Empowering Rural India with SERVIS

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Abstract

On May 11/2000 India became a billionnaire. Its population reached one billion with approximately 341 million (32%) in the school age group 0-14 years . The estmate for the population for 2004 is: 1,065,070,607 with approximately 341 million (32%) in the age

group 0-14 years . Approximately 746 million (70 %) of the total population is in the rural regions of India where they have been inadvertently, deprived, marginalised for generations and remain 'powerless' embedded in the cultural mores of India.

Working with the assumption that 70 % of the age group (0-14 years) is a part of the Rural Indian Population that places approx. 239 million of this age group in Rural India .

How does one energise the vast "human Capital " of this age group scattered in the villages of India?

How does one "prepare them" so that they can work on "par " with the rest of the population in the same age group in the urban settings to build an industrially strong and environmentally conscious Nation with robust democratic values?

We propose the establishment of a voluntary organisation SERVIS that seeks to activate the dormant spirit of "Service to the Nation" (Desh Seva) among dedicated academics and professionals in all fields of knowledge to energise and activate the dormant potential of the school age children in Rural India.

We envision SERVIS volunteers taking part in Science/Technology Out Reach Initiative (STORI) camps in rural villages. The volunteers will act as facilitators where they will help the students to look at the world in order to look after it (and themselves!) better. The focus will be on stimulating a child's curiosity and engaging them in tasks and activities to develop/ enhance their understanding or ways of thinking about the world and themselves.

Introduction

President of India, Dr. Abdul Kalam, in his 2004 Republic day speech suggested that

"Our scientists should become civic scientists and contribute towards societal transformation. Civic means concerning or affecting the community or the people. In the new capacity, scientists step beyond their campuses, laboratories, ministries and institutes and move into the center of their communities to engage in active dialogue and action with their fellow citizens.

They should ask themselves a question, how their knowledge can make an impact on the common man's life. Our civil servants and others in the service sector should become fear-

lessly people-friendly, have a positive attitude, and provide responsive, proactive, transparent and unbiased administration and service to the billion people...."

We applaud President Kalam's appeal to the scientists/civil servants to move in to the communities and share their knowledge and establish rapport with the soul of India that toils in the villages. SERVIS is poised to inaugurate this movement.

Our proposal

On November 26, 2002 H.E. Mr. V.K. Nambiar, Permanent Representative of India to the United Nations, following his contribution to the " Outcome of the International Year of Volunteers and its Follow-Up" observed that: 'Volunteerism' has formed an integral part of the Indian ethos - known as "shramdaan"in Indian society ..." This social wealth was sought to be harnessed towards national development through National Service Scheme.

The Theme of SERVIS (Scientists / Engineers / Researchers / Visitors In Schools) is in essence a replacement of "Shramdaan "- (donation of labour) by "Gyandaan" (Sharing Knowledge and Wisdom). The dormant spirit of willingness to volunteer to build a strong India can be catalysed into action with the genuine support of all the "stakeholders" in the nation. After all, from the Ambanis of the Coroprate India to the lowly Zaduwala in the village have at least one thing in common and that is the longing to belong to a nation proud and strong (Mera Bharat Mahan.)

SERVIS seeks to promote the spirit of volunteerism among the academics and other professionals in India and to induce them to participate in a Science/Technology Out Reach Initiative (STORI) Camps in rural villages. SERVIS volunteers will act as a catalyst or facilitator helping school age children to understand natural phenomena and technology with emphasis on the ecology of the environment and the human body. School age children in the village will be encouraged to attend the STORI Camps and engage in fun, interactive group activities - through experimentation, exploring, designing and creating - to learn about the Five Elements (Earth, Water, Fire (Energy), Sky (Environment), Wind (Sustainability) and how these five elements affect their daily life.

These were the five elements (Earth, Water, Fire, Sky, Wind [Kshit, Jul, Pavak, Gagan, Sameera Punch rachit yeh adham Sharira) mentioned in Ramayan as the components that comprised the mortal human form.

The beginning of SERVIS

I conceived the idea of forming SERVIS in May 1997 following my retirement from British Columbia Institute of Tecnology in Vancouver, Canada. Over a period of 10 years, I have visited many elementary schools through out British Columbia and have spoken with over 3000 students. I engaged the students in a range of fun and exciting hands-on clasroom activities, using laboratory demo equipment from British Columbia Institute Of Technology physics department to illustrate / explore concepts of force, momentum, magnetism, inertia, energy, sound, laser light and to emphasize that it is the human endeavour that invents.

Prior to each visit I requested the teachers to pose three questions to their students. One of the question was: what is one question that they will like to ask a Scientist? Below is a sample of some of their responses.These responses were most revealing to me as they reflected, in my

view , the level of curiosity the respondents had about their 'universe'.

1. What is a fiber optic cable? What is the most information that it can carry?
2. Why is the sky blue? What comes first? The chicken or the egg?
3. How much energy does a beam of light have?
4. What is the purpose of life?
5. How do clams make pearls?
6. How fast does my hair grow?
7. When did trees start growing?
8. When does earth end (going in to space)
9. How fast does light travel?
10. How do you make nuclear energy?
11. How far does light travel until it loses light?
12. How fast is the speed of light?
13. What is the speed of sound? How is sound made? Why does sound don't make sound?
14. How can sound vibrate?
15. How do snowflakes make their shape and size?
16. How was the earth made?
17. How does salt lower the freezing point?
18. How do cell phones work?
19. What is the most inventive technology on earth?
20. How was science or technology made?
21. How were the galaxies made?
22. Why do planets orbit?
23. How many earths can fit in all of the planets?

I was also delighted with the positive responses I received following the demonstrations/ presentations. Here is a sample of a set of responses from the students and their teacher.

E-mail from Mrs Hehn, Sir James Douglas Elementary School, Victoria BC dated March 30 / 2001

To Amarnath Kshatriya, Thank you so much for coming to our school and giving science demonstrations to all of our classes. You gave so much teaching time to usas well as spending all that time setting up the classroom with the equipment that the children certainly enjoyed. All the teachers raved about what anexcellent experience it was for their students. My grade 6/7 class certainly enjoyed the experience and we talked a lot about it.....

P.S. I didn't censor the student's writing; I let them use their overly,

friendly, casual style.

Dr. K.

Thanks so much for giving Mrs.Hehn's 2nd class and many other classes the time to show

us the science experiments. I think the most interesting thing was the red laser light. I also really liked the paper you put to hold the water in the tube.

-Courtney

Dear Dr. K,

Wassssssssup??? I thought the science lesson was awesome!!! I liked the lazer pointer with the comb the best; it was so cool how it made a noise when you put the comb through! Where did you learn that? Where did you grow up? What school did you go to? That sound wave thing was pretty cool as well... you should have put it to the max level and it would have hurt our ears. That would have been really funny. Are you ever going to come back to SJD? I definitely think you should and teach us something every week. I am really interested in science and I thought your little show was AWESOME! You should come again. Peace-Out Doctor K.

From your biggest fan Eliot.

Dear Dr. K.

Thanks very much for your presentation that you did for us. It was really cool especially with that light/ laser and that sound wave detector(?) that you used. I found it really interesting and I hope you come out and show us again. Thanks again,

Shohei

Dear Dr. Kshatriya,

Thank you for the presentation you did for our class. I really enjoyed it, and I think all of the other students liked it too. I think the sound vibration prongs were really neat, especially the one that sounded like a mosquito. I also liked how the paper held the water in the tube. My favourite was the red laser light experiment. It was really cool!!! Thanks again!

Eric

The impetus to form SERVIS, was a direct result of the stimulating experience of interacting with the young minds and the realisation that curiosity is nature's gift to the yougsters to help them expand and build their conscious mind. Unfortunately that very invaluable gift of curiosty is rapidly stifled in the Indian home environment and eventually school education (rote learning driven by tuitions, no culture of children asking question of elders, etc.) almost extinguishes the level of curiosity. I know that curiosity can be re-kindled. An enabling learning environment can be a 'nursery' for re-kindling curiosity among the school age children.

In concert with the eight sub themes suggested for discussion at this conference, it is clear to us that there is an urgent need to create an enduring culture of interest in science and technology which focuses on education and training for sustainable development among school-age students at the village level and beyond.

SERVIS can meet this need. SERVIS volunteers will set out to create an excitement about science and technology by making it relevant to the childrens' daily lives.

This implies the use of hands-on, fun, yet informative activities, not requiring expensive equipment, to discover/explore elements of:

I. **Life Sciences** - Characteristics of living things: different habitat of plants & animals; exploring the human body Nose to Toes; topics in human health, personal hygiene, diseases, drugs, population , ..

II. **Physical Science** - Properties of objects and materials: explore concepts of measurement, matter, volume, temperature, time, force, magnetisim, power (energy); mechanical concepts; making things e.g. create a simple machine to harness theenergy of the wind.

III. **Earth Science** - Elements of weather, the atmosphere (pollution), food production, sustainability , irrigation , water table , Rivers and canals , evaporation , ..,..

IV. **Technology** - Computer , how it may be used, ...

STORI Camp facilitators will not adopt the role of traditional teachers but will act as model/mentors/facilitators of learning to help the youngsters develop questions, communicate it and seek guidance from the facilitators.

STORI camps will not replace the traditional schools in the village, such as they are, but will act as a parallel modality for nurturing curiosity, imparting skills of comprehension, interpretation of assimilated knowledge and analysing and synthesizing the information presented to them, albeit, at an elementary level.

As the SERVIS program grows and begins to sustain itself, new programs may be added and SERVIS can be expanded to include SERVIS Science Mentors, Ask-A-Scientist, etc.

Volunteering to make the MDG goals a reality

Volunteering is increasingly seen as an effective tool of social transformation in India. Without sthe involvement of the ordinary citizens and the dedication of volunteers, the intended social transformations that we are seeking to institute at this conference will be more dormant than enduring.

I understand that over the past 15 years there has been a prolific growth of Volunteer NGOs in this country and quite a few are doing good work. SERVIS will aggressively seek to connect with those that are truly dedicated and willing to join hands to accelerate the empowering of the Rural India.

The Indian coporate sector is also contributing. As an example, Wipro and Intel have jointly launched, i-shiksha, a low-cost solution and technology to meet the needs of education segment in India.

The i-shiksha is a network of computers that is preloaded with learning and assessment software that enriches the learning experience in an interactive learning classroom environment.

Also "e-choupal", the unique web based initiative of ITC's International Business Division, offers the farmers of India all the information, products and services they need to enhance farm productivity. Farmers can access latest local and global weather information, scientific farming practices as well as market prices at the village itself through the web portal.

I am optimistic that we will be able to entice well-established and reputable scientists, engineers, researchers, physicians, social scientistis, educators, entrepreneurs, etc, to lend their support to the SERVIS initiative. And that the corporate sector and high tech companies will be prepared to invest in the required start-up funding to support the implementation of the SERVIS proposal (administrative support, purchasing, storing, maintenance and repair of demonstration equipment).

I believe we will also be able to count on Indian colleges and Universities' support. This will be needed to provide access to expert faculty, required demonstration equipment and advice on the best way to engage the students in learning about and using ICT. All those departments in the various government levels in India with the responsibility of Human Resource Development, Literacy, Rural Development, etc. can count on SERVIS STORI CAMPS to ensure that **the benefits of various schemes will reach the intended "grassroots level and do not remain only on paper",

**a comment made by the former Union Minister for Human Resource, Dr. Murali Manohar Joshi, during a "Conference on Convergence of Social Sector Programmes for Population Stabilization",held in Delhi in 2001.

Summary:

Early this September 2005, the gathering of the World leaders at the UN treaffirmed its commitment to the MDG'S "to substantially reduce poverty, hunger and ill-health for the world's poorest citizens by 2015."

On Sept. 26 / 05, Kemal Dervis, head of the United Nations Development Program (UNDP), addressing a World Bank conference in Washington DC, commented that "deployment of resources itself will not solve the problem of poverty ". Adding that a new emphasis in development focuses on national efforts to achieve political and social freedoms. MDG's have been a "tremendous outreach effort" and have "energized" the world on giving attention to development issues.

SERVIS is ready to launch the next step of "outreach" to activate the volunteer spirit of dedicated professionals to help build Rural India. SERVIS has the formula for success in accomplishing its mission given:

a) It is an organisation of people in the nation who are dedicated to the cause of empowerment of rural India and are willing to contribute their "Gyan Daan " to do that;
b) It is a free assembly of people each of whom is prepared to share his / her best to build up the potential at the grassroots level and help build a strong, caring and compassionate Nation with robust democratic values. Each participant can feel good about the success of the collective effort.

Table below summarises various phases envisioned to implement the SERVIS project.

Table 1 : SERVIS - PROJECT PHASES

Phase I - Pilot project	- Create SERVIS volunteer database - Conduct a STORI Camp - Monitor/evaluate pilot project outcome
Phase II - Programme Development	- Solicit program sponsors/stakeholders - Solicit active support for program (government sanction, authority to promote/market program to schools, volunteer marketing support, financial support, program implementation support Gather/analyze info on the differing perceptions of Rural and Urban students on science and technology. To serve as a resource for preparing presentations and demonstrations. - Create database of volunteers for SERVIS Speaker's Bureau - Create profiles of SERVICE volunteers to be used as marketing collateral - Secure financial support for program implementation
Phase III - Programme Implementation	- Development of sample units and lesson demonstrations including the full implementation of the Visiting SERVIS Speaker's Bureau and a gradual introduction access to third-party learning resources. - Develop website dedicated to providing marketing information, registration services, Visiting SERVIS Speaker's Bureau requests and links to relevant resources.
Phase IV - New Activities	Full implementation of the Visiting SERVIS Speaker's Bureau and a gradual introduction of new program activities such as SERVIS Science Mentors, Ask-A-Scientist Website, Virtual Field Trips and Student Exchanges and Teacher Workshops.
Phase V - SERVIS Railcar Program	- The goal of this program is to reach communities and schools spread out along India's vast railway system to deliver the highest quality Science and Technology education available in a Visiting SERVIS Speaker's Bureau format.We anticipate the donation and retrofitting of 7 railway cars: (2) Railcars will be retrofitted to contain a modern and technology-enabled classroom-on-wheels which will illustrate how ICT access and e-governance can be used (4) railcars, each being sponsored by a multi national corporations / local high tech performers, will be used to exhibit the latest in science technology relating to the Four Elements: Earth, Water, Energy and Environment; the seventh railcar will be retrofitted to include sleeping ccommodation for 6 SERVIS staff/volunteers, kitchen and eating facilities, bathing facilities, office and storage.

SERVIS - BOARD MEMBERS

SERVIS (Scientists, Engineers, and Researchers Visitors in Schools) was conceived in 1997 by Amarnath Kshatriya and Peter Donkers. SERVIS is a non-profit, volunteer-based organization.

The mission of SERVIS is "to foster scientific and technological literacy among school-age learners, enabling the growth of a critical mass, who will be dedicated to building and sustaining caring and compassionate communities".

AMARNATH KSHATRIYA – Founding Director

M.Sc., M.Ed Univ. of British Columbia, Canada

C.P.G.S (metallurgy) Univ. Cambridge U.K

Teaching experience total 44 years of which 6 years were in Mumbai Colleges and 38 years in Canada- 33 years as a physics faculty of British Columbia Institute of Technology, Burnaby British Columbia.

Sabbaticals: one year in dept. Medical ultrsound as a Visiting Scientist, M.I.T Cambridge, Mass. USA.: Three months, Assoc. Professor, physics Dept. Univ. Nebraska, Lincoln Nebraska, USA

Ten years a Volunteer Visiting Scientist in Elem schools in BC (1994-2004)

Council Member: Inter American Conferences on Physics Education (1987-2000)

Distinguished Service Award by the Board of Governors of BCIT

on June 20 / 2003 for (" outstanding and sustained service to BCIT ,.)

PETER DONKERS – Associate Director

Peter Donkers has more than 20 years of K-16 education experience in Canada and the United States. Peter holds undergraduate and graduate degrees in education and has taught in elementary, middle and high school programs.

Peter has served as a consultant to IBM, Industry Canada and to governments and institutions in Mexico, Argentina, India and the Caribbean. Peter is currently the executive Director of Campus Canada.

BARRY CARBOL, Ph.D. M.Ed. – Board Member

Dr. Carbol is an experienced educator having spent over 25 years in various capacities in public and private education. He has taught at all levels of the system from elementary through graduate school, been an administrator, and has an extensive background in curriculum and instructional design, learning resources, educational implementation, measurement and assessment, and educational technology.

Barry has performed as the Chief Operating Officer of the Open Learning Agency with responsibility for the Open School. Among his academic credentials, Dr. Carbol holds a Ph.D. in educational psychology from the University of Alberta and an M.Ed. in Curriculum and Instruction from the University of Oregon.

GUY AKINS, B.Sc., B.A., P.Eng – Board Member

Mr Akins has 38 years experience in the civil engineering aspects of power and water resource projects worldwide. He has worked in 15 different countries including Canada, USA, England, Switzerland, Thailand, Vietnam, China, India, Nigeria, Australia, Japan, Russia, Peru, Brasil, and Argentina.

For the past 10 years he has been responsible for a team of engineers and financial experts assisting clients on private power projects for example:

- Identify and develop business opportunities for the Power and Transportation Division worldwide. Focus on Latin America and Asia.
- Project Manager for 600MW Porce Hydropower Project in Colombia
- Assistant Project Manager for 300MW Dai Ninh Hydropower Project in Vietnam
- Project Manager for 800MW final phase Kol Dam Hydropower Project in India

Project Manager for 300MW final phase Asahan Project in Indonesia

ANUJ SINGH, B.SC. Dip.Tech BCIT ---- Associate Director SERVIS India (Mumbai)

Anuj Singh completed B. Sc in Chemistry from the Univ. of Bombay and a Diploma in Chemical and metallurgical Technology at the British Columbia Institute of Technology, BC Canada.

He returned to Mumbai in 1976 after completing two years at BCIT. He joined Associated Cement Companies Ltd. (ACC Ltd) in 1977 in their Research and development department in Mumbai. He is currently a manager in R&D at ACC Ltd

MR. M. MONI, Deputy Director General National Informatics Center Govt. of India: Director SERVIS -INDIA

Mr. Madaswamy Moni is a senior technocrat of National Informatics Centre With more than 24 years of professional experience, he has held several prestigious assignments, including sharing important responsibilities as Principal Systems Analyst to the Former Finance Minister of India during 1985-88.

He pioneered to establish the District Information System of National Informatics Centre (DISNIC) in 27 Sectors of importance, which included Agriculture, Education, Industries, Rural Development, Microlevel Planning, Animal Husbandry, Fisheries, Water Resources etc, for implementation in about 520 districts of India, with the establishment of NICNET in districts, during 1987-96.

His forte is ICT Diffusion and Infusion for achieving sustainable agricultural and rural development in India. He is a distinguished Board Member (Indian Representative) in the "Asian Federation of Information Technology in Agriculture" (AFITA) for 2002-2004 and now the Vice-President of AFITA for the Period 2004-06, and also the Vice-President of Indian Association of Information Technology in Agriculture (IAITA).

January 2004. Recipient of "Seva Ratna " for his contributions in extending the applications of Information and Communications Technology to agriculture and rural development in India, in

The Centenarian Trust (Chennai) has conferred Madaswamy Moni with the title "Seva Ratna" for his contributions in extending the applications of Information and Communications Technology to agriculture and rural development in India, in

STORI

Science / Technology / Out Reach / Initiative

1.Who will be a Sponsor?

Sponsor may be a government agency, a corporation, a philanthropic association, group of individuals/ Government Departments - Education/Rural development / MHRD/ ..

2. How will the Mission of STORI be accomplished ?

By way of two week STORI CAMPS IN RURAL AREAS, where the volunteers wll act as facilitators:

a) Encourage and sustain curiosity among the learners and teachers;

b) Encourage class participation, promote and reward discussions / learning made relevant to the 'real world ';

c) More 'Why' and 'How' in the Class room;

d) Teachers as Facilitators in Learning ;

e) Develop a scientific approach to learning (by way of selecting / doing projects in the real world outside the class room, communicating their results to the class / learning to look at all sides of an argument , ../)

3. Who will be the SERVIS Volunteers?

Volunteers in the community who are dedicated teachers and researchers , Volunteers from outside the community who are dedicated teachers and are willing to act as "pollinators"

We all get together for a week or so (Workshop with the teachers and share our best practices among one another , following that and in response to a school/ village head / a local resident in the village etc. request Volunteers go to a school and try out .

4. What are the required resources?

a) Equipment needed for demonstrating the concept and technical application;

b) equipment for projects / audio visual aides / tapes etc/ computer access ;

c) off site resources may act as web contacts / science technology development communicators /

d) Logistics of getting the volunteers to the STORI CAMP , accommodation, board , best times for visit, ..,..,

4. What will be my role? (or for that matter that of any of the Board Members / Directors ..

a) To establish an association of local dedicated researchers / educators who subscribe to the mission of STORI.

b) Following that a one week workshop is conducted where the local volunteers along with school teachers get together and identify concepts that are difficult to teach / get the students interested in / ..In the work shop we all share our best practices to engage students' interest/ an inventory of equipment we will need along with appliances etc which clearly demonstrate the technology in action

/ principles of science underlying / How the computer can entice the students and help the teacher to act as a facilitator / ..

c) contact person dealing with questions / resource material via internet. I expect to visit the Pilot project site once a year for 4 weeks.

5. Monetary requirements :

a) An honorarium to the local community volunteers who go to a school on per diem

b) cost of room/board for the week long conference for all participants Cost of developing relevant equiment / etc ..from local Corporations / Processing Feedback.

6. Evaluation of the project :

SERVIS BOARD MEMBER, STUDENTS, EDUCATION DEPT./ SPONSOR OF THE PROJECT.