

7th IAA Planetary Defense Conference

26-30 April 2021, Online Event

Hosted by UNOOSA in collaboration with ESA



Session 10b: Disaster Management

Chairs: L. A. Lewis

Presenters: J. Venkataramaiah | R. Albrecht | T. Kohout

7th Planetary Defense Conference 2021, 26-30 April 21
UNOOSA/IAA, Vienna, Austria
Day 04 : Session 10a Disaster Management

Real Time Community Enabling to Care for Planetary Disaster Risk Reduction

by

Jagannatha Venkataramaiah

Ph. D, Scholar, Civil Engg, JAIN (Deemed –to- be- University), India

Formerly Scientist/Engineer, ISRO

Alumni and First Student of Second Generation, ISU, Strasbourg, France

Hon. Coordinator, People Science Forum, Mysuru, India

E mail : jagsiobbindia@gmail.com

www.oeliusob.com

Summary

Spaceship Earth : Eco Sense is Cost Free

Nature and Community Based Climate, Disaster, Pandemic/Infodemic managing capabilities are invaluable assets.

Community living through disasters since ages for Planetary Defence is active.

Vision and Agenda

*Community Enabling through Space to Care for their Environment.
Participation is the Key to Sustainability,UNCED,1992*

Design: Way Forward

UNESCO/UNEP/IEEP,1977 environmental education objectives guideline model..

A cost free online non-formal space education outreach model designed..

Ten weeks one hour a week creative response on planetary defence by students.

5-9th Std Students/handhold resource persons, schools and community.

Community enabling Space Outreach model ; inclusive and no bar planned.

Results :

Mindfulness and planetary disaster risk reduction by creative response.

Cost Free online activities amongst students and family for Planetary Defence.

Real Time preparedness by students and family deployed

Space Eco Literacy Vision for Planetary Defence at Community Level

Space Ship Earth what Next ?

The Indian Ethical Vision

“ Mans future in Space will be determined mainly by socio-cultural imperatives rather than Science and Technology Alone” :

“ Individual liberty and democracy along with deep and active concern for all living beings on Earth are essential features of a civilized society”

+ Prof. Satish Dhawan

Former Chairman ISRO, India



First Photo of Earth from Moon, 1966 ,

“There is a need for a revolution in mankind's thinking as basic as the one introduced by Copernicus who first pointed out that the earth was not the centre of Universe”

+ Lester B Pearson, 1957 Nobel Prize for Peace.,

Space For Humanity : Together to Space to Enrich all on Earth.

+ Jean-Michel Contant, IAA, 2010

Earth Day Network, 22 April 2021

Theme : Restore Our Earth

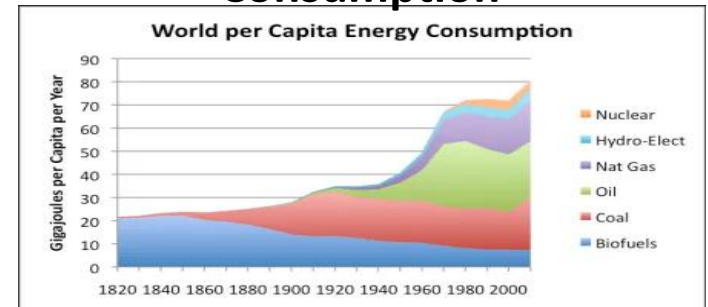
An Agenda for Individual and Community Life Style Focus

Convergence on

Climate Action Network (CAN) is a powerful global network of more than 1,500 civil society organisations in over 130 countries driving collective and sustainable action to fight the climate crisis and to achieve social and racial justice. CAN convenes and coordinates civil society at the UN climate talks and other international fora.

Indications : Energy

Over one Century, 3 Times Population Increase, but 32 times Primary Energy Consumption



The reality is stranger than Fiction:

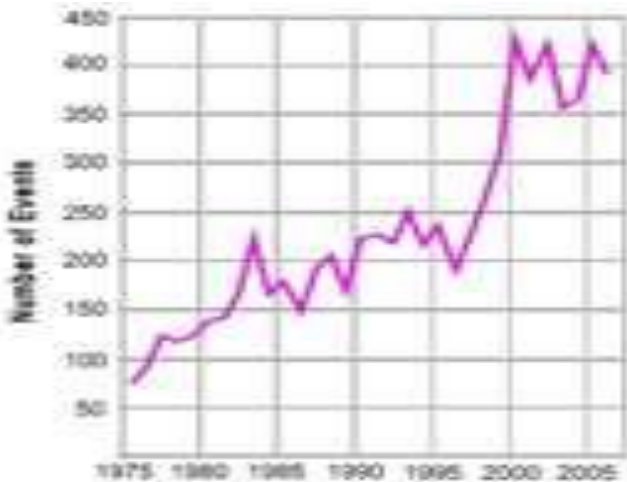
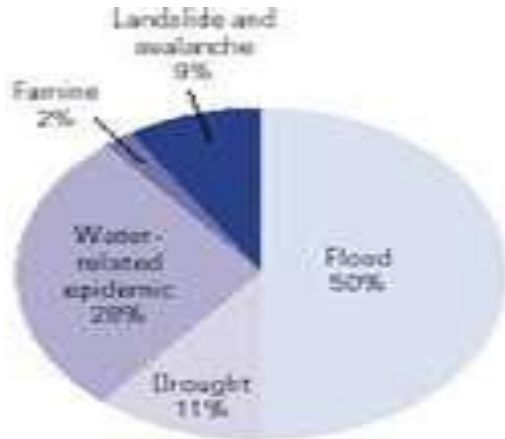
Majority of People on Our only home denied basic decent human quality of life at the cost of drug trafficking, war and Defence and counter Space .

+++++

“Inequality Challenges Well Being”.

+ B R Ambedkar.

Climate Change : Planetary Threats Within



- The frequency and intensity of natural disasters are also growing rapidly worldwide. 50 per year in 1900 to 200 per year in 2000.
- The Climate Impact due to Floods and Famine in the state of Karnataka, India is estimated at INR 15400 Crores, 2019-20.

Disasters : Planetary Threats Within :

Community Enabling to Take Care of its Environment

Decentralized Governance not adequate

The Sendai Framework, UN

The Sendai Framework on Disaster Risk Reduction (2015-2030) is an ambitious agreement that sets out the overall objective to substantially reduce disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.

International Disaster Space Management
United Nations International Conference
on Space-based Technologies for Disaster
Risk Reduction - "Building Resilience through
Integrated Applications" UNOOSA, 2017

EM-DAT

The International Disaster Database

Centre for Research on the Epidemiology of Disasters-CREDA

- EM-DAT: DISASTERS OF THE WEEK
- Week 12-2021: March 15 - March 21
- **Natural disasters:**2021-0162 Floods; Kinshasa area, Congo (Dem Rep)
2021-0164 Flash floods; Luanda area, Angola
2021-0165 Floods and landslides; Java, Indonesia
2021-0166 Tornadoes; Louisiana, Alabama and Mississippi, United States
2021-0167 Earthquake; Berjaya province, Algeria
2021-0168 Flash floods; Brazzaville area, Congo
2021-0169 Floods; New South Wales, Australia
2021-0170 Floods; Loreto region, Peru
2021-0171 Severe storms; Northern and eastern provinces, Thailand
- **Technological disasters:**2021-0172 Road accident; near Goma, Congo (Dem Rep)
- Week 11-2021: March 08 - March 1

Impacts

Case Study

Water Insecurity for Climate Disaster a Global threat



- **Morocco:** The Sidi Boughaba reserve, the last freshwater lake in West Morocco, is experiencing severe drought and depletion of ground water. This is drying up wells and affecting livelihood of many families in the area. It is linked to climate change. Urgent climate action and support for adaptation measures is the focus. It is one sample of thousands of severe impacts of planetary threats within.

Vision, Policy & Agenda for Disasters In India



National Disaster Management Act 2005 is revoked for all disasters both Natural and Technological:

Activities embarked are ,

- Capacity building
- Impact assessment
- Promotion of scientific and technological research and systematic observation
- Education , training and public awareness
- Enhancement of International Cooperation

COVID 19 Pandemic

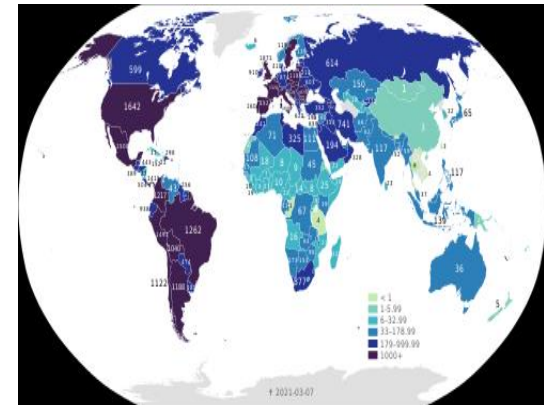
A case of public health architecture disaster

Need of a Tunnel Effect Life Style

- Coronavirus Cases **135,771,825**
- of which **102,374** in severe condition
- Deaths **2,934,348**
- Recovered **109,179,759**
- The coronavirus COVID-19 is affecting **219** countries and territories

(As on 10 April 21)

COVID-19 Pandemic



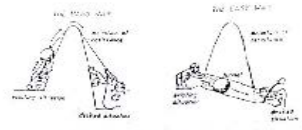
Tunnel Effect is Eco sense cultural /technological Synergy

Planetary Pandemic Disaster : Living Through with Omnipotent Science of Life Styles

COMMUNITY EMPOWERMENT

- Action : 01 : Provide Communities and individuals with access to resources and an equitable share in managing them.
- Action : 02 : Improve exchange of information, skills, and technologies
- Action : 03 : Enhance participation in conservation and development
- Action : 04 : Develop more effective local governments.
- Action : 05 : Care for the local environment in every community
- Action : 06 : Provide financial and technical support to community environmental action.

(Source: Caring for Earth : IUCN/ UNEP/UNESCO, 1991)



Use a Tunnel Effect for an easy way

ECO SENSE IS COST FREE & OUR CULTURAL HERITAGE

Concept and Design

Prof. V. Jagannatha
Formerly Scientist/Engineer ISRO
With
Prof. Shobha Jagannatha, Botany
Er. Sahana.J. Fitness Trainer, Zumba
Dr. Spandana.J, MS, Surgery Student
Ar. Sadhana. J, PhD Student
PSF

A unit of Karnataka Vigyaan Parishat, Mysuru

Translated by.....

Network

Earth day Week April 20

<https://www.wedonthavetime.org/event/earthdayweek>

COVID 19 District Emergency Control Room

107, 0821-2423800

Central Hel Line

011-23978046/23314444

Ministry of Health & Family Welfare, Gol

Helpline

Frequently Asked Questions

1075

011-23978046

ncov2019@gmail.com

www.mohfw.gov.in

Information

World Health Organisation with Online Status, Personal

Protection, Education and Training

[https://www.who.int/emergencies/diseases/novel-](https://www.who.int/emergencies/diseases/novel-coronavirus-2019)

coronavirus-2019

How soap kills the coronavirus : Science

<https://youtu.be/-LKVUarhtvE>

Action

Prevention by simple behavioural changes

[https://www.youtube.com/watch?v=1APwq1df6Mw&action=](https://www.youtube.com/watch?v=1APwq1df6Mw&action=here)

here

Gol

Home Quarantine Guidelines

[https://www.ndtv.com/india-news/coronavirus-outbreak-](https://www.ndtv.com/india-news/coronavirus-outbreak-health-ministry-issues-guidelines-for-home-quarantine-as-coronavirus-spreads-2193905)

health-ministry-issues-guidelines-for-home-quarantine-as-

coronavirus-spreads-2193905



Ibn Sina was a Persian polymath who is regarded as one of the most significant physicians, astronomers, thinkers and writers of the Islamic Golden Age, and the father of early modern medicine, (980-1037)

Earth Day April 22, 2020 : Climate Action

COVID-19 RESILIENCE IN OUR HANDS



Resort to Soap Wash & Prevent Covid-19

...Because the soap molecules are so similar to the ones making up the outer layer of the virus, the molecules in the lipid bilayer are as strongly attracted to soap molecules as they are to each other.

This disrupts the neatly-ordered shell around the Covid-19 virus, dissolving it in the running water and killing the virus.

--- Sara Rigby, UK, 13th March, 2020 at 08:00 ,
Science Focus, The Home of BBC Science Focus Magazine

Upasaki Prof V M Parvathamma
Memorial Space Eco Literacy and sky watch Lab
People Science Forum
(A unit of KRVP)

"Panya Sadana" 173, 3rd A Main D Block, Vijayanagar 3rd
Stage

Mysuru 570030, India

jagsiobbindia@gmail.com

+91-9448050595

Any Disaster Manmade or Natural is a Challenge to our
Dhamma, Karuna and Compassion. You are your light.
+ The Buddha

Page 01 of 02

Flier on Pandemics brought out in Lockdown 2020; Copies in English, French, Spanish, German, Japanese, Sanskrit, Hindi, Urdu, Kannada, Telugu
Confidence Building at Community Levels is Enabling for Disaster Risk Reduction

Planetary Pandemic Disaster : Living Through with Omnipotent Science of Life Styles, Con'td

Public Health endangering Pandemic Viral, Bacteria and Chemical, Nuclear and Bio Warfare Episodes, Impacts and Lessons Learnt :

Sl No	Episode	Year/Location	Source/Symptoms	Impact Global, India,	Diagnosis/Preventive- Control measures/Lessons learnt
01	Covid-19 Corona Virus	Nov 2019/Wuhan, China	BAT, Wet Market Unhygienic Cold, Fever, Sore throat, Running nose Respiratory difficulties, dry Cough, Infectious.	Wuhan city, in 45 days infected 45,638 killed 1018 in 27 countries, WHO declared Pandemic.	Infection through contact. Lock down for 3 weeks, Individual social isolation enforced, preparedness and health care reinforced, disaster status announced. Livelihood schemes announced. Indian Traditional Food habits having good immunity realised
02	H1N1 Influenza A Virus Swine Flu	April 2009/ Mexico and USA	Virus that infect the respiratory tracks of Pigs cause Swine Flu/ Barking Cough, respiratory illness, in human since 1977. First global flu Pandemic	4000 deaths in USA, 2009-10.	Swabs from throat/Rest, Pain reliever, fluids, anti-viral medicines, IV fluids. Public Health Architecture totally a lowered priority all over the world. No preparedness for Pandemic.
03	SARS Severe Acute Respiratory Syndrome	Nov 2002/Yunnan China	Intermediary of civets to cave dwelling horseshoe bats in Yunnan province, Pneumonia like.	Travelled across 24 countries 800 people killed and infected over 8000 in 27 countries. No known transmission has occurred anywhere in the world since 2004.	SARS showed how quickly infection can spread in a highly mobile and interconnected world. Surgical masks will provide barrier protection against large droplets that are considered to be the primary route of SARS.
04	Spanish Flu/ Deadly plague	1918/Spain Pandemic	H1N1 Virus with genes of avian origin. It spread worldwide during 1918-19, it was identified in US military personnel in Spring 1918.	500 million people or one third of the world's population got infected and deaths estimated to be at least 50 million world wide	1918 H1N1 virus has been synthesized. With no vaccination to protect against influenza infection and no antibiotics to treat secondary bacterial infections, control efforts worldwide were limited to non-pharmaceutical interventions such as isolation, quarantine, good personal hygiene, use of disinfectants, and limited gatherings.
05	Plague Infectious Fever	Oct 1347/12 ships from the Black Sea docked at the Sicilian port of Messina, Europe	Bacteria-Yersinia Testes/Bitten by infected Rodent Flea, Cause for 14 C century Black Death one-third of Europe's population died.	100 M deaths in Asia/Africa/ Europe, 6 M deaths in India.	1994 plague in India was an outbreak of bubonic and pneumonic plague in south-central and western India from 26 August to 18 October 1994. 693 suspected cases and 56 deaths were reported from the five affected Indian states. Isolation Camps.
06	Malaria /origin primates	Prehistory, to 21 Century.	Humans may have originally caught Plasmodium falciparum from Gorillas.	200M Patients per year, kills 600,000 per year, Endemic in 100 countries.	1000s of years, traditional herbal remedies. The first effective treatment for malaria bark of the cinchona tree, quinine. Early twentieth century, mosquito control measures such as widespread use of the insecticide DDT, Biological control.
07	Bio-Warfare Bacteria, Viruses, Insect and Fungi	1133, 1346 1495, 1763, 1863/ Italy, Japan, Spain, UK,USA	Military action by Countries/Water wells poisoned in China by Japanese, Wine with blood of Leprosy patients in Spain by Italy, Blankets from Small Pox Patients by UK in Native Americans.	Infection technology using abused in Wars against enemies. Eliminated soldiers in Wars in America, Europe and Asia.	Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Attacks - www.cdc.gov/niosh
08	Nuclear War and Testing	Little Boy, Hiroshima, Japan 6 Aug, 1945 Fat Man, Nagasaki, Japan 9 Aug, 1945	Military action by USA on Japan/ Nuclear Technology, 80,000 Killed 10000s maimed in 3 Sq Km area. And 40,000 Killed.	2000 Nuclear explosions made on Land, in Ocean and in Air. 9 countries own 14,300, it was 70,300 in 1986.	Anti-Nuclear movement : 1970-80s : 30,000 women activists in 60 cities in the USA. 1982 One Million people marched in New York City.

Source : On Line WHO, global, national references.

"Hand washing is one of the most effective ways to prevent the spread of disease "
+ Dr. Ignaz Schlemiels, Hungarian Physician, Father of Infection Control, 1847

Community Living through ages through Natural and
Technological Disasters are deluged in Human history
through all civilizations.

A Typical Example of a Medicinal Plant Amruta Balli ; 01 /280 useful for Pandemics of Planetary Threat as in COVID19

?

Science is in our Breath Long live the Spirit of Enquiry Science is For All

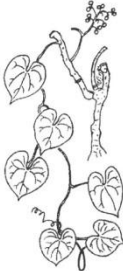
PEOPLE'S SCIENCE FORUM
(Karnataka State Vijnana Parishat Unit)
Founder Patron: Upasaki Prof. V.M. Parvathamma, Syndicate Member, University of Mysore, Mysuru.
"Panya Sadana", 173, 3rd A Main, D Block, Vijayanagar 3rd Stage, Mysuru, India 570030
M: 9448050595, email : jagsiobindia@gmail.com, www.oelusob.com

MEDICINAL PLANTS AS NATURAL AND COMMUNITY BASED SOLUTIONS FOR OUR HEALTH

Dear Eco Sense Concerned,
We have only one home in Universe. That is plants, animals and human beings diversified Earth. At the Earth Summit held at Rio de Janeiro, Brazil, in 1992 more than 160 countries signed a treaty to protect the Earth's biodiversity. Being a signatory to the treaty, India passed the National Biodiversity Act in 2002.
In 2016, The Vivekananda Research Center, Puttur published the book "Aushadeeya Sasya Sampattu (The Medicinal Plants Chest). The book is a rare treasure trove of knowledge about medicinal plants and introduces to us more than 280 medicinal plants. The book was ably put together and edited by Shri. P.S. Venkatarama Daidota, a practitioner of herbal medicine from Panaje, Karnataka, India. The book gives the names of the herbs and medicinal plants in various languages along with their pictures, provides details about their healing properties and methods of preparation and usage. People's Science Forum, Karnataka State Vijnana Parishat, Mysore has taken up a program to create awareness among people about these 280 herbs and medicinal plants. This is to promote their role in Preserving health and ensuring environmentally sustainable living.

SASYA SANJEEVINI 001/280

1. Amruta Balli
Herbal medicine for vomiting.
Names:
Kannada: Amrutha Balli, Amarada Balli, Tanti Beelu.
Tulu: Jantibooru, Amrutha balli
Malayalam: Jittamad
Tamil: Amrutha Valli, Senthil Kodi
Telugu: Pippateegge, Amruthamu
Marathi: Gulavel
Hindi: Gulancha
Sanskrit: Gudoochi
Commercial: Gulavel
English: Heart Leaved Moonseed, Gulancha Tinospora
Botanical: Tinospora cordifolia (wild) Meirs.
Family: Menispermaceae
Uses: Used mainly the stem, leaves, fruits and roots separately.



**Availability of the plant at 'Chandravana', Radhakrishna Marg,
Next to Kukkarahalli Lake, Saraswathipuram, Mysuru**

*Dedicated to: Padmabhushan Dr. H. Narasimhaiah, Founder: Karnataka Raja Vijnana Parishat,
Eco Sense is Cost Free and a Real Cultural Heritage of any Sustainable Society.
Prof. V. Jagannatha, Co-ordinator, People's Science Forum and Formerly Scientist/Engineer, ISRO.
Handout Sponsored by: Dr. Ravi Shankar Shukla, Speech & Hearing Expert, Mysuru.*

28th February 2021: National Science Day

Printed by :
Jyoti Menon,
NTH, CHU, Mysuru

Page 01 of 02

An indigenous Knowledge for COVID19 a manmade technological disaster. This plant has versatile medicinal values for Viral Disaster Risk Reduction also.

A Typical Example of a Medicinal Plant Amruta Balli ; 01 /280 useful for Pandemics of Planetary Threat as in COVID19 Cont'd

AMRUTHA BALLI : A INTRODUCTION OF AN HERB..

- Amrutha Balli helps a person get rid of the disease and rejuvenate life.
- Its ability to put out the leaves several years later after it was cut. it is considered as 'Bhinnaarooha and nectar' (Amrutha). Finger sized succulent stem and the soft skin filled with glands.
- Light green branches, heart shaped soft muscle, and hairs, leaves with 7 nerves, 1 inch leaf, light yellow and white colored flowers, orange and red colored, grain sized fruits,
- Its wiry aerial roots hanging down from the tall trees circle around trees and climb upwards.
- You will get a white powder like nutritious, medicinal substance (Amruta satva) from creepers which are well grown for several years. This creeper plant is grown in several parts of India.

MEDICINAL PROPERTIES

- Fevers, Fevers due to "vata dosha" which have a long gestation periods, heart diseases, inflammations, vomiting, blood disorders, urinary infections, bronchitis and lung diseases, liver diseases, sexually transmitted diseases, etc. reducing grease, increasing the lifespan.
- A creeper which is mentioned in Ayurveda as having special medicinal properties.
- Recent research has shown its acids, and bitterness chemical components are effective in treating diabetes and liver diseases.
- Even though it can be stored for several months, best to use it when fresh.
- The creeper encircles and grows well on the jackfruit tree. Such creepers have special medicinal attributes.
- There is also a tradition where a garland made of the pieces of the stem is worn to treat liver diseases.

METHODS OF USE

- **To treat severe cough:** 15 grams of the stem of the Amrutha balli (tender is better), add black pepper 1/2 Table Spoon, and mix it in lukewarm water (better to drink it at night) once a day. If necessary, you can drink it twice for a day or two.
- For all kinds of vomiting: stem of the creeper. (can be used along with the leaves). 10- 25 grams of the crushed stem and leaves should be mixed with hot water and should be kept in a closed vessel and should be left to cool for 3 hours after cooling) should be squeezed and strained and should be taken often with 1 Table Spoon of honey for three to six days.

Source: pages 85/86, Aushadeeya Sasya Sampattu, P.S. Venkatarama Daidota, practioner of herbal Medicine, Vivekananda Research Center, Puttur, India, email: vcrsputtur@gmail.com

Ayurveda Resource Doctors at Mysuru, India
Dr. Gajanana Hegde, Principal, Government Ayurveda College,(GAC), E mail: dr.hegdegajanana@gmail.com
Dr. Venkatakrishna, Head, Department of wellness, (Swastha Vrutta), GAC, . Email: srisadguru@gmail.com
Dr. Vindya Keshava, GAC, Participant, PSF Space Eco Literacy Weekend 2011,E mail: vindyakeshav@gmail.com

State, national and international websites for information on
Community and natural based solutions
www.kbb.kar.nic.in | www.gamcmysore | www.mohfw.gov.in
www.iied.org | [https:// www.who.int/](https://www.who.int/)

**Proper breathing is Meditation,
Environment friendly living is Yoga.**



Designed by : **You are your light + Buddha.**
JV & SADHANA J

Printed by : MSD BIG PRINTS 9008580560

Page 02 of 02

Amruta Balli Medicinal Plant for Viral Disaster Risk Reduction

Design Guidelines for EESS

UNEP/UNESCO/IEEP, Tbilisi Conference 1977

Tbilisi Declaration (1977)

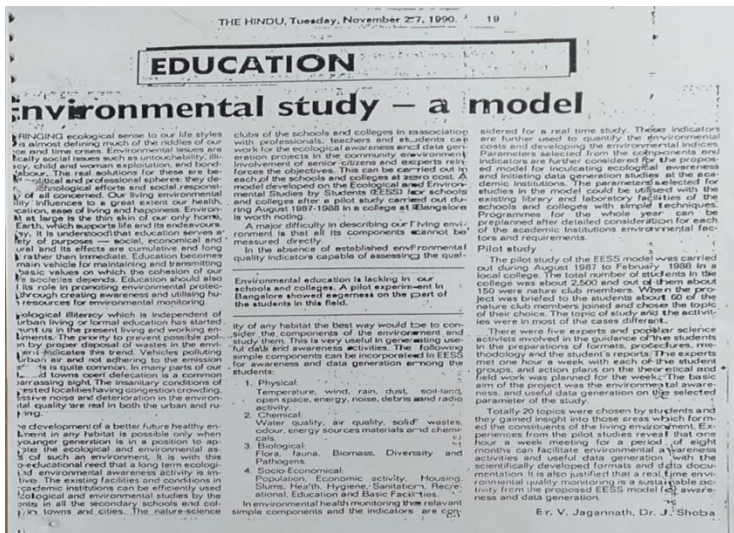
- **The world's first intergovernmental conference on environmental education was organized by the United Nations Education, Scientific, and Cultural Organization (UNESCO) in cooperation with the U.N. Environment Programme (UNEP) and was convened in Tbilisi, Georgia (USSR) from October 14-26, 1977.**
- **Delegates from 66 member states and observers from two non-member states participated. Representatives and observers from eight U.N. agencies and programs also participated. Three other intergovernmental organizations and 20 international nongovernmental organizations also were represented. In all, 265 delegates and 65 representatives and observers took part in the conference.**
- **The Tbilisi Declaration was adopted by acclamation at the close of the intergovernmental conference. The declaration noted the unanimous accord in the important role of environmental education in the preservation and improvement of the world's environment, as well as in the sound and balanced development of the world's communities.**

A Cost Free Model for Space Eco Literacy Ecological and Environmental Studies by Students

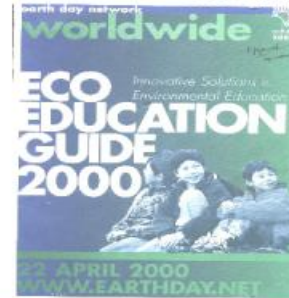
EESS

EESS, 1988 Model based on
UNEP/UNESCO/IEEP 1977 Tbilisi

Cited as one of the 20 best Eco Education
Guide by Earth day Network 2000



Global Best Practice
Earth Day Network
Eco-education Guide 2000



- Reach 4500 Organizations worldwide, 191 countries
- Earth day each year in a population of India networked
- International Citizen day 22 April every year

EESS developed by Scientists from ISRO cited as one of the best 20 Eco-education Model

A Team of Space Scientists from ISRO in 1987-88 create an Informal Environmental Education Model based on UNEP/UNESCO/IEEP, Tbilisi Conference Guidelines. It is one hour a week for 8 months on ecology and environmental studies. It involved scientists, community experts, interface by students which led to EESS model. About 60 students embarked this historical work. Earth day Network 2000 cited EESS as one of the best 20 Eco Education Guide model.

Disaster Management for Community Enabling

THE 'First MILE' IN REACH

ONE LOUD THINKING ON SSA & COUNTER SPACE MANAGEMENT

FOCUS

Multi-Tasking in Space for Humanity enabling (Telemedicine, Skill, Synergy of SATCOM (Conduit) & RS/ GIS (Content), Infodemic and Space Situational Awareness, Counter Space Risk Reduction, as a Commodity, as Knowledge, Information Access at Community Level (First Mile) - Real/ Near-Real time

Community Centered Disaster Management (Global/National)

Community Disaster Risk Reduction Centres

Data Base on best practices in DRR Heritage

Participatory Enabling Centre

CONVERGENT TECHNOLOGIES

- SATCOM - VSAT, WLL, Broadband
- Terrestrial Networks
- RS & GIS Modeling
- Global Networks

SYSTEMS & SERVICES

Early Warning

- Sub-Systems for - Risk Info; Preparedness; Communication, Community Radio, HAM
- Affordable Access
- Voice, Video, Data, Volunteers
- Health, Education, Skill Training, Knowledge
- Pooling community resources, livelihood

GOALS

- Community Resilience
- DRR Heritage plan
- Volunteers database
- Resource database
- Participatory Governance
- Sustained Capacity building/training
- Networking

DRR : Disaster Risk Reduction

SSA : Space Situational Awareness

UNCED Rio Earth Summit, 1992 Take Home for Planetary Defence
Enabling communities to care for their own environments

ACTION POINTS

- **Action : 01 : Provide Communities and individuals with access to resources and an equitable share in managing them.**
- **Action : 02 : Improve exchange of information, skills, and technologies.**
- **Action : 03 : Enhance participation in conservation and development.**
- **Action : 04 : Develop more effective local governments.**
- **Action : 05 : Care for the local environment in every community.**
- **Action : 06 : Provide financial and technical support to community environmental action.**

**Caring for the Earth: A Strategy for Sustainable Living
(IUCN,UNEP/WWF, 1991)**

Real Time Community Enabling Planetary Defence Model

Ten Week One Hour A Week Virtual Non Formal Space Situational Awareness Campaign 21

Week wise topic, Content, Background Literature, UNESCO-UNEP-IEEP,1977 Objectives and On Line Resources

SI No	Week	Topic	Content	Literature	IEEP Objectives ⁷	Useful Home Pages and Notes
01	First 17-23 April 21	NF¹, SSA² and People Science Movement PSM	UNESCO/UNEP/IEEP,1977/ SSA, SEOR ³ PSM in India	UNESCO, 1977, YSA ⁴ , BJVJ, ⁵ PSM	Aw, At, K,S,P	https://en.wikipedia.org/wiki/Science_outreach https://sciencevisnotbadbutthereisbadscience.blogspot.com/2012/11/bharat-jan-gyan-vigyan-jatha.html http://www.oocities.org/y_s_a_2004/about.html#:~:text=Year%20of%20scientific%20Awareness%20-%202004%20The%20idea,sci
02	Second	Mindfulness, IAA⁶ to COSMOS	Space Quest & , Space for Humanity	Celebrating 50 Years of Excellence	At, K	Practice of Ten Paramas www.mahabodhi.info , https://en.wikipedia.org/wiki/Carl_Sagan www.iaaweb.org
03	Third	Space Saga of Self Reliance ISRO	40 Years of ISRO	Space Technology & Social Applications	At, K	www.oeliusob.com Book on Indian Space by Dr. AS Kiran Kumar
04	Fourth	DRR⁷ Sendai Frame Work	EM-DAT ⁸ : UNIDIR :Hiroshima ⁵	UNOSSA ⁹ Sendai 2015-30	K,S	https://en.wikipedia.org/wiki/Hiroshima_Peace_Memorial_Museum https://www.unidir.org/ https://emdat.be/https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf
05	Fifth	Global Counter Space Capabilities	SWF ¹⁰ , CSIS ¹¹ ,	SWF/CSIS 2021 Reports	At, Aw	https://en.wikipedia.org/wiki/Space_Situational_Awareness_Programme https://swfound.org/ https://www.csis.org
06	Six	NEOs¹² – Comets/Asteroids	ISU ¹³	Casandra 2005	K,	https://isulibrary.isunet.edu/doc_num.php?explnum_id=122
07	Seven	6th PDC¹⁴	IAA	6th PDC Summary	K	https://www.lpi.usra.edu/sbag/meetings/jun2019/presentations/Barbee.pdf
08	Eight	7th PDC 2021¹⁵	IAA/UNOOSA	7 th PDC I	S	https://iaaspace.org/event/7th-iaa-planetary-defence-conference-2021/
09	Nine	Ten Action for Caring for Earth	Community Enabling	UNEP/IUCN/WWF 1991	P	https://portals.iucn.org/library/sites/library/files/documents/CFE-003.pdf
10	Tenth	Vision and Agenda	CC,DRR,P&I ¹⁶	Planetary Defence Lifestyle	P	Climate Change, Disaster Risk Reduction, Pandemic and Infodemic Lifestyle for Planetary Defence

Note : #1 NF: Non Formal ; #2..SSA ...Space Situational Awareness.; #3 Space Education Out Reach ; #4 Year of Scientific Awareness; #5 BJVJ Bharath Jana Vigyan Jatha ; #6 : IAA International Academy of Astronautics ; # 7 DRR Disaster Risk Reduction; # 8 EM-Dat : International Disaster Data Base ;#9 UNOOSA The United Nations Office for Outer Space Affairs; # 10 . SWF : Secure World Foundation.; # 11 CSIS Center for Strategic and International Studies # 12 NEOs : Near Earth Objects; #13 ISU : International Space University ; # 14. 6th PDC Planetary Defence Conference ; #15 : 7th PDC Planetary Defence Conference ; # 16 CC DRR P&I Climate Change, Disaster Risk Reduction, Pandemic & Infodemic Resilient Life Style Vision and Agenda

Typical week ,Curriculum

Week # 01

?

PSF

Non Formal Space Situational Awareness Campaign
10 Week FREE Orientation Program 2021
Syllabus, Activities and Evaluation

#####

Week # 01

Time : 60 Minutes

April 17th to 23rd 2021

Duration : Seven Days

#####

Week topic, Content, Background Literature, UNESCO-UNEP-IEEP,1977 Objectives

Sl No	Week	Topic	Content	Literature	IIEP Objectives ⁷
01	First 17-23 April 21	Community Enabling to Care for their Environment by Non Formal means	1)People Science Movement, Education Outreach, 2)Space Situational Awareness	Background Notes and Home pages	Awareness, Attitude, Knowledge, Skill, Participation

Note : Pick any one of the three content for the response

Useful Links

<https://onlinedst.gov.in/Login.aspx>

https://en.wikipedia.org/wiki/Science_outreach

<https://sciencevisnotbadbutthereisbadscience.blogspot.com/>

2012/11/bharat-jan-gyan-vigyan-jatha.html

[http://www.oocities.org/y_s_a_2004/about.html#:~:text=Year%](http://www.oocities.org/y_s_a_2004/about.html#:~:text=Year%20of%20Scientific%20Awareness%20-%202004%20The%20idea,sci)

20of%20Scientific%20Awareness%20-%202004%20The%20idea,sci

<https://www.iafastro.org/about/iaf-committees/technical-committees/space-education-and-outreach-committee-seoc.html>

<https://www.spaceacademy.net.au/intell/ssa.htm>

Submission of Assignments

Assignments to reach by e mail jagsibbindia@gmail.com or by post to " Panya Sadana" 173, 3rd A Main D Block, Vijayanagar 3rd Stage, Mysuru 570030 on or before 23rd April 21 after 60 minutes work in a week. The

inputs on any one of the three content issues as one of the responses in any language

(1) Note(100 words max) 2) Audio (120 Seconds) 3) Poem (5 Paras maximum) 4) Painting (A4 Size) 5) a Photo 6) What I can do. (One Slogan)

Weekly Evaluation:

10 Marks Max :

Attitude, Awareness, Knowledge, Skill and Participation : 2 Marks Each

#####

Vision :

You must be part of the change you wish to see in the World.

+ M K Gandhi

#####

Agenda

Eco Sense is Cost Free and is our Real Heritage and Culture of any sustainable community..

Real Time Community Enabling Planetary Defence Model

Ten Week One Hour A Week Virtual Non Formal Space Situational Awareness Campaign 21

Week wise topic, Content, Background Literature with UNESCO- UNEP-IEEP,1977 Objectives target

Sl No	Week	Topic	Content	Literature	IEEP Objectives ⁷
01	First 17-23 April 21	NF ¹ , SSA ² and People Science Movement PSM	UNESCO/UNEP/ IEEP,1977/ SSA, SEOR ³ PSM in India	UNESCO, 1977, YSA ⁴ , BJVJ, ⁵ PSM	Aw, At, K,S,P
02	Second	Mindfulness, IAA ⁶ to COSMOS	Space Quest & , Space for Humanity	Celebrating 50 Years of Excellence	At, K
03	Third	Space Saga of Self Reliance ISRO	40 Years of ISRO	Space Technology & Social Applications	At, K
04	Fourth	DRR ⁷ Sendai Frame Work	EM-DAT ⁸ : UNIDIR :Hiroshima ⁵	UNOSSA ⁹ Sendai 2015-30	K,S
05	Fifth	Global Counter Space Capabilities	SWF ¹⁰ , CSIS ¹¹ ,	SWF/CSIS 2021 Reports	At, Aw
06	Six	NEOs ¹² – Comets/Asteroids	ISU ¹³	Casandra 2005	K,
07	Seven	6th PDC ¹⁴	IAA	6th PDC Summary	K
08	Eight	7th PDC 2021 ¹⁵	IAA/UNOOSA	7th PDC I	S
09	Nine	Ten Action for Caring for Earth	Community Enabling	UNEP/IUCN/WWF 1991	P
10	Tenth	Vision and Agenda	CC,DRR,P&I ¹⁶	Planetary Defence Lifestyle	P

Note : #1 NF: Non Formal ; #2..SSA ...Space Situational Awareness.; #3 Space Education Out Reach ; #4 Year of Scientific Awareness; #5 BJVJ Bharath Jana Vigyan Jatha ; #6 : IAA International Academy of Astronautics ; # 7 DRR Disaster Risk Reduction; # 8 EM-Dat : International Disaster Data Base ;#9 UNOOSA The United Nations Office for Outer Space Affairs; # 10 . SWF : Secure World Foundation.; # 11 CSIS Center for Strategic and International Studies # 12 NEOs : Near Earth Objects; #13 ISU : International Space University ; # 14. 6th PDC Planetary Defence Conference ; #15 : 7th PDC Planetary Defence Conference ; # 16 CC DRR P&I Climate Change, Disaster Risk Reduction, Pandemic & Infodemic Resilient Life Style Vision and Agenda # 17 : Aw : Awareness, At: Attitude: K: Knowledge: S: Skill: P : Participation

Week # 01 Background

?

PSF

Non Formal Space Situational Awareness Campaign

10 Week FREE Orientation Program 2021

Week 01 of 10

Theme : 1. People Science Movement : In India

2. Space Education Out Reach : Definition

3. Space Situational Awareness : Definition

Background Notes

1.0 PEOPLE SCIENCE MOVEMENT OF INDIA

People Science Movement (PSM) is a unique and voluntary movement which is continuously striving to up lift the awareness on Science and Development. PSM has begun during British rule itself India is known for innumerable languages and cultures. Even then there were parallel attempts to promote learning of science in local languages. Among them Kerala Sastra Sahitya Parishat (KSSP) and Assam Science Society are the pioneers. Today at least one such organization in there in every state and union territories. All such organizations have formed an all India group called All India People Science Network (AIPSN). AIPSN is planning, organizing and supporting the activities of its members. Every year it is coming with novel and creative ideas to popularize science, to enhance awareness on S and T development and to use the products and services of S and T for liberation from ignorance, blind beliefs, illiteracy, ill health and exploitation.

Objectives:

1. To popularize science among students, teachers, social activists and general public.
2. To encourage learning of science through mother tongue or state languages
3. To promote the use of benefits of S and T for Education, Agriculture, Health, Sustainability, Progress and Peace by all sections of society.
4. To use S and T as an instrument of liberation from social, economic and societal evils
5. To promote learning of science by the use of simple, effective and entertaining modes of pedagogy

Programmes undertaken and in progress

- a) **For children: 1. Children's festival:** Children of different culture, region, religion stay at one place for 5 to 7 days. Lots of hands on activities like Story telling, singing, dance, role play of scientists, science and environments games. Child of other place has to be the guest of local students home.
2.Children's camp: Children develop and exhibit activity corners. There can be 10-14 corners like Human body, Physics, Chemistry, , Mathematics, Clay modeling, pollution control etc. Each group should explain and demonstrate and has to visit other corners and they have to ask questions to understand concept and model. **3.Know your environment:** Students in group visit a local pond, forest, polluted place, Bus stand, Railway station. They collect data, interview local guardians and give a presentation to other students for discussion to improve that environment.
4.Children Science Congress: With the academic and financial support of National Council of Science and Technology Communication, Department of Science and Technology Govt of India and Vijnana Prasara almost all science clubs and AIPSN members participate in children science congress. Students in groups of 2-4 study for 3-5 months on a particular issue like "Know thy Environment", "Health and Sanitation" etc., using all methods of scientific research. Later they submit their findings both orally and in writing. Such science congresses will be held at district, State and National level. Best presentations are given awards and they will chance to participate in All India Science Congress of top scientists of India.
- b) **Publications:** All the members of AIPSN publish handouts, folders, booklets and books on science, technology and environment in local languages. They have also popular science monthly magazine for children, teachers and general public.
- c) **Jathas:** Jatha is a unique format to popularize and educate general public on the issues of science and society. A team of 12-20 youngsters move from place to place i.e, around 3-4 small towns per day. They perform skits, drama, songs,

Week # 01 Background Cont'd

- a) and interact with local people. Basically it is "Science through Arts "programme. 4 to 5 Jathas will start from different points, travel for 20-30 days, visit around 100 places per one unit and meet at a central part of State or Nation. Bharath Gyan Vijnana Jatha, Bharat Jan Vijnana Jatha, Total Literacy Campaign are some of the notable Jathas. Jathas are mass awareness programmes. They have successfully motivated people and people representatives to take up adult literacy programme, sanitation , primary health awareness and to protect local water resources etc.
- b) **Scientific awareness programs:** Creating interest in Astronomy, identifying stars, clusters, galaxies by naked eye observation during night, Safe viewing of solar eclipse exposing miracles, debunking blind beliefs and the need to use method of science to solve problems and to harness solar energy etc., have been continuously organized by AIPSN members.
- c) **People Science Congress:** AIPSN organizes people science congress for 3 days, where experts and grass root activists meet and discuss on current problems in Agriculture, Education, Health, Communication and Development. Later they come out with solutions, suggestions and action plan for mass awareness and implementation.
- d) **Woman and Science :** 'Samatha' an unique programme specially meant for women, problems faced by female children, ignorance about "periods" in women and such other issues are discussed. Importance of educating girls and need to learn science are conveyed by using print, digital and oral media.

The above mentioned activities are only some of the programmes undertaken by the members of AIPSN. It is lead by vibrant volunteers, teachers, students and people friendly social and science activists and above all socially conscious scientists. They mobilize financial support from sale of Science Books, Science toys, and donations.

2. Space Education Out Reach “: Basics

Quote "[W]e are told that, although the arguments for planetary exploration are widely understood in government, they are not supported by the people. We are told that spending money on planetary exploration – on the discovery of where we are, who we are, what our history and fate may be – is unpopular, that it is a political liability to support such ventures.

... And yet there is evidence of enormous support and enthusiasm for the exploration of the planets. We can see it in the popularity of motion pictures and television programs on planetary themes; in the topics discussed in the burgeoning set of science fact magazines, and in the success with which on this subject have recently been greeted." Unquote.

+ Carl Sagan, The Adventure of the Planets, The Planetary Report, 1 December 1980

Ref : <https://www.planetary.org/outreach>

3.0 An Over View of Space Situational Awareness

In the broadest sense, Space Situational Awareness may be defined as a knowledge of the energy and particle fluxes in near-Earth space, natural and artificial objects passing through or orbiting within this space, including the past, present and future state of these components. The realm of near-Earth space may be left rather vague at this stage. It is definitely within cis-lunar space, but extends to an Earth-radius of at least 100,000 km to include nearly all man-made objects currently in orbit.

Ref : <https://www.spaceacademy.net.au/intell/ssa.htm>

The Future of mankind in Space is determined by socio-cultural imperatives rather than Science and Technology alone.
+ Prof. Satish Dhawan,

(Note ! : Written by, Prof. HSN,PSM Organizer for over four decades in India
2 & 3 Notes compiled by Prof.JV, Alumni SHSP 2011 , ISU, Strasbourg, France

Week # 01 Syllabus Guidelines and Evaluation

?

PSF

Non Formal Space Situational Awareness Campaign

10 Week FREE Orientation Program 2021

Syllabus, Activities and Evaluation

#####

Week # 01

Time : 60 Minutes

April 24th to May 01st 2021

Duration : Seven Days

#####

Week topic, Content, Background Literature, UNESCO-UNEP-IEEP,1977 Objectives

Sl No	Week	Topic	Content	Literature	IEEP Objectives ⁷
01	First 24 th April to 01 May 21	Community Enabling to Care for their Environment by Non Formal means	1)People Science Movement, 2)Space Education Outreach, 3)Space Situational Awareness	Background Notes and Home pages	Awareness, Attitude, Knowledge, Skill, Participation

Note : Pick any one of the three content for the response

Useful Links

<https://onlinedst.gov.in/Login.aspx>

https://en.wikipedia.org/wiki/Science_outreach

<https://scienceisnotbadbutthereisbadscience.blogspot.com/>

2012/11/bharat-jan-gyan-vigyan-jatha.html

http://www.oocities.org/y_s_a_2004/about.html#:~:text=Year%20of%20Scientific%20Awareness%20-%202004%20The%20idea,sci

<https://www.iafastro.org/about/iaf-committees/technical-committees/space-education-and-outreach-committee-seoc.html>

<https://www.spaceacademy.net.au/intell/ssa.htm>

Submission of Assignments

Assignments to reach by e mail jagsiobbindia@gmail.com or by post to “ Panya Sadana” 173, 3rd A Main D Block, Vijayanagar 3rd Stage, Mysuru 570030 on or before 23rd April 21 after 60 minutes work in a week. The inputs on any one of the three content issues as one of the responses in any language

(1) Note(100 words max) 2) Audio (120 Seconds) 3) Poem (5 Paras maximum) 4) Painting (A4 Size) 5) a Photo 6) What I can do. (One Slogan)

Weekly Evaluation:

10 Marks Max :

Attitude, Awareness, Knowledge, Skill and Participation : 2 Marks Each

#####

Vision :

You must be part of the change you wish to see in the World.

+ M K Gandhi

#####

Agenda

Typical Results

SEL SW Model 04 Case Study

Results: 3.4.04.1

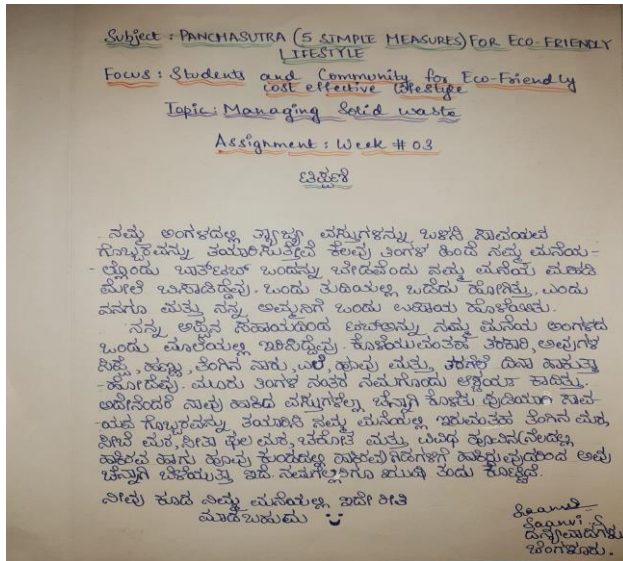
Subject: "Pancha Sutra" ; 5 Simple measures for eco friendly lifestyle

Focus: Students and community for space eco literacy

Topic: Managing household solid waste

Assignment: Week # 03

Output: An eco life style adaptation documentation NOTE



" In our backyard solid waste is used for making compost. A bath tub was discarded and thrown on the terrace. One edge was damaged. Myself, mother and father got a unique idea. Daddy helped us to get the tub to a corner. Vegetables and fruits waste, coconut fiber, dry leaves, flower were piled up for months. After three months we got a surprise waiting for us. All the organic waste had degraded to compost. The compost manure was freely available. At home, coconut trees, guava fruit trees, flowers in pots and on ground are getting the nutrients free of cost. This has brought immense joy for all of us. You may also, embark on this one of the five simple measures of eco friendly life style".



Ms. Saanvi S.

Student, 8 Std,

SVEC School,

Bengaluru, India

D/o: Smt/Shri. Krishna, Bengaluru

(Roughly Translated by JV)

Resource Person:

Smt. Shilpa. S. EE, Mudabidri, DMA, Gok

Typical Out come of Space Eco Literacy : SEL SW2020 Week No.01/10
Subject: Climate Change

Painting

Climate Change

By

ORJONKHAM TIKHAK, 9th Std
Mahabodhi Carla School,
Mysuru

Handhold : Teacher:
Mr. Nirbhay



Typical Out come of Space Eco Literacy : SEL SW2020 Week No.08/10
Subject: Space Explorations Focus : Space Age, Space Quest, Space Explorations
Focus : Space Age

POEM: SPACE DREAM

Come-on, hurry up the space craft is waiting for you!

Let us go u to the Space and explore something new

Wroome..Vroom..Set go

Will see blue green our mother planet first,

Followed by beautiful and bright Venus, with Smartness like me.

Later reddish brown mars with layers of dust

Will also see other celestial bodies, together you and me

I was dancing and singing merry amid stars along with pets and friends

My father: splashed water on my face and awaken me

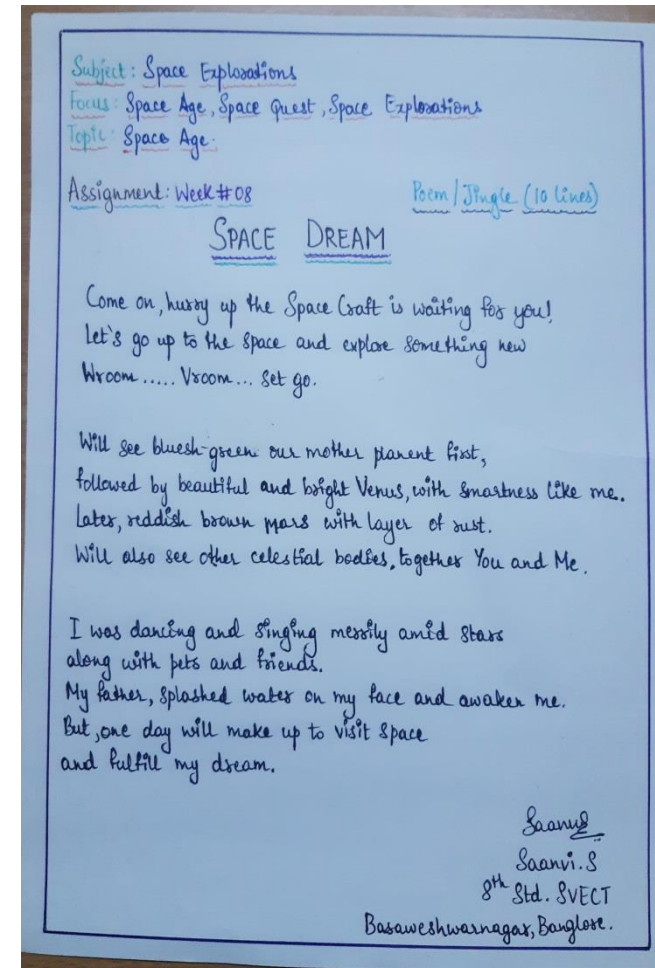
But one day will make up visit Space and fulfil my dream.

By

Ms. Saanvi. S

8th Std, SVECT, Blore

Hand Hold : Mrs. /Mr. Krishna



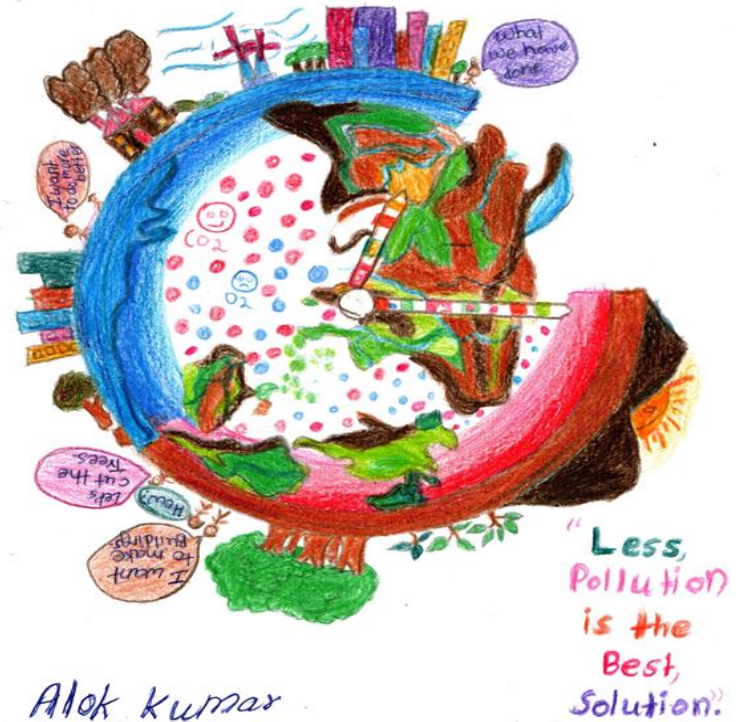
Typical Out come of Space Eco Literacy : SEL SW2020
Week No.01/10
Subject: Climate Change

Painting

Climate Change

By

- Alok Kumar,
6th Std, Mahabodhi Carla
School, Mysuru
- Handhold : Teacher:
- Mr. Nirbhay



Selected/References/Citations

- S. Dhawan, 1986, STAR WARS-The Arms Race in Space, Lecture to Peace Conference, Bangalore, 1986
- Climate Action Network , CAN : <https://climatenetwork.org/>
- Earth day Network : www.wedonthavetime.org
- Lester B Pearson, https://en.wikipedia.org/wiki/Lester_B._Pearson
- Jean-Michel Contant, Celebrating 50 Years of Excellence, International Academy of Astronautics, www.iaaweb.org
- Sendai Framework 2015-30, <https://unece.org/sendai-framework>
- EM-DAT, The International Disaster Database, Centre for Research on the Epidemiology of Disasters-CREDA : <https://emdat.be/>
- Draught and Water Scarcity the last freshwater lake in West Morocco , <https://us6.campaign-archive.com/?u=5daa884f612c9e7758db6fad2&id=766e968f22>
- <https://un-spider.org/news-and-events/events/united-nations-international-conference-space-based-technologies-disaster-0>
- UNEP/UNESCO/IEEP, Tbilisi Conference 1977
https://en.wikipedia.org/wiki/Environmental_education
- Caring for the Earth: A Strategy for Sustainable Living
- (IUCN,UNEP/WWF, 1991) Caring for the Earth: A Strategy for Sustainable Living IUCN,UNEP/WWF, 1991
- R.B.Adams, et al., 2003, Planetary Defence : Options for Deflection of Near Earth Objects, 39 AIAA/ASME/SAE/ASEE: Joint Propulsion Conference and Exhibit, Hunts Ville, AL, July 20-23,2003
-

Weekly Links and Web Sources Shared with Students and handhold for a week long one hour assignment for creative responses

Useful Home Pages and Notes
https://en.wikipedia.org/wiki/Science_outreach https://sciencevisnotbadbutthereisbadscience.blogspot.com/2012/11/bharat-jan-gyan-vigyan-jatha.html http://www.oocities.org/y_s_a_2004/about.html#:~:text=Year%20of%20Scientific%20Awareness%20-%202004%20The%20idea,sci
Practice of Ten Paramas www.mahabodhi.info , https://en.wikipedia.org/wiki/Carl_Sagan www.iaaweb.org
www.oeliusob.com Book on Indian Space by Dr. AS Kiran Kumar
https://en.wikipedia.org/wiki/Hiroshima_Peace_Memorial_Museum https://www.unidir.org/ https://emdat.be/https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf
https://en.wikipedia.org/wiki/Space_Situational_Awareness_Programme https://swfound.org/ https://www.csis.org
https://isulibrary.isunet.edu/doc_num.php?explnum_id=122
https://www.lpi.usra.edu/sbag/meetings/jun2019/presentations/Barbee.pdf
https://iaaspace.org/event/7th-iaa-planetary-defense-conference-2021/
https://portals.iucn.org/library/sites/library/files/documents/CFE-003.pdf
Climate Change, Disaster Risk Reduction, Pandemic and Infodemic Lifestyle for Planetary Defence

Acknowledgement

With

Dr. Shobha J, Prof of Botany, University of Mysore, Mysuru, India,
Er. Sahana J, MS2011, ISU, Zumba International Trainer, Bengaluru, India

Dr. Spandana J, Student MS in General Surgery, New Delhi, India

Ar. Sadhana J, Ph.D. Scholar, Environmental Psychology, UoS, UK

And

Mentors, Teachers, Students and Volunteers

in the development of EESS Model 1988 at MCC Bengaluru , Community Eco Literacy over 350 Sundays from 2000 at Kukkarahally Lake Mysuru, Ten Sundays Family Space Eco Literacy at University of Mysuru, 2011, along with Young Students 5 to 9 std with a handhold in Space Eco Literacy and Sky Watch Orientation Program March – Oct 2020 : Virtual Model : LOCKDOWN Output

now

Non Formal Space Situational Awareness for Students with a handhold for Planetary Defence Life Style

NF-SSAC 21

Sincere thanks are also to Teachers at International Space University, since SHSP 2011 at UoSA Adelaide Australia. And colleagues at Indian Space Research Organization, since 1984.

and

UNOOSA/IAA



AUSTRIAN
SPACE FORUM



Planetary Defense Conference 2021, Vienna, Austria

Towards Plans for Mitigating Possible Socio-economic Effects due to a Physical Impact of an Asteroid on Earth

Rudolf Albrecht

Austrian Space Forum, Innsbruck; Austria

rudolf.albrecht@gmail.com

Mohammed H. I. Dore

Dept. of Economics, Brock University, St Catharines, ON, Canada

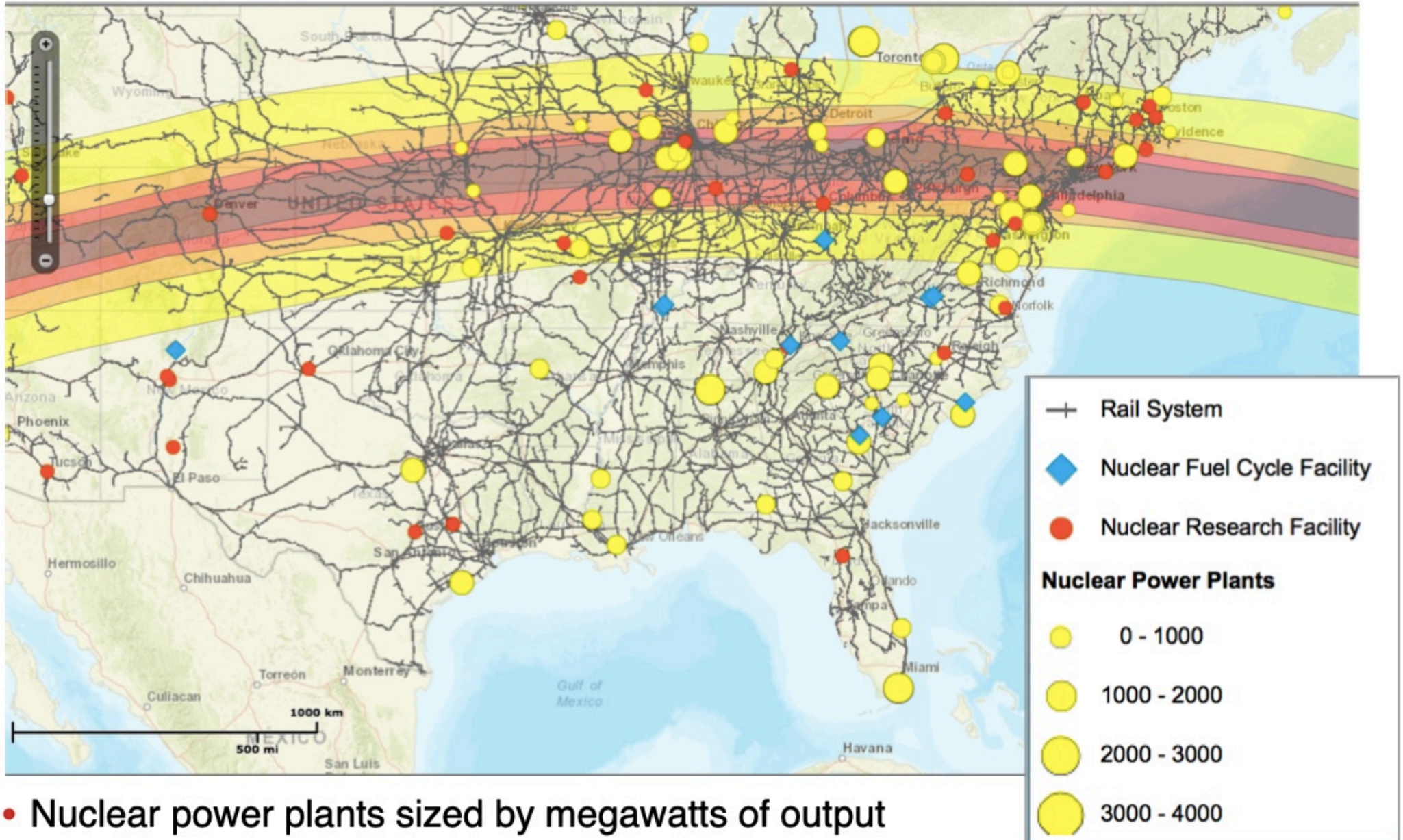
mdore@brocku.ca

The Mitigation Scenario

- Assumption: possible impact of a 100+ meter object in 5 to 10 years.
- Mitigation to be attempted
- UN/COPUOS: awareness, preparation, coordination
- IAWN: discovery, warning
- SMPAG: possible technical solutions
- International Community: planning, decisions and funding
- Local/regional government: implementation
- Media: Education and information
- Space Agencies, aerospace industry: develop technological solutions
- *The COVID experience shows that this chain might not work as expected*

US Infrastructure at Risk

Barbara Jennings (Sandia National Laboratory), Bill Fogleman (GRIT)



- Nuclear power plants sized by megawatts of output

Possible economic effects of an impact (*)

- 1. Damage up to 5 billion \$, fatalities up to hundreds, 10^{*4} injured. Local infrastructure damaged. Example; 1989 San Francisco earthquake. Recovery: months. Can be handled by one country
- 2. 5 - 20 billion damages, 10^{*4} killed, 10^{*5} injured/homeless. Local infrastructure destroyed. Example: 1995 Kobe earthquake. Recovery: years. Can be handled by countries
- 3. Several 100 billion \$ in damages, loss of a major city (e.g. San Diego). 10^{*5} fatalities, 10^{*6} injured, 10^{*6} homeless. Loss of regional infrastructure. Loss of regional governance. Recovery: many years. Requires international collaboration.
- 4. damage in the trillions of \$, 10^{*6} fatalities. (e.g. New York City; PDC 2019!). Major loss of infrastructure, cascading effects., domestically and internationally. Recovery: decades. Requires global collaboration.
- 5. Loss of a whole country. Depending on the country this might be a serious blow to the global economy (Switzerland, UK). For a developing nation this means financial default, with all consequences to the creditor nations/institutions. Recovery: many decades. Requires global collaboration
- 6. Global catastrophe. All bets are off

(*)Dore, M. "The Economic Consequences due to Asteroid and Comet Impacts".

In: "Asteroid Impacts on Human Society" Springer 2007.

The mechanisms of the economy and the **pre-encounter** uncertainties

- For a working economy the following elements are required (but not necessarily sufficient)

Production units:

Will they continue to be available? How long? Will the work force be available? How long? Will maintenance work be performed? Will spare parts be delivered? Will power be available? How long?

Customer-producer communication

Will there be customers? Will there be demand? Will communication channels be available? How reliable will they be? Will the road/rail infrastructure be available? Will customer preferences change?

Payment system:

Most payments are electronic. Will the system remain available? Will the currency remain stable? Serious devaluation will have consequences for the value of the currency reserves world wide. Cryptocurrencies? Barter? Taxation? Developing countries? Corruption? Fraud? Black markets?

Banking system:

How reliable will it be? Will there be a shortage of cash? Will people still accept computer payments? Availability of loans?

Investor confidence:

All investments in or near the impact corridor will slow down or stop. Insurance? Hedging? Short selling? Predatory buying? Fraud? Fake news? Rumors?

Mechanisms, cont'd.

Markets (stocks, commodities, real estate):

Real estate prices in or near the impact corridor will fall. Mortgages will default. People might sell off assets and buy durable goods. Stocks will fall. Some commodities will spike. Futures contracts and other derivatives will behave erratically. Trading might have to be stopped.

Legal system, rule of law, enforcement:

Will the legal system continue to work? How long? Will law enforcement agents be available? Can fraud, embezzlement, loan defaults, etc. be prosecuted? Will there be looting, vandalism?

Central bank, federal reserve:

Will the currency remain stable? Will the national authorities be able to support the currency? (Fiat money is not backed by commodities, but only by the confidence in the financial construct).

All tied together by IT:

Will it continue to be available and reliable? For whom? Conditions, priorities? Saturation? Cyberattacks?

Problem: since the economy is multi-factorial there is no set of conditions which guarantees stability

- **There is a major difference for the pre-encounter consequences, especially in the case of the possible impact of a large object, which might be detected years ahead of time and for which the impact probability increases and the impact location is uncertain during this time. Additional uncertainty will be introduced by a mitigation mission which might only be partially successful, but which will change the impact location in unforeseen ways.**

Example: 9/11 Lost Wall Street for a few days

Uncertainty: for about one week it was not clear whether and where the attacks might continue.

The Federal Reserve added \$100 billion in liquidity **per day**, during the three days following the attack, to help avert a financial crisis and to stabilize the Dollar

Gold prices spiked 30% in London trading. Oil prices also spiked upwards. Gas prices in the United States also briefly shot up, though the spike in prices lasted only about one week.

Currency trading continued, with the US Dollar falling sharply.

The next day, European stock markets fell sharply, including declines of 4.6% in Spain, 8.5% in Germany and 5.7% on the London Stock Exchange.

Stocks in the Latin American markets also plunged, with a 9.2% drop in Brazil, 5.2% drop in Argentina, and 5.6% decline in Mexico, before trading was halted.

Total cost is hard to estimate- Department of Homeland Security was installed, extensive security measures were implemented, “war on terror” was started, Iraq was invaded. Total cost until now as high as \$10 trillion.

Example: COVID

Source: Journal of the American Medical Association, October 2020

Table. Estimated Economic Cost of the COVID-19 Crisis

Category	Cost (billions), US\$
Lost GDP	7592
Health loss	
Premature death	4375
Long-term health impairment	2572
Mental health impairment	1581
Total	16 121
Total for a family of 4	196 475
% of annual GDP	90

Abbreviation: GDP, gross domestic product.



TOWARDS MITIGATION AND RECOVERY PLANNING



OVERALL OBJECTIVE: Coordinate and dovetail the various national country strategic NEO action plans: E.g. see US plan: “NATIONAL NEAR-EARTH OBJECT PREPAREDNESS STRATEGY AND ACTION PLAN”, June 2018.

This Plan has 5 Goals:

Goal 1: Enhance NEO Detection, Tracking, and Characterization Capabilities

Goal 2: Improve NEO Modeling, Prediction, and Information Integration

Goal 3: Develop Technologies for NEO Deflection and Disruption Missions

Goal 4: Increase International Cooperation on NEO Preparation

Goal 5: Strengthen and Routinely Exercise NEO Impact Emergency Procedures and Action Protocols

Goals 1 to 3 can be left largely to the 5 Permanent Members of the UN Security Council. While UN bodies (IAWN , SMPAG and UN/COPUOS) are engaged in discussion, they need to work towards an *eventual UN FRAMEWORK CONVENTION ON NEO THREAT (UNFCNEO)*.

UNFCNEO could parallel the admin structures of the UNFCCC, a with first protocol on international cooperation, and country commitments to plan mitigation actions, modelled on a UN template.

Until a UN FRAMEWORK is agreed, each country should focus on articulating MITIGATION PROTOCOLS.

Consider outline of Mitigation PROTOCOLS next.

PLANNED MITIGATION PROTOCOLS

The MOST IMPORTANT PROTOCOLS Will INCLUDE PLANS TO MINIMIZE DISRUPTION OF GOODS AND FINANCIAL MARKETS, POSSIBLY UNDER EMERGENCY AND/OR MARTIAL LAW, such as:

1. MONETARY ACTION PLANS:

- » To enhance financial confidence and declare illegal goods and financial speculative activity to profit from hoarding essential goods and arms; medical supplies; and pre-emptive trading in financial instruments such as stocks, bonds, and other derivative instruments.
- » Provide enhanced liquidity for retail banks, cash distribution points; closure of stock exchanges (as it happened during World Wars, and at 9/11 attacks).

2. BUDGETARY ACTION PLANS

- Treasury action to back monetary authorities through emergency legislation (as during 2008/9 financial crisis), and the Covid Crisis of March 2020 to March 2021.
- Maintain sources of electricity and drinking water; commandeer & maintain internet network for effective communications
- Army and civil defense forces to set up field hospitals
- Where possible, maintain production activity for food, medicines and other essential supplies
- Maintain the PHYSICAL distribution network for food and medical supplies
- Prevent corporations from seeking to cancel shares or redeem bonds
- Prevent banks from foreclosing mortgages and loans
- Enforce emergency laws to curb illegal and black markets

MITIGATION PLANNING Continued:

3. DISASTER RECOVERY PLANS

- » Most businesses and organizations are required to have a Disaster Recovery Plan. National governments would take control of post impact recovery. Most would draw on past recovery activity after weather related adverse events (e.g. hurricanes, tornadoes)
- » The plan should foresee the gradual relaxation of emergency laws, and an attempt to return to normalcy.
- » The plan should be scalable in response to the magnitude of the threat

CONCLUSIONS

- » 1. The global community faces a significant threat from Near Earth Objects, including objects greater 100 meters
- » 2. These NEOs could cause loss of life on an unprecedented scale, together with destruction of infrastructure in the impact corridors.
- » 3. Such events will have severe national, international and global socio-economic consequences, even in the case of a successful mitigation
- » 4. Global threats require global coordination and cooperation, before and after such an event. This also requires global economic preparation and mitigation plans.
- » 5. Preparing the legal framework ahead of time would be part of good mitigation planning.
- » 6. The current international cooperation through IAWN, SMPAG and UN/COPUOS should converge into a global UN “Framework Convention on the NEO Threat”, with regional and national efforts on mitigation planning and disaster recovery plans.
- » 7. Such a UN Framework Convention could have an administrative structure similar to that of the existing UN Framework Convention on Climate Change (UNFCCC).

■ RAPID EVACUATION OF THE VIIPURI (VYBORG) CITY – EXPERIENCE FROM THE FINNISH WINTER WAR 1939-1940



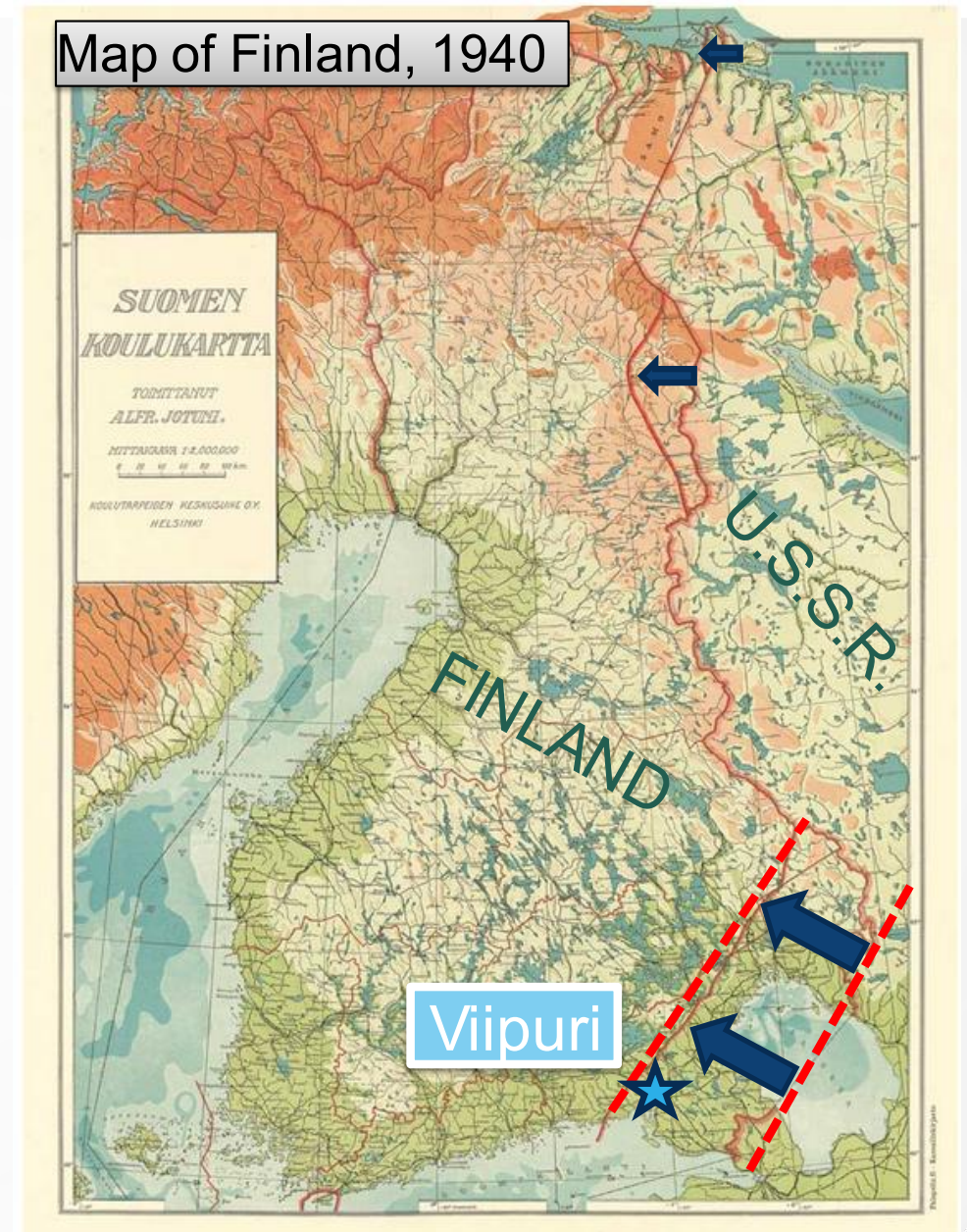
Tomáš Kohout &
Sanni Turunen





FINLAND IN WINTER WAR 1939-1940

- Soviet Union invaded Finland with territorial claims, which led to a defense war on 30 November, 1939
- The conflict ended with the Moscow peace treaty on 21 March, 1940
- Condition for the peace was that Finland would surrender Southern Carelia and other land areas to the Soviet Union
- Over 400 000 people lived in the area
- **Viipuri** was the biggest city to be evacuated (~ 30 km from new border)





EVACUATION OF VIIPURI: INITIAL CONDITIONS

- 86 000 inhabitants
- The whole country was in war: the society was living in exceptional circumstances
- Sudden need for evacuation finally caught Vyborg by surprise: it was not a border town
- It was winter with freezing temperatures
- Complete evacuation needed to be carried out in **one week**
- The threat was visible and imminent: majority decided to evacuate





THE EVACUATION ORDER

- Immediately move your personal belongings next to the nearest road
- Then, immediately travel *through Imatra train station to Ukonlammi*, where you will get more instructions
- Be calm, and calm down others
- Take with you:
 - Proviant for 5 days
 - Warm clothes and blanket
 - Snow cover
 - Valuables, like money and ID
 - Anything else that you are able to carry ~20 km a day
 - Bicycle, skis or a kickspark
 - Only the ill, children or elderly may use horse transport



Käsky siviiliväestön evakuoimiseksi.

Tämä paikkakunta on määrätty evakuoitavaksi.
Teidän on heti siirrettävä irtain omaisuutenne maantien varteen,
jonka jälkeen
Teidän on heti lähdettävä liikkeelle ja mentävä suorinta tietä

häätävän osaston kautta Ukonlammiin.

josta teidät ohjataan edelleen.

Jos kuulut väestönsuojelujoukkoihin, ilmoittaudu heti lähimmälle
esimiehellesi, jolta saat toimintaohjeet.

Ole rauhallinen!

Muista, että pieninkin hermostuneisuus tarttuu ja suurenee sekä aiheuttaa väestössä sekasorron, josta koituu vahinkoa kaikille ja ehkä eniten juuri itsellesi.

Säilytä harkintakykyä ja toimi niin, että se koituu kaikille yhteiseksi hyväksi. Rauhoita muitakin, jos havaitset heissä hermostuneisuutta.

Mitä otat mukaasi?

Ensiksi: Mikäli mahdollista 5 vuorokauden muonan.

Toiseksi: Talvella riittävästi vaatetta ja mikäli mahdollista tyhjän patjapussin ja peitehuovan.

Talvella ota mukaasi lumivaipaksi soveltuva vaate.

Kolmanneksi: Rahat ja arvoesineet sekä arvopaperit.

Neljänneksi: Muuta tärkeätä omaisuuttasi voit ottaa sen verran, että jaksat sen kantaa mukana ottamalla huomioon noin 20 kilometrin päivämarssin.

Viidenneksi: Polkupyörän ja talvella sukset tai potkukelkan.

Vain sairaat, lapset ja vanhukset saavat käyttää hevosajoneuvoja, mikäli toisin ei ilmoiteta.

Tottele viranomaisten antamia määräyksiä tinkimättä, sillä siten vain parhaiten edistät omaa matkaasi. Anna sotilasosastoille ja kuormastolle tietä. Kulje tien reunoja. Mikäli voit, vältä päiväsaikaan kulkemasta avoimilla paikoilla ja teillä.

Muista, että lumivaippa suojaa sinut talvella ja kesällä sulaudut helposti maastoon, jos vältät liikkumista lentokoneiden lähellä ollessa.

Rauhallisuus on suomalainen hyve ja sinä olet suomalainen.

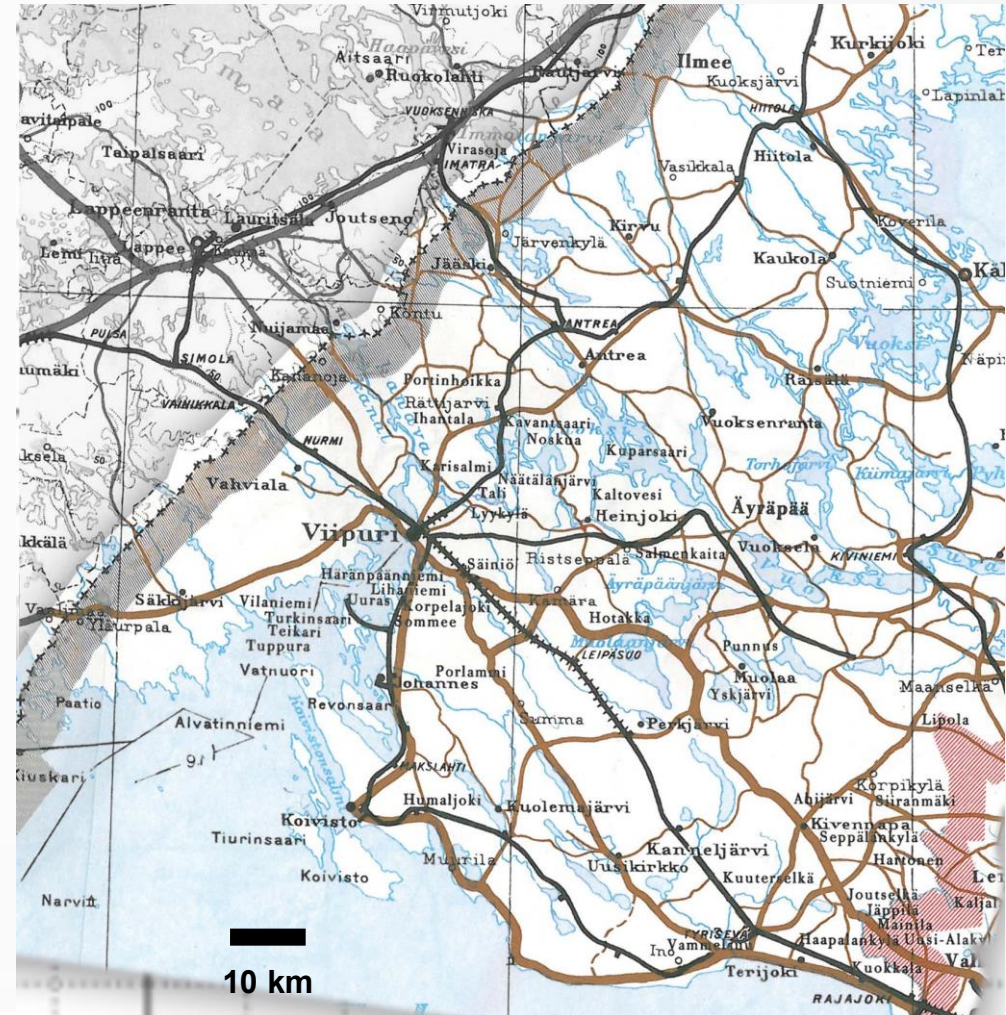
Länsinhallitus.





EVACUATION TACTICS

- Evacuation was voluntary: result from staying would be staying in Soviet Russia
- People were ordered to leave on very short notice: **0.5 hour to days**
- Everyone capable needed to walk
- Transport was reserved for the belongings and the invalids
- Behind the new border, people were gathered in temporary camps: food, animal feed and basic supplies were provided





LOGISTIC CHOICES

- Most travelled by foot
- Horses pulled the heavy belongings
- Cattle was steered on the roads, loose or tied to the horses
- From collection points, people where moved onwards in cattle trains
- Lots of animals were left behind (mainly sheeps, bulls, and pigs because they were not used to walk in snow)





AFTERMATH: RELOCATION AND HERITAGE

- The evacuation is considered by historians as calm and successful
- Nobody was left unintentionally behind
- The people were distributed to all over Finland based on the place of origin – important factor is family or friend help
- Viipuri residents ended up in Helsinki
- Significant fraction of personal belongings was misplaced, but lives were saved



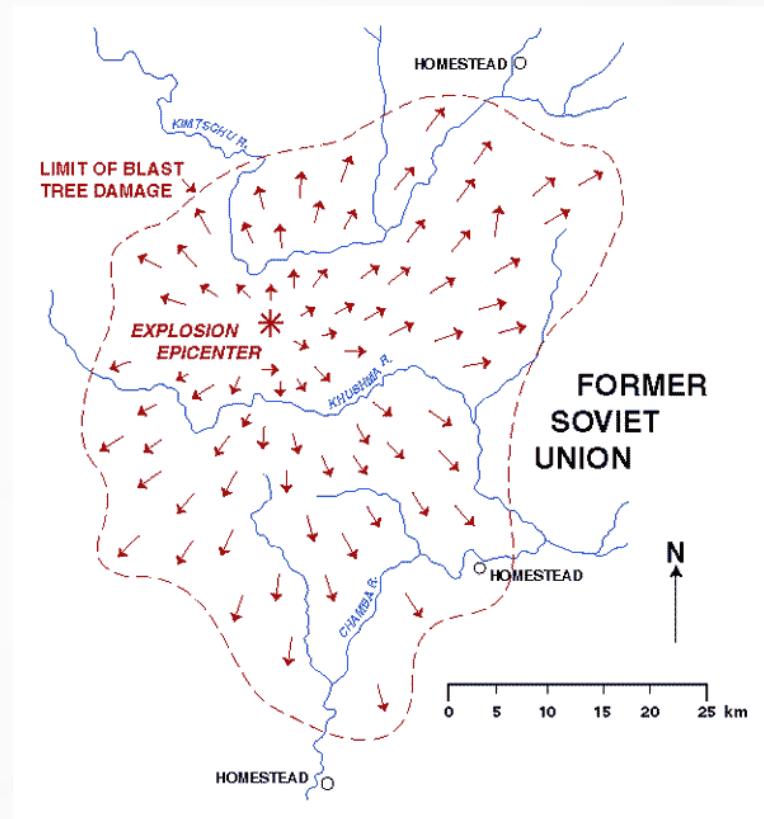


COMPARISON TO ASTEROID IMPACT SCENARIO

Viipuri



Tunguska





LESSONS FOR FUTURE RAPID EVACUATIONS

- When evacuation is done on short notice consider light traffic (walking, biking, skiing)
- Traffic jams and exceeded capacity of public transport are to be expected
- Train, if available, may be more reliable than road traffic, even though the comfort may be limited (limited availability of passenger rolling stock)
- A healthy person can cover tens of kilometers in a single day by walking / skiing or over 100 km by bicycle – **enough to leave Tunguska dead zone in one day!**



7th IAA Planetary Defense Conference

26-30 April 2021, Online Event

Hosted by UNOOSA in collaboration with ESA



Q&A

Session 10b: Disaster Management



7th IAA Planetary Defense Conference

26-30 April 2021, Online Event

Hosted by UNOOSA in collaboration with ESA



End of Day 4

Thank you

