



Agastya: Improving Critical Thinking and Leadership Skills

This non-profit brings innovative science education to the doorsteps of students in rural India to increase the quality and impact of learning



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Summary

Many of India's disadvantaged youth are apathetic about their education from the formal schooling system, resulting in high dropout rates. A low percentage of children who graduate from schools enter college, and those who do often do not understand core concepts in many subjects. Moreover, a majority of the 15 million youth who enter the workforce every year in India lack employable skills and thus decrease overall productivity.

Lack of interest and perceived value of education often cause low retention and dismal learning outcomes, which can perpetuate poverty and contribute to the socio-economic divide. Developing students' problem-solving, analytical and creative thinking skills through dynamic education could motivate and empower them.

In India, however, creative learning is a privilege of the rich few. To remedy this situation, Agastya operates a hands-on science education program, equipping disadvantaged students of government schools in rural areas with tools and learning that foster confidence, creativity, teamwork and leadership. Their model is embedded in the existing formal education system; it has based its products on the government syllabi to remain relevant and complement the school curricula. Agastya involves all critical stakeholders in education—children, teachers, parents, community and government.

Agastya's learning methods take the form of activity—project and demo-based learning, peer-to-peer learning and learning from nature. Agastya uses a variety of delivery channels: science centers serve as a hub for activities in a region, teacher trainings, science fairs and summer camps; mobile science labs and lab-in-a-box programs deliver education to students' doorsteps and classrooms; government schoolteachers receive training in creative learning methods; and selected students obtain additional education on scientific concepts to become peer instructors.

To date, Agastya reports an outreach of more than eight million children and 200,000 teachers in 18 states across India. Independent third-party assessments show positive changes in students' attitudes toward science, increased concept retention and development, and improvement in overall performance under the model. Agastya aims to reach 20 million children and one million teachers by 2020.

Agastya's top-down approach has helped break systemic government inertia and their high community engagement has received buy-in from rural communities. Factors to address moving forward with regards to scale-up and sustainability include the narrow base of donors, inadequate staffing, teacher apathy and a limited monitoring and evaluation system. As the project moves on, it is in various stages of implementing diverse pilots geared toward ensuring maximum reach to the bottom-of-the-pyramid population in a cost-efficient manner.

Challenge

India Education Policy

Since 2000, India has stepped up its efforts to provide basic education services to all. In 2000–01, the government launched the Sarva Shiksha Abhiyan, one of the world's largest and most sustained initiatives in elementary education. Encouraged by the results, the government launched the Rashtriya Madhyamik Shiksha Abhiyan in 2009 to universalize secondary education and improve its quality.

In a significant move, the government passed the Right to Education Act in 2009, which made free and compulsory education a right for children 6–14 years old, and providing this education a moral obligation for the State. Over the years, this has led to an increase in enrollments and improvements in school infrastructure across rural India.

Learning Methods and Outcomes

Despite these measures, the level of learning achievement among children remains a major concern. ASER (Annual Status of Education Reports) maintains that learning outcomes, especially in government schools in most states, are still poor (Figure 1).

The Constitution of India has incorporated the pivotal idea that “diffusion of scientific temper” [a process of thinking that involves the scientific method and application of logic] among the uneducated masses was the answer to the challenge of broad-based development. However, the schooling system has done very little to induce creative thinking and problem-solving abilities among large numbers of students in government and rural schools. Student teacher participation in experiential learning is limited by infrastructure, teaching facilities and aids.

India's education system is traditional, with rote-based, didactic learning that is devoid of practical application. Government teachers are not trained in creative learning methods and instead measure student performance on the 3Rs of education (Reading, Writing, Arithmetic). Attempts have been made to instill activity-based learning concepts into the curriculum, but sustained initiatives for instilling creative thinking and leadership skills in education are not uniformly and routinely followed.

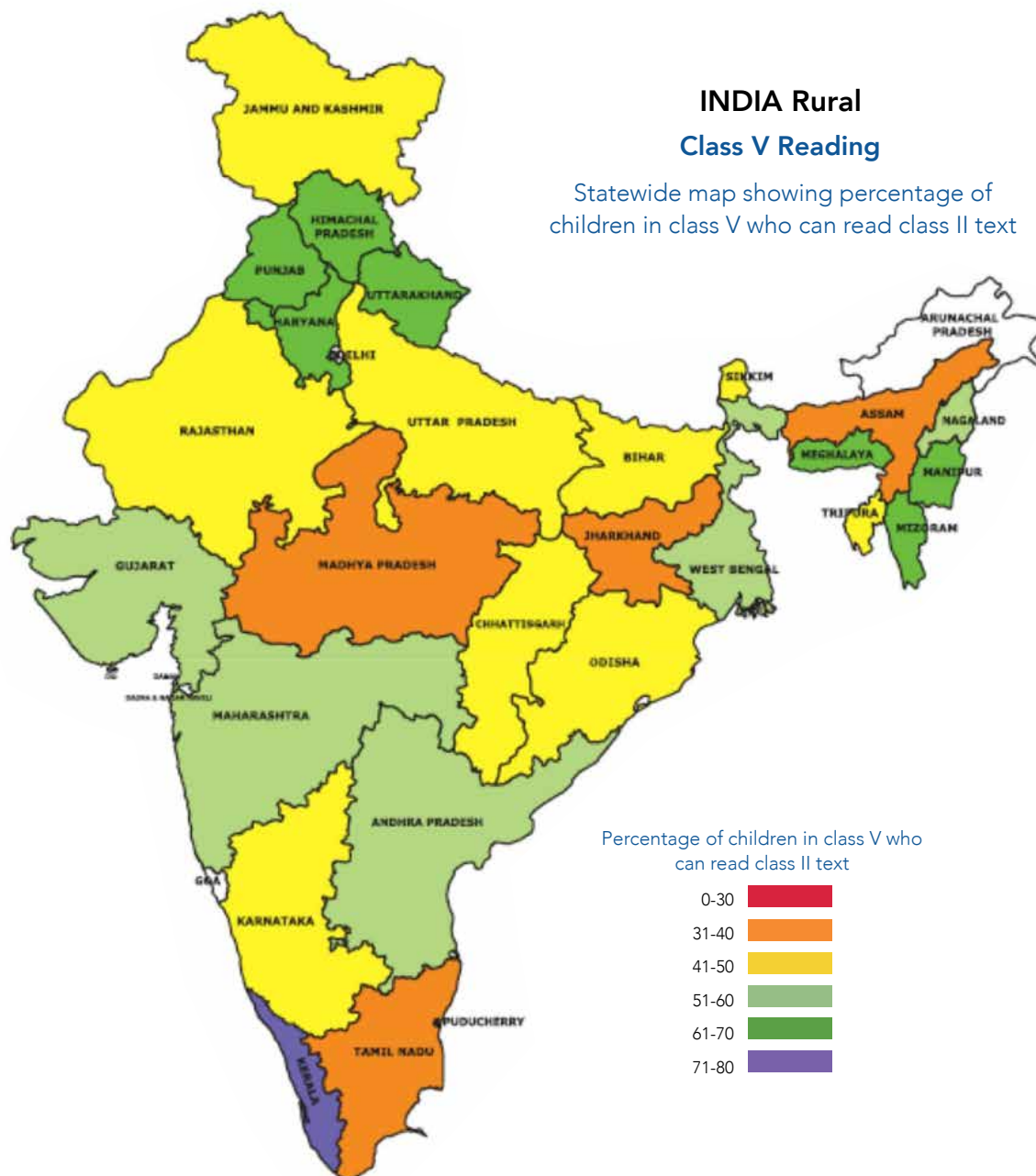
Since creative learning is an expensive proposition, only a small number of students in elite urban schools are presently able to benefit from it. Some private schools employ creative, activity-based learning methods, but the cost is prohibitive.

Non-state players have also primarily based their interventions on providing access to the 3Rs. Learning outcomes are mostly measured by the students' performance on these three components. Therefore, interventions revolve around delivering these parameters, resulting in few interventions focusing on other aspects of creative learning.

Effect on Economy and Social Structure

The Constitution of India envisioned that by instilling the spirit of enquiry and disseminating problem-solving, cause-effect, and creative thinking skills through education, poor communities across India would rise to meet their social and economic challenges and create a prosperous nation.

Figure 1. ASER 2013 Report on Reading Abilities of Class V Students



Without access to creative learning methodologies, poor communities in India suffer from low absorption capacity and thus have sustained low and sub-optimal development. Despite the high overall enrollment rate for primary education among rural children of age 10, half cannot read at a basic level, over 60 percent are unable to do division and half dropped out by the age of 14 in 2008 (The Economist, 2008).

Seeing little value or interest from their children in education, rural and disadvantaged parents prefer to send their children to work. Low learning outcomes among youth can also lead to an increase in crime. These poor learning outcomes and overall apathy toward education can lead to a perpetuation of poverty, contributing to the socio-economic divide in India.

Innovation

Agastya

Under the leadership of Mr. Ramji Raghavan, Agastya International Foundation was established in 1999 as a non-profit educational trust to spark curiosity and nurture creativity and leadership among economically disadvantaged children and teachers, particularly in rural India. The idea of Agastya was conceived by a group of scientists, educators and executives who believed that instituting curiosity among children is the key to translate learning into goals.

Agastya envisions an India of “creators, tinkerers and solution-seekers that are humane, anchored and connected.” It aims to propagate a creative temper among disadvantaged and vulnerable children and teachers, through hands-on, experiential learning; teacher education; and scalable, sustainable and environment-friendly methods.

Toward this, Agastya derived inspiration from the Constitution of India’s ideas on diffusion of scientific temper. In addition, Agastya’s approach of experiential learning drew from the learning pyramid described in “How the Brain Learns,” which says that students retain five percent of a lecture, 10 percent of what they read, 50 percent of a discussion, 75 percent of what is personally experienced and 90 percent of what one teaches to others (Sousa, 2011).

Transforming Students from Passive into Active Learners

Agastya offers disadvantaged children in rural India access to dynamic, hands-on, science-based education by disseminating innovative learning tools and training government school-teachers in creative learning methods. By inspiring students with creative learning in a cost-effective way, Agastya believes their program will contribute to the productivity and prosperity of individuals, and in turn, country.

The program targets disadvantaged students ages 6–18 in classes V to X in government schools across rural India. Parents of these students are often small marginal farmers, carpenters, stone cutters, construction workers or menial white-collar workers.

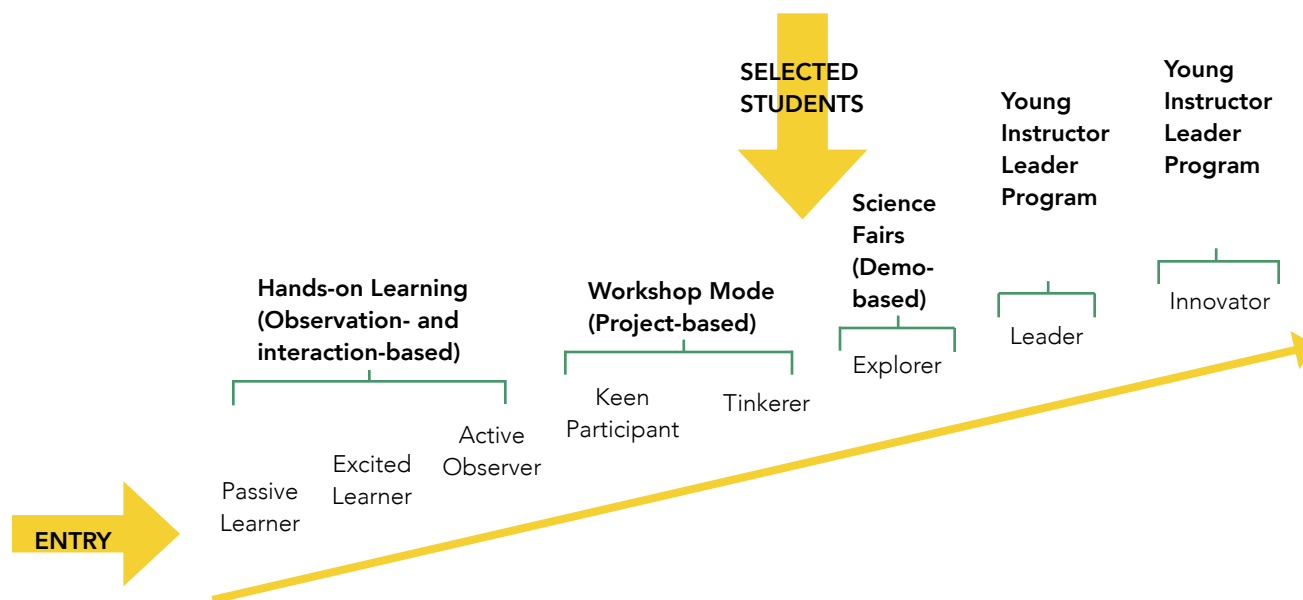
Students entering the Agastya system go through step-wise learning methodologies to transform them from passive learners to leaders capable of initiating change in their immediate communities, leading to sustainable development (Figure 2). Since government schools have set syllabi that cannot be disrupted, Agastya has developed its learning tools based on the National Council of Educational Research and Training (NCERT) prescribed curriculum in India.

Learning methods take the form of the following:

- Hands-on learning for the entry-level student, to emphasize observation, interaction with the instructor and questions;
- Project-based learning to encourage deep discussions and promote critical and analytical thinking;
- Demo-based learning to demonstrate scientific phenomena through simple models;
- Peer-to-peer learning to boost confidence and improve the communication skills of young student leaders; and
- Problem-solving-to find solutions for real-life problems that plague their villages for experiential learning.

Learning is carried out through innovative service delivery channels, such as science centers for resource and training hubs and mobile science labs that visit village schools and

Figure 2. Stages to Transform Students from Passive Learners to Leaders



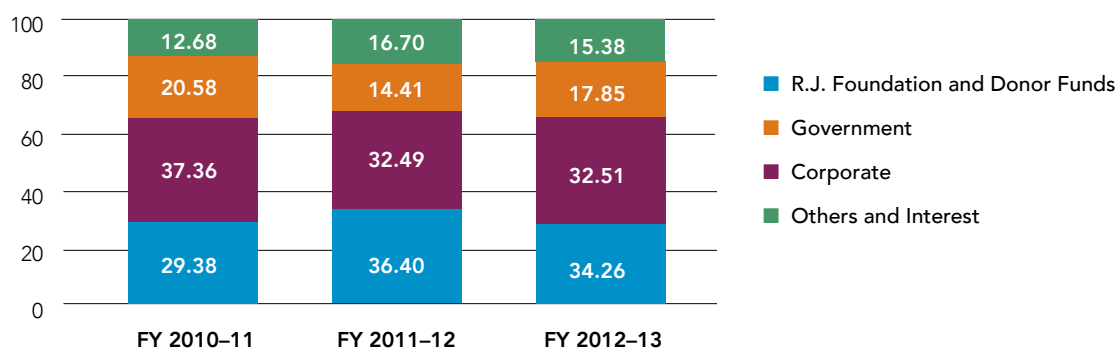
urban disadvantaged areas. In addition, lab-in-a-box sets are circulated among classrooms to conduct hands-on, follow-up programs. These delivery channels are detailed in the next section and an implementation map is available in Appendix IV. A Young Instructor Leader program recruits and educates selected students to become peer instructors and develop leadership and communications skills.

Financing

Agastya's model uses a mix of private and public financial resources—grants are received from state governments, private philanthropic foundations, corporations and individuals. The annual budget was USD 1.67 million in FY 2011–12 and USD 1.82 million in FY 2012–13 (Figure 3). The budget increased in the last two years to USD 3.72 million in FY 2014 and USD 4.04 million in FY 2015.

In 1999, the Andhra Pradesh government allotted land in the town of Kuppam to build a Creativity Lab. Personal financing by Mr. Ramji Raghavan and two non-resident Indians from London supported the operating costs. In 2000, the Oberoi Family Foundation gave a significant grant to Agastya. In 2003, Rakesh Jhunjhunwala Foundation started to provide funding. In 2003–07, agreements were made with the governments of Andhra Pradesh and Karnataka for

Figure 3. Key Sources of Funding



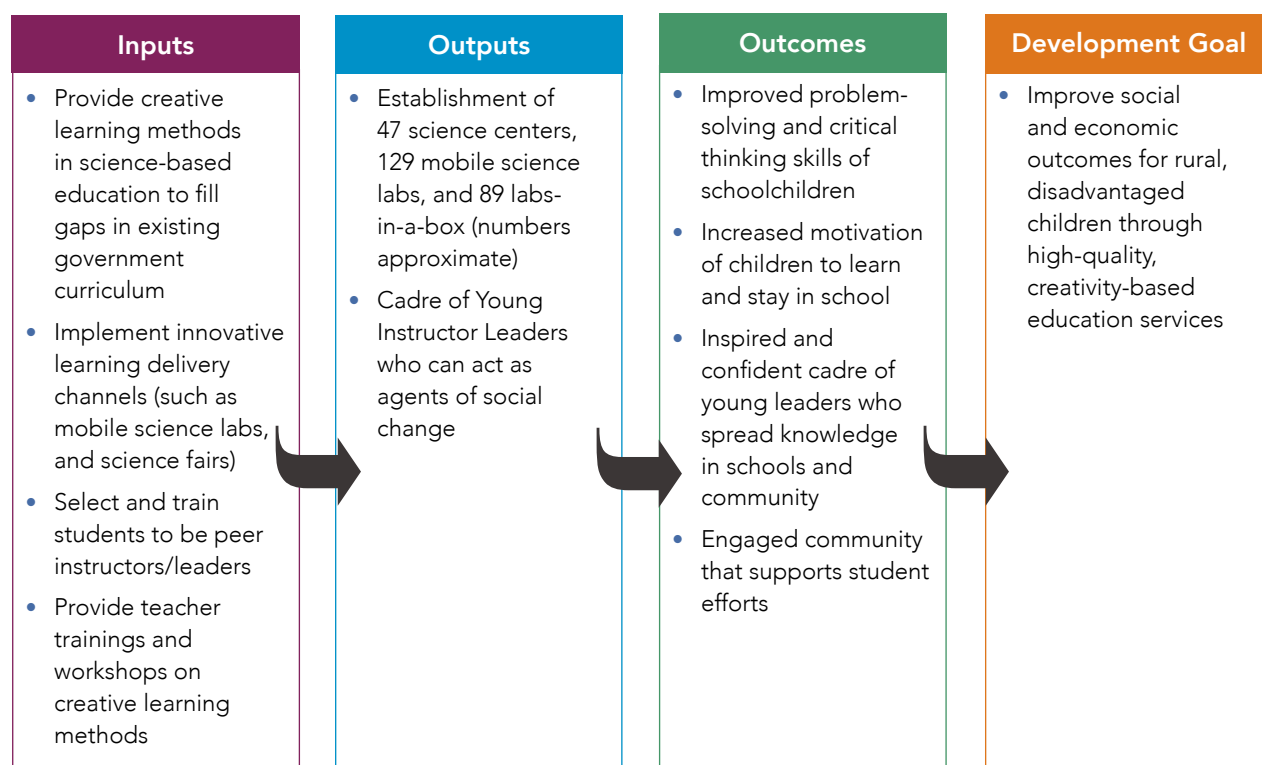
funding. In 2006, Synopsys entered as a corporate funder. Starting in 2010, the state governments and Rakesh Jhunjhunwala Foundation emerged as Agastya's key funders, contributing on average 36 percent and 41 percent respectively of total funds received.

The grants support either capital expenses (science centers, equipment, mobile vans, instruments, etc.) or operating expenses (salaries, rentals, research & development, promotional expenses, etc.) depending on the nature of the agreement. The government of Karnataka, for example, supports both capital and operational expenses for setting up an integrated ecosystem model in the state.

See Appendix V for expenditures for flagship delivery channels. All projects costs are measured and monitored on the basis of program budgets. The accounting system tracks expenses on a cost accounting basis. Agastya developed a structured approval process that is followed at the point of expenditure. They conduct regular monthly reviews to assess variances in project expenses. Agastya reports a general and administration budget of less than 10 percent with project costs supported by grants.

Results Chain

Figure 4. Results Chain for Agastya Model

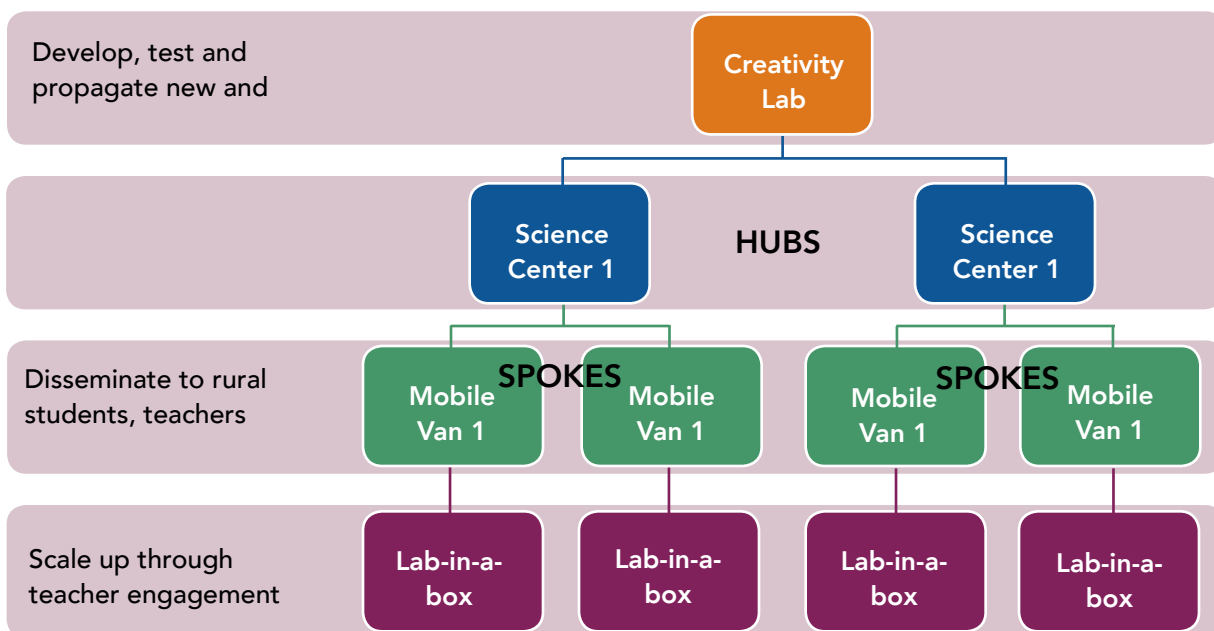


Implementation

Flagship Delivery Channels

Agastya employs varied channels to deliver their education services directly to their targeted groups (Figure 5).

Figure 5. Overview of Delivery Channels



Creativity Lab, in Andhra Pradesh (HUB)

In 2000, Agastya set up a Creativity Lab in Kuppam, a town in Andhra Pradesh. The Creativity Lab, a research and development center for Agastya, is an “idea factory” dedicated to developing content and tools for experiential learning. The lab also serves as a platform to train Agastya instructors and impart training to government schoolteachers. Since 2010, it has evolved into an ecology lab where nature-based experiments are conducted on campus. Agastya disseminates the learning through its outreach channels.

Science Centers (HUB)

Agastya believed government schoolteachers and children should visit fixed resource centers more often since they can facilitate deeper inquiry and learning. They house many more experiments than the mobile science labs. As such, in 2006, with support from USAID for a project in North Karnataka, Agastya expanded its dissemination with fixed science centers as the hubs of activities in a particular region, with centers supported by mobile science labs and the lab-in-a-box program as the spokes.

Science centers house special training activities, science fairs, summer camps and Young Instructor Leader programs. The centers accommodate multiple experiments in science, math, ecology and astronomy. Agastya has set up 46 science centers in various districts across India, as well as core science activity centers to provide many features and benefits of its Creativity Campus. They also serve as a resource center for the science centers in a region.

Mobile Science Labs (SPOKE)

Agastya realized that by only getting students to the Creativity Lab, knowledge dissemination would happen at a much slower and limited pace than if the learning was brought directly to the students. To make hands-on education more accessible and disseminate the content created in the Creativity Lab, Agastya started mobile science labs in 2002. Traveling in brightly decorated vans, they reached out to government schools and children in remote locations.

The mobile science lab is equipped with audio-visual aids and experiments. Each van travels to the doorstep of remote schools with more than 200 hands-on science models. The models cover a wide range of topics in physics, chemistry, biology and math for children in classes V through X. The vans also provide teacher training, and community night visits that allow parents, family, and community members to participate in learning sessions as well. To date, Agastya operates 127 mobile science labs.

Lab-in-a-Box (SPOKE)

Rural students and teachers exposed to Agastya's science models—through mobile science labs or visits to science centers—wanted these models to be available for a fixed time period (rotational basis) in their schools to intensify experiential learning. In 2011, Agastya introduced the lab-in-a-box program to facilitate hands-on learning in the school over a period beyond the visit of the mobile science labs visit.

They organized science models and experiments based on pre-designed learning modules and mapped it to the school syllabus by placing them in boxes left with the teacher for approximately one week. Agastya follows a rotation scheme of distribution, whereby the 10 boxes in one set are available to 10 schools for one week in a three-month period. Currently 89 boxes are in circulation.

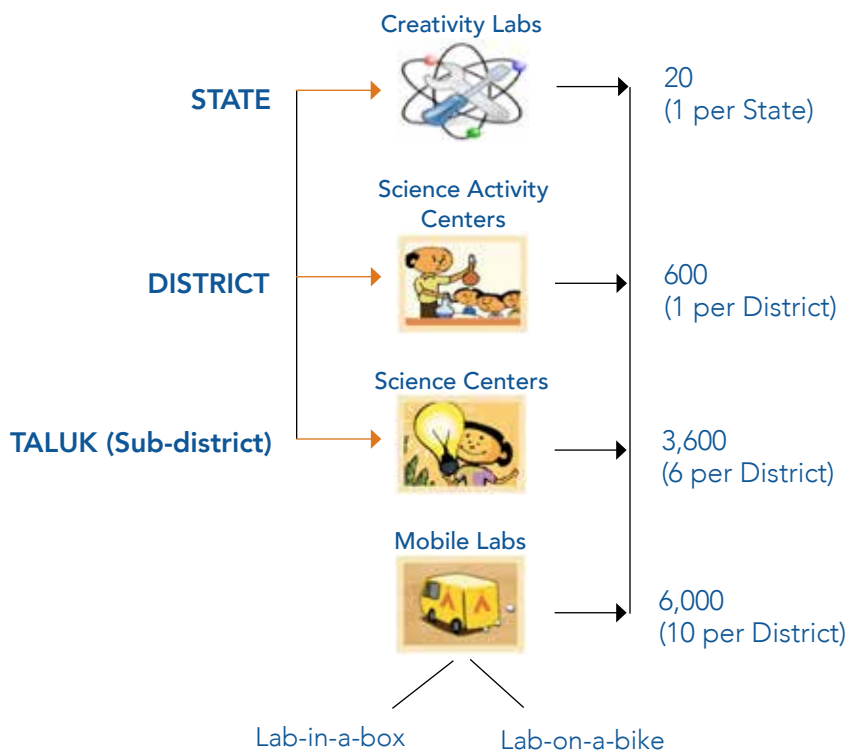
Additional Outreach Methods

Among children, Agastya's science fairs are fairly popular. To reach the maximum number of children, Agastya convened "mega" science fairs that attracted thousands of participants since the first fair took place in Hubli in 2008. Other delivery vehicles are being piloted to assess their feasibility and effectiveness, which include lab-on-a-bike (with the lab fitted to a bike) and Techla bike (with a trained instructor who has a lab-in-a-box and a laptop). Agastya is also piloting an iMobile program on integrated learning through a digital science curriculum.

Scaling Up the Integrated Approach

Agastya promotes an integrated approach that combines various delivery channels. Agastya's delivery model is modular and can be scaled to adapt to available levels of funding. For maximum and effective dissemination in a nationwide scale-up, Agastya recommends one Creativity Lab per state plus one science activity center, six science centers, 10 mobile science labs per district, one lab-in-a-box and one lab-on-a-bike. Figure 6 details the recommended ecosystem.

Figure 6. Recommended Nationwide Scale-up: Ecosystem Approach



Young Instructor Leader Program

Agastya believes concepts and information are better absorbed through peer instructors without the fear of being reproached, thus eliminating the barriers that can exist between an adult instructor and a student. In 2007, Agastya selected a group of students with the help of teachers and provided special training on science models in addition to building their capacity and skills in presentation and communication. The students explained scientific concepts to other children at science fairs.

In 2010, the program evolved into the Young Instructor Leader (YIL) program to encompass experiential learning opportunities that go beyond science education and focus on the holistic development of students. YILs are identified among children who show potential for leadership and a willingness to engage in teaching other children and in conducting innovative community projects with potential benefits to society (such as nature conservation, water issues, etc.). Each YIL is tasked with training five young instructors for the Agastya mega science fairs.

Agastya recruits students from classes VI–VIII to be YILs either from Agastya science centers/labs or by approaching schools for help. On average, 10–15 percent of students are recruited for the program. Once recruited, the students, teachers and parents receive an orientation. Agastya organizes special training and opportunities for selected students, and they remain in the program until class X. In addition to more exposure to experiential learning in science, math, ecology and art, students study, for example, flora and fauna, nutrition and health, computers and robotics, conversational English, broadcasting, story writing and local industries.

Teacher Education and Volunteer Corps

Government schoolteachers receive training in creative learning methods through regular workshops held at the science centers, attend education refreshers through the mobile science labs, and remain engaged with labs-in-a-box. There is usually a group of 30 teachers for a

minimum two-day workshop. In addition, Agastya has also designed and currently executes four-day, experiential, hands-on science and math training sessions based on the constructivism theory for government schoolteachers of India. This program is gaining momentum.

Currently, Agastya's volunteer program has approximately 280 participants, and consists of:

- Core resource volunteering scientists, educators, entrepreneurs, CEOs, retired government officials and the former President of India, Dr. A.P.J. Abdul Kalam;
- Program volunteers comprising corporate employees and individuals providing technical and other support; and
- Student volunteers in various programs, such as when engineering students mentor schoolchildren.

Training and capacity building is an important building block for Agastya programs to ensure the highest quality content. They created a dedicated team to ensure the training needs of employees are identified and appropriate re-skilling is provided. In 2012, Agastya launched the Instructor Master Trainer (IMT) program for continuous capacity enhancements for instructors engaged in delivery of various programs. The program provides a forum for cross learning through interactive workshops. It is also a platform where persons from the corporate sector who have practical knowledge in science and teaching can engage with the instructors.

Partnerships

With financial and technical support from partners and stakeholders, Agastya has implemented its program across 16 states in India.

Government

State governments are significant partners for Agastya since its programs are run in government schools. This helps provide access to rural schoolchildren for easier implementation of Agastya programs. The government is also a source of financial support.

For example, through funding support from the government of Karnataka, lab-in-a-box was piloted in 150 schools in North Karnataka covering more than 200,000 students. Based on feedback received from the schools, the government requested a scale-up in four districts, followed by a further scale-up across the state. In 2013, the government of Karnataka adopted Agastya's proposal of implementing an ecosystem-based model to ensure reach and efficiency across government schools. In addition, the government of Punjab has provided grants to deploy 22 mobile labs in the state and is working with the government of Haryana.

Going forward, Agastya hopes the central government will recognize Agastya's programs and include them in its national education framework. This will help take Agastya's programs to a wider, national scale and benefit a larger number of disadvantaged children.

Financial Supporters

Most of Agastya's programs are run through financial grants and investments made by individuals and corporate foundations, who become significant partners in the implementation of Agastya's programs. Agastya also receives funding from individuals and corporate foundations.

Community

Agastya undertakes community engagement initiatives to reach out to parents and community members, whose acceptance provides Agastya with a license to operate and enables children to connect with the programs. For example, mobile science labs make nightly community visits that allow the child's parents, family and community members to participate in learning sessions and witness the programs themselves. Traveling mega science fairs allow the communities to become more engaged and supportive of students' presentations.

Knowledge Experts

Agastya's trustees and advisers include educators, teachers, scientists, CEOs, bankers, entrepreneurs and philanthropists with significant knowledge and experience in science-based education, as well as leading and managing Indian and global organizations. This brings academic and technical proficiency into the program as well as helps with networking and lobbying. Leading academic institutions (such as Azim Premji Foundation, London Business School) and scientific institutions (such as Defence Research Development Organisation) provide curriculum and pedagogical inputs.

Agastya also works with other civil society organizations to reach the rural student population through these organizations' existing programs. The partnerships are presently at a nascent stage. Examples include the Akshara Foundation (for a library program), IIMPACT and SELCO Foundation (for ecology programs), and Deshpande Foundation and Nalandaway Foundation (for YIL programs).

Impact

Agastya's model delivers creativity-based education services to a large number of disadvantaged and at-risk children and teachers through innovative service delivery channels. To date, they have reached more than 8 million children and 200,000 teachers in 18 states across India.

Motivated and Empowered Students

The YIL program launched with three students and has grown to more than 6,000 active YILs. In the 2011–12 academic year, 85 percent of YIL alumni were inspired to choose science courses. The same year, two female leaders were selected to be part of the INTEL-IRIS science fair, for their project on growing oxygen on highways.

According to a Ministry of Human Resource Development study conducted on 2,048 children from 256 schools, over 70 percent of students and teachers welcomed Agastya and demanded an increase in interventions. In response, Agastya promoted student concept retention and development and provided professional development for teachers. According to a Best Practices Foundation study of 1,348 children in Karnataka, there was a significant increase in awareness of alternative learning methods, motivation to study science and leaps in curiosity.

Table 1. Summary of Impact from Agastya Initiatives*

An assessment of the Agastya business model based on an analytical framework.

MEASURABLE BENEFITS TO BOTTOM-OF-THE-PYRAMID USERS	
Reach/Access	<ul style="list-style-type: none"> To date, Agastya operates 127 mobile science labs to reach more than one million students. Agastya has set up 46 science centers. Agastya reports that labs-in-a-box can generate up to 30,000 exposures per year, and that these exposures are more intense and immersive in nature for interested students and teachers. Currently 89 labs-in-a-box are in circulation, creating total 572,616 exposures.
Effectiveness	<ul style="list-style-type: none"> Agastya reports that 6,000 graduates from the YIL program have been transformed into agents of social change. 26 YILs have reached the finals of the national-level science award competition; 11 have won awards for five years consecutively. 30 YILs have received scholarships to colleges.
Accountability	<ul style="list-style-type: none"> Robust monitoring and evaluation (M&E) systems and impact assessment studies are needed. To date, the Agastya model assesses its outreach on few parameters, such as number of students reached, number of teachers trained, etc. The result measurement is qualitative and based on informal feedback from teachers, children, parents, and communities. This year onwards Agastya is implementing an M&E tracking framework, jointly developed by the Indian Institute of Management Bangalore (IIMB) and Agastya, to cover areas across its operation. The accounting system tracks expense on a cost center approach to accounting. Agastya has developed a structured approval process that is followed at the point of expenditure. Regular monthly reviews are conducted to assess variances in project expenses.

Cost-effectiveness and Affordability	<ul style="list-style-type: none"> Agastya reports that the mobile vans do approximately 25,000 exposures per year at USD 0.66/exposure (220 days per year). Agastya reports that the science centers do approximately 12,000 exposures per year at USD 1.25/exposure.
Impact on Development Outcomes	<ul style="list-style-type: none"> Given that Agastya's model is aimed at improving learning outcomes among students, it needs to start measuring these and outreach numbers. The outcomes—and any trends monitored over the years—should be captured to build a strong body of evidence and establish a link between its programs and national prosperity. Demonstrating these outcomes will give Agastya a better chance of attracting donor and policy interest. As mentioned in the "Accountability" metric, this year onwards Agastya is implementing a M&E tracking framework, jointly developed by IIMB and Agastya, to cover areas across its operation.
Potential for Sustainability	<ul style="list-style-type: none"> Agastya receives strong support from state governments, communities and implementing partners and stakeholders. Agastya is contemplating setting up a different entity to engage in commercial activities to raise funds beyond a narrow funder base. Agastya is looking at ways to address building up high-quality, field-based staff and teacher development.
Potential for Scalability	<ul style="list-style-type: none"> Agastya's delivery model is modular and can be adapted to available funding levels. They have recommend an ecosystem approach for nationwide scale-up. The government of Karnataka, in partnership with Agastya, is replicating the Creativity Lab as part of its initiative to transform education. The governments of Bihar and Punjab have requested 100 mobile science labs (Bihar) and 22 mobile science labs and 22 science centers (Punjab). Agastya reports that the government's Ministry of Education has requested Agastya to consider scaling up its model nationwide.

* The correlation/measurement of learning outcomes or enhanced opportunities (such as jobs) has not yet been conducted.

Student Stories

Rajeshwari Govindappa Bovi, a class VIII student, is a 13-year-old girl who wants to become a science teacher. Her introduction to Agastya began with a science van, which made approximately 20 trips to her school. She liked the scientific models she saw and visited the Agastya science center. Rajeshwari feels Agastya has not only helped her to improve her grasp of science but has also developed her personality. She is more outgoing and confident and can answer questions in class and provide explanations to her classmates.

Mayur Patil, a YIL and class VII student, built a low-cost science laboratory at his school. He cleared a room and stocked it with models made from objects he found at school, home, and around the neighborhood. He used the models to explain concepts to more than 60 students at his school. Mayur's sister and friends turn to him when they have a science-related query.

K. Revannavar, a class IX student, and five of his classmates embarked upon a project for better hygiene in public areas. They demonstrated the preparation and uses of phenyl (a low-cost, homemade disinfectant) at their own school, the Veer Bhadrashwar Youth Committee, Department of Education, Doddeshwar Temple and several other public spaces in their village. They set up a table, showed the manufacturing process, answered questions and handed out samples.

Sustainability and Scale-Up

Agastya's model uses a combination of private and public financial resources. It aims to reach 20 million children and one million teachers by 2020. Agastya is presently scaling up their program in Karnataka and Haryana and the governments of Rajasthan, Madhya Pradesh, Chhatisgarh, Punjab, Bihar and Odisha have expressed similar interests.

Areas to consider moving forward with regard to scale and sustainability include:

Financial Resources

Agastya's donor base consists of a few large donors with close to 45 percent of grants deriving from the Rakesh Jhunjhunwala Foundation and state governments. This narrow base of donors can be risky to the foundation's financial sufficiency. Agastya faces the challenge of raising the desired funding to achieve its goal of reaching 20 million children by 2020. As a non-profit organization, regulatory and tax considerations restrict Agastya from generating revenues other than grants. To overcome this, Agastya is contemplating setting up a different entity through which it can sell its knowledge products and services to urban schools to generate revenues and underwrite costs.

Human Resources

Agastya reports that identifying and recruiting high-quality, field-based staff from local areas in new areas is a significant challenge. The organization estimates 4,500 additional staff will be needed by 2020. To overcome this, senior management is in the process of learning from large corporate players, such as Infosys, which recruit a high number of skilled field staff. They hope to establish professional systems and processes for recruiting that work for for-profit entities.

Behavioral Challenges

Agastya reports that despite teacher training workshops, when it comes to delivery in the classroom, teachers are not motivated to make learning creative. The lack of motivation is due to the various responsibilities placed on the teacher besides instruction. This last mile breakdown hampers the effectiveness of Agastya's process for creative learning. To address this, Agastya is working on a "lab-on-a-tab" model, where experiments will be taught through a tab machine. In addition, they are developing and piloting a hands-on module to be delivered to schools.

Systems and Processes

As Agastya's outreach expands, a significant amount of data and information will need to be aggregated. Setting up appropriate systems and processes for effective and efficient management of the project will become critical for efficient measurement, dissemination and scaling up of the program. Technology can be considered an option for better monitoring, compliance and review.

Currently, Agastya is in partnership with the Indian Institute of Management to develop a nationwide impact assessment framework to evaluate the effectiveness of Agastya's programs.

Lessons Learned

Complement Government Efforts to Maximize Reach

The government is a major provider of education, particularly in rural India. For any organization aiming to make quality learning accessible to a large number of rural children, linking with government schools is an obvious choice. Agastya has based its products on the national government school syllabi to remain relevant and complement the school curricula. It supports the existing formal education system from the outside, which allows the organization the required creative space and flexibility.

Incorporate Scale into Project Design

Business ideas can make an impact only when their original thinking includes reaching a national-level scale, which almost always necessitates working with the government. Projects that do not incorporate methods and processes intrinsic to working with the government are likely to have strategies and operations that are not capable of delivering significant demonstrable impact. Agastya incorporated this approach from inception and has been working closely with the government.

Initiate Conversations at the Top to Break Systemic Inertia

Contrary to the general belief that working at a grassroots level yields better results, Agastya followed a top-down approach at government, corporate and academic levels that helped it to break systemic inertia and gain acceptance of its creative concepts. If a key decision maker buys into the project, there is reasonable probability that those farther down the hierarchy will follow suit. In addition, top-level executives can help facilitate contacts with other decision makers at a parallel level in other departments and organizations for easier and faster adoption of the initiative.

Take the Service Directly to Intended Groups for Buy-in

Agastya's model of community science centers with mobile outreach has helped them reach students at their doorstep, and it has engaged community members, sometimes as volunteers. Programs implemented in rural communities are more effective when they have buy-in from the community as demonstrated in this model. Community members can promote the cause and influence the opinions of people in their sphere of influence, and parents become more involved and supportive of their children's education.

APPENDIX I

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APPENDIX II

Case Study Research

This case study was developed through an analysis of qualitative and quantitative studies, desk review, organizational-level data analysis and local consultations.

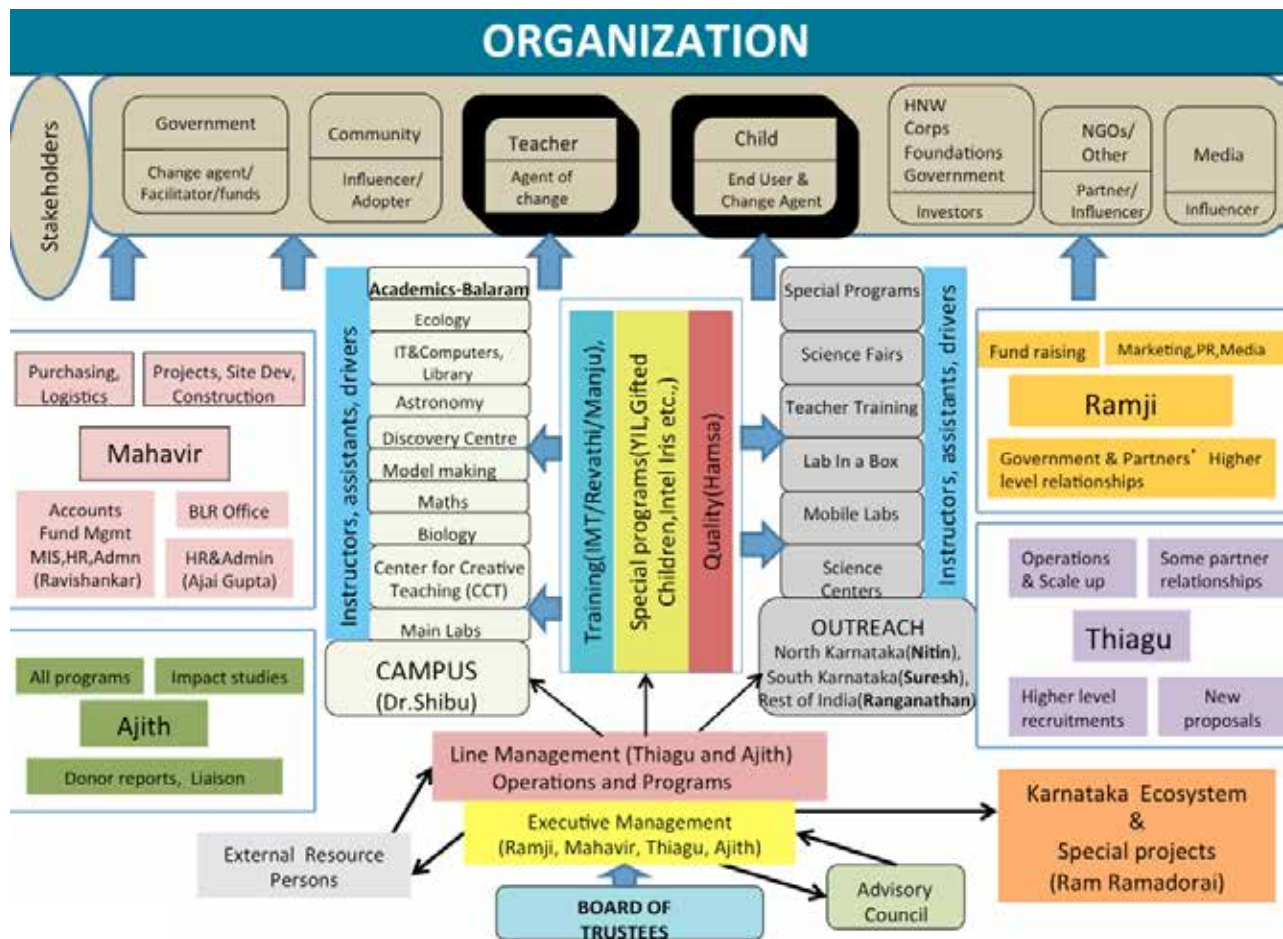
The Ministry of Human Resource Development conducted their study to examine the variety and diversity of Agastya interventions and collect stakeholder feedback from students, teachers, parents, community, school management committees and government officials. The sample size was 2,048 children in 256 schools in 24 districts. They used desk research, focus groups, observations, primary data collection and interviews with government officials.

The Best Practices Foundation conducted 39 focus group sessions with students at 33 different schools, covering a total of 1,296 students. Other stakeholders interviewed included 55 teachers, 5 Sarva Shiksha Abhiyan officials and 76 community members. They compared the responses of students who had three or less exposures to Agastya with those of non-Agastya exposed children (control groups) in Hubli and Bijapur for awareness and curiosity levels. They also studied the levels of awareness, curiosity and creativity among students across the three different exposure levels (less than 3, between 4 to 7 and 8 or more exposures to Agastya). Two characteristics—problem-solving and leadership—were measured among students in the 4 to 7 and 8 or more exposures bracket.

APPENDIX III

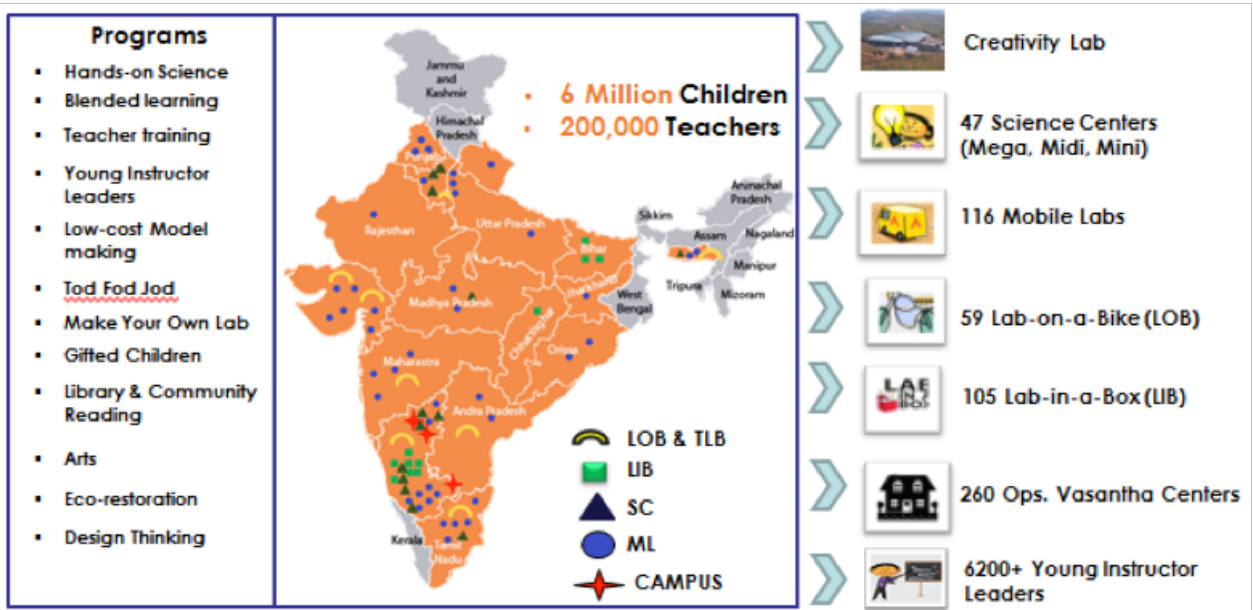
Agastya Organizational Structure

Agastya has an active Board of Trustees and a globally experienced team of professional managers. It also has a full-time team of 494 (as of March 2014) that includes 280 teachers and 150 volunteers. On the ground, in addition to implementation of various programs, specific responsibilities to enhance outreach of these programs are assigned to the operations team. This indicates the aim of the organization to reach scale. The mention of external resource



persons and an advisory council as a part of the organogram below indicates their importance within the organization.

APPENDIX IV



APPENDIX V

Expenditures for Flagship Delivery Channels

Project	Physical Requirements	Capital Expenditure (in USD)	Operating Expenditure (in USD)
Science Center	1,000–3,000 sq ft 200 science experiments	13,274	21,952–24,194
Mobile Science Lab	Vehicle + 150 experiments	21,323	23,016
Science Fairs	100–200 science experiments	Not applicable	14,919–16,129
Young Instructor Leader Program	Not applicable	Not applicable	25,283
Lab-on-a-Bike	Motorcycle + lab-in-a-box	4,032	6,274
TechLa Bike	Motorcycle + lab-in-a-box + laptop	5,516	5,516
Lab-in-a-Box	10 boxes with 100+ science experiments	2,758	4,596
Teacher Training	Batch of 30 teachers for a minimum two-day workshop	Not applicable	13 per day per teacher + transport, boarding and lodging

Note: 1 USD equals 82 INR

