	Leaf tea useful in hart problems
	G	Liver	
18		1 Nelavemu	Leaves powder useful in liver problems
19		2 Kamanchi	Leaf can be used as curry
	H	Stomach	
20		1 Vamu Aku	Leaf can used in Stomach ache
21		2 Mint	Leaf tea useful digestion
22		3 Pepper	Fruit powder useful digestion

23		4 Aloe vera	Leaf juice useful in digestion
	I	Urino Genital	
24		1 Atti Patti (Lajjalu)	Leaf tea useful Urino genital problems
25		2 Erra Bachali	Leaf useful for constipation
	J	Cosmetic	
26		1 Aloe vera	Leaf juice useful as face cream
	K	Health	
27		1 Tulasi	Leaf tea useful in improve immunity
28		2 Multivitamine plant	Leaf contins all vitamins except D vitamin
29		3 Stevia	Leaf contins natural sweetener
30		4 Aswagandha	Root useful for General health
	L	Common & Specific Plants	
31		1 Vavili	Leaf used for pains
32		2 Nalleru	Stalk can be useful in Osteo porosis
33		3 Parijatam	Leaf usefull in Saitica
34		4 Badida	Bark can be usefull in Frozen shoulder
35		5 Putranjeeva	Bark and Furit can be usefull in Elephantiasis
36		6 Gangaravi	leaf decotion usefull as anti septic lotion
37		7 Ponna	Seed can be usefull in tighten the teeth
38		8 Maradu	Leaf powder usefull in daibetis
39		9 Arjuna	Bark tea can be usefull heart problems
40		10 Medi	Fruit and root juice can be usefull in ladies problems
41		11 Lakshmana tree	Fruit and leaves useful in cancer
42		12 Addasaram	Leaf can be useful in cough
43		13 Nalla Umetta	Leaf oil can be used in joint pains
44		14 Uttareni	Leaf juice can useful in Insect bite

and many more medicinal plants of more than 90 are being developed to create awareness to one and all of using & visiting “Arogya Vanam” .

3.3 NURSERY

Departmental nursery has spread in area of 6 acres with the goal to raise 75,000 to 1 Lakh seedlings per year for sustainable supply of saplings for plantation. Nursery having well defined infrastructure of greenhouse to propagate cutting material and lath house for hardening of cuttings and seedlings. Other than infrastructure well planned irrigation channel to provide better watering facility is available at nursery. Currently departmental nursery is raising many more different forest species of pollution resistant and indigenous species. The following are a few of many developed at Nursery.



- | | |
|-----------------------|---------------|
| 1. Gulmohar | 11.Mango |
| 2. Peltophorum | 12.Pongamia |
| 3. Cassia Siamia | 13.Parijatha |
| 4. Teak | 14.Maredu |
| 5. Conocarpus. | 15. Kadamba |
| 6. Neem | 16.Arjuna |
| 7. Java Plum | 17.Sandal |
| 8. Bauhanian Purpurea | 18.Guava |
| 9. Mahagani | 19.Cashew |
| 10. Moduga | 20.Eucalyptus |

Alike more than 40 variety of different saplings are being developed at RINL, VSP Nursery.

3.4 VERMICOMPOST UNIT

Proper nutrition is important for satisfactory growth of saplings or crop growth and production. Excessive use of chemical fertilizers and other agro chemicals, which are the important inputs in modern farming, creates depletion in soil fertility and pollution in surface water bodies.

Therefore, to avoid excess use of chemical fertilizers and their bad impact on soil, water, air and human health, organic fertilizer is only the way to sustain eco-friendly environment. From Nile valley civilization to Sindhu valley civilization success, earthworm has played an important role due to its unique feeding habit on waste organic material and converting into a nutrient rich compost and soil conditioner.

Keeping the view of eco-friendly nature of vermin compost, Agro Forestry department has constructed three vermin compost units at Coconut grove area, Old Nursery and Siva temple plantation area and also developing more than 20 tons of vermicompost per annum.

The model of vermin compost unit is shown below:



Advantages

- Enriching soil (5-10% richer in K, P, N)
- Improve water holding capacity and soil pore space
- Enhance microbial activity in soil
- Increase plant growth and yield.
- Suppress plant disease

3.5 GREEN VISAKHA PLANTATION PROGRAMME:

In addition to the plantation in and around VSP, Parliamentary Standing Committee on Science and Technology, Environment and Forest during their visit to Visakhapatnam advised to PSUs and other industries in Visakhapatnam to take up massive plantation drive under Green Visakha Programme. The total target for Visakhapatnam as a whole was 40 lakhs trees to be planted in Green Visakha Municipal Corporation (GVMC) areas.

The target given to RINL, VSP plantation under Green Visakha Plantation Programme is 4.5 Lakhs saplings and RINL has completed plantation of 3,50,400 saplings so far and further plantation is under progress to complete the target at the earliest.

4. CONCLUSION:

Eco-friendly literally means earth-friendly or not harmful to the environment. This term most commonly refers to the products that contribute to green living or practices that help conserve resources like air, water and energy. Though RINL, VSP is dependent on external sourcing for key raw materials and hence focuses on improving productivity and energy efficiency to minimize the cost disadvantage of raw materials to sustain healthy bottom line. The focus has always been on minimizing the operating costs by recovering and reusing waste energy and waste heat in the plant and creating happy, healthy and eco friendly life to all the stakeholders.

Finally, on the community development front, RINL- VSP is strongly believe that for sustainable economic development of the country, every individual is responsible and needs to create a sustainable livelihood besides the industrial development, on a large scale. "A man should be proud of the place he lives; He should live so that his place will be proud of him...VIZAG STEEL is PRIDE of STEEL".

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CONFLICT OF INTERESTS

The author declares that there is no conflict of interests regarding the publication of this manuscript.

ABBREVIATIONS:

CMMI	Capability Maturity Model Integration
DE	Dust Extraction
ENVISION	Environment Status and Information Online
ERP	Enterprise Resource Planning
ESP	Electro Static Precipitator
GVMC	Green Visakha Municipal Corporation
ISMS	Information Security Management Systems
ISO	International Organization for Standardization
K	Potassium
MT	Metric Ton
MW	Mega Watt
N	Nitrogen
NPSE	Navaratna Public Sector Enterprise
OHSAS	Occupational Health and Safety Assessment Series,
P	Phosphorous
PSU	Public sector unit
QUEST	Name of the software for data generation
RINL	Rashtriya Ispat Nigam Limited
SCADA	Supervisory control & Data acquisition system
TPP	Thermal Power Plant
VSP	Visakhapatnam Steel Plant

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- ii) Research paper on "Excellence through ordination of Front line officers of Utilities department"-Study of RINL,VS in IJAEM,Scopus indexed journal.
- iii) Paper on "Rejuvenating values and mindset to achieve Sustainable Corporate Growth" published in International Seminar by NHRD with SAIL.
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