

A Call for a Response from the International Chemistry Community

by Jorge Colón



A year ago, the American Association for the Advancement of Science (AAAS) published *Science for Haiti: A Report on Advancing Haitian Science and Science Education Capacity*. I was one of the coauthors of the report, along with

Gary Machlis and Jean McKendrey. This is a story of how that report came about. In addition, I summarize the report to the readership of *Chemistry International* and offer some recommendations on the current state of affairs in Haiti regarding the advancement of science and science education capacity and how the international chemistry community can respond to Haiti's current needs in these areas.

The *Science for Haiti* report was a response to the devastating earthquake of 12 January 2010 near Port-au-Prince, Haiti, that killed over 300 000 people, injured more than 300 000, and left over 1.3 million persons homeless and living in over 1300 camps and settlement sites. Much of the infrastructure, social institutions, economy, and environmental resources of Port-au-Prince and the surrounding areas were destroyed by the earthquake. Haitian education and research institutions, as well as the nation's science and science education capacity, were also badly damaged.

The earthquake devastated chemistry resources in Haiti. According to a study by the Inter-University Institute for Research and Development (INURED) from March 2010, around 90 percent of the physical infrastructure of the Université d'Etat d'Haïti (UEH), including laboratory space and classrooms, was destroyed. In addition, 380 students and 50 faculty and administrative personnel died in the earthquake. The four chemistry-teaching laboratories at the UEH were destroyed, although some of the materials and equipment were recovered. The earthquake killed 20 percent of Haiti's skilled professionals.

In February 2010, a month after the earthquake, during the AAAS Annual Meeting in San Diego, Gary Machlis of the College of Natural Resources of the University of Idaho and Science Advisor to the

Director of the National Park Service, suggested to the Committee on Opportunities in Science (COOS) for Minorities, Women, and Persons with Disabilities that the AAAS convene within 90 days of Haiti's earthquake a small meeting (20–30 people) in Puerto Rico to develop recommendations on how to help Haiti build capacity in science and science education for the long run. The COOS committee agreed, and the next day I was able to present this recommendation to the AAAS Board Meeting as part of my Caribbean Division Annual Report presentation as president of the division. Immediately thereafter, Gary and I started to organize the initiative with the help of Vaughan Turekian, chief international officer for AAAS.

We immediately agreed that science is an essential foundation for Haiti's future, but Haitian science must be Haitian-led and directed. We felt that one way in which the international scientific community could provide valuable assistance was to develop a set of well-founded strategies, policy recommendations, and proposed actions that could help guide the development of Haitian science capacity, prioritize a national program, and target international assistance. We were worried that many reports and plans being discussed by international organizations failed to mention science as an integral part of Haiti's future sustainable development and reconstruction efforts. Finally, we decided to hold in the summer a two-day workshop in San Juan, Puerto Rico, and then go to Port-au-Prince, Haiti, for two more days of workshops with Haitian stakeholders. Dr. Jean McKendrey, of the Association of American Geographers, joined Gary and me in organizing the workshops, with much needed logistical help from Dr. Fritz Deshommes, vice rector for research of the UEH.

Finally, on 10–12 July 2010, in a collaboration among the AAAS Caribbean Division and the AAAS International Office, the University of Idaho, the Association of American Geographers, and the University of Puerto Rico, the two-and-a-half-day workshop was held in San Juan, with the participation of 9 Haitian scientists and 11 other scientists from the Haitian diaspora, United States, Canada, Rwanda, and Puerto Rico. Then, from 15–17 July 2010, Gary, Jean, and I visited Haiti and met with about 60 Haitian scientists, school principals, and representatives of the Haitian government commissions on education and on information technology.

The objectives of the workshops were to 1) gather Haitian and international scientists, educators, and policy experts from diverse fields of science; 2)



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engage participants in dialogue on advancing capacity for Haitian science and science education; 3) draft strategic goals and recommendations to advance Haitian science and science education capacity; 4) prepare a formal report that could serve as a “road map” for advancing science for Haiti; and 5) present the report to Haitian officials and scientists, international scientific organizations, aid organizations, and the donor community.

The workshops were very successful and we obtained strong support from Haitian participants for initial and future collaborations. We established a network of contacts within the Haitian higher education and scientific communities. The main outcomes of the workshops were that a draft of the report was developed and that our Haitian colleagues committed to establishing a scientific society in 2010–2011.

The draft report was prepared by Gary, Jean, and me and sent to all workshop participants for review and comment. Then, the final version of the report was reviewed and approved by AAAS and published in June 2011. For the first time ever for an AAAS report, the executive summary was written in Creole, English, French, and Spanish. The report includes a one-page message from the AAAS CEO, Alan I. Leshner, encouraging “the governments of Haiti, the United States, and other nations, along with relevant scientific, development and aid organizations throughout the world, to recognize the skill and commitment of the Haitian science community and give the closest consideration” to the recommendations of the report.

The Science for Haiti report includes seven strategic goals for advancing science and science education capacity in Haiti:

1. **Advance** Haiti’s scientific capacity to link Haitian scientific expertise to Haiti’s development objectives.
2. **Invest** in science education, research, and technological innovation to generate sustainable development and prosperity for Haiti.
3. **Develop** Haitian scientific capacity and expertise to promote scientific management and

sustainability of Haiti’s natural resources.

4. **Support** existing scientific and educational organizations and institutions, and if needed, establish new ones to promote the role of science in Haitian society.
5. **Promote** the integration of Haitian science and scientists into the global scientific community, for the benefit of not only Haiti but the rest of the world.
6. **Increase** the connection of science to broader Haitian society through formal and informal education, so that all Haitian citizens have knowledge and understanding of science and its uses.
7. **Educate** Haiti’s leaders in government, business, religion, and culture, so that they better understand and value the role of science in Haiti’s economic and cultural development.

To support the achievement of the seven strategic goals, the workshop participants identified specific recommendations, policies, and actions to advance science in Haiti, each one linked to one or more of the strategic goals. The report includes 17 recommendations for advancing science capacity, such as establishing a national science and technology policy, conducting specific human capital studies, establishing internationally funded research programs that enable Haitian scientists and international colleagues to conduct collaborative research in Haiti, creating career opportunities for Haitian scientists, supporting Haitian graduate students, and developing creative approaches to promoting science within Haitian society.

The report also includes 15 recommendations to advance science education capacity, emphasizing that science education, both formal and informal, is essential at all levels of Haitian society. Among these recommendations are constructing regional “learning laboratories” and community gathering places and training more teachers and faculty to provide quality science instruction. In addition, the report recommends creating opportunities for students who excel in science to enhance their education, including internships with universities, the private sector, and government.

The report concludes with 11 recommendations to advance science governance in Haiti. One of the primary suggestions was to establish clear and constructive science, technology, and innovation policies (and where necessary, rules and procedures). To do this, the report recommends the establishment

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of an independent Haitian Academy of Science, which would inform and advise on such policy, and establish a system of accreditation that could be used to improve the quality of schools, and enforce established and new quality control standards. In addition, the report calls for the creation of effective governing bodies, well-supported institutions of higher education and research, and organizations to provide Haitian scientists with research opportunities, scientific interchange, and recognition. Participants stressed the need for the Haitian government to increase its level of support for science and science education, and urged the international scientific community to provide encouragement and assistance in developing “good governance” institutions for science.

The report was not made public until 19 September 2011 when it was first delivered and presented to the Haitian scientific community by two of the authors. We were happy to learn in September that the Haitian scientific community had established the Haitian Association for the Advancement of Science and Technology (HAAST), with Fritz Deshommes as its first president, making this the first strategic goal to be implemented. The return visit to Haiti allowed the report authors to celebrate the establishment of the HAAST, meet with the Haitian scientific community, higher education leaders, business community, and secondary school principals and science teachers, and share and discuss the report with representatives of the U.S. Embassy and a counselor to Haitian President Martelly.

The news of the report's release and our visit to Haiti were well received internationally. The AAAS press release of 19 September 2011 generated over 100 stories in mainstream newspapers, magazines, television, radio, and online news sites throughout the world. A month after visiting Haiti, Gary, Jean and I presented the report's recommendations at the AAAS Headquarters in Washington, D.C. to representatives of government, universities, and NGOs, urging them to support Haitian-led efforts to build the nation's science capacity. Scientific and aid organizations from the United States and abroad expressed their support and are already sharing with us, and with the Haitian scientific community, possible avenues of collaboration and monetary support to begin implementing some of the ideas suggested in the report. The report is available online at www.aaas.org/go/haiti2011.



The initial workshop was held in July 2010 in San Juan, Puerto Rico. Photo by Edward W. Lempinen/AAAS.

The HAAST has already decided that one of their first efforts will be to enhance the image and understanding of science among the Haitian general population. To help achieve this goal, a two-day workshop on science reporting is planned for this year. To be held in Haiti, the workshop will feature science reporter Lisa Friedman of ClimateWire and winner of the 2009 AAAS Kavil Science Journalism Award for Online Reporting.

In addition, we have learned from a close counselor to Haitian President Martelly that they have already decided to implement another of the recommendations of the report and plan to establish the equivalent of a National Medal of Science and award it to a Haitian scientist, a Haitian science teacher, and a Haitian science student to increase recognition of science within Haitian society.

The international chemistry community can help in these efforts to advance science and science education in Haiti. One of the most rewarding ways to help is by volunteering to serve for a short period as a professor in Haiti. A good example of how this can be accomplished is the Volunteer Lecturer Program (VLP, see <http://vlpnas.ning.com>) established by the Commission on Development and Exchanges of the International Mathematical Union and supported by the Board on International Scientific Organizations of the U.S. National Academies of Science. The VLP program allows a professor to visit a developing country for a month and give an intense mathematics course. This program has allowed some countries to teach a whole Masters of Science program utilizing professors from this volunteer program. Once the students in the program receive their degrees, they have now the capacity to offer those courses and continue building homegrown capacity in that science. Encouraging international chemistry organizations to establish a similar program for volunteer chemistry professors would allow for our science to develop in Haiti by building Haitian capacity.

Some universities abroad have given fellowships to Haitian chemistry students to continue or begin

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M.S. studies at their universities. For example, the Río Piedras campus of the University of Puerto Rico gave scholarships to 13 students, including 3 chemistry students, to pursue graduate studies towards a master's degree starting in August 2011. An important lesson of the first year of the UPR program is that a one-year adjustment period should be provided to incoming Haitian students in which they can adapt to the culture, learn the language, and take advanced undergraduate courses, and become comfortable with their laboratories to prepare them for a competitive graduate program. This requires an integrated approach with all faculties and campus organizations engaged in the Haitian students' education.

However, as much as this and similar efforts throughout the world can be applauded, nothing can impact as much as teaching formally and informally to the Haitian students and population in Haiti. Doing so promotes the advancement of their country and reduces the possibility of brain drain. Understanding that science, especially chemistry, is an essential element of development in Haiti, a group of Haitian chemistry professors established the Groupe de Recherches et de Developpement de la Chimie en Haiti (GRDCH, <http://sites.google.com/site/haitichimie/grdch>). During the 2011 International Year of Chemistry (IYC), the project manager of GRDCH was approved as the local IYC representative and they had plans to conduct projects such as the Global Water Experiment. Some Haitian schools received the Global Water Experiment's kits through the national commission of UNESCO in Haiti and some conferences for students were held, but, unfortunately, due to a lack of financial support, the GRDCH was unable to organize IYC projects as planned and they are still waiting for funding.

GRDCH lists on its website some of the impediments to developing chemistry in Haiti: (1) lack of awareness of the importance of chemistry from national leaders and the population; (2) lack of higher education institutions offering a major in chemistry; (3) lack of interest in careers in chemistry among high school students; and (4) lack of qualified teachers and resources such as laboratories in the schools. GRDCH plans to prepare an annual report about issues surrounding chemistry in Haiti that we should read and to which we should properly respond.


On the other hand, there are some good indicators about the future of chemistry in Haiti. The undergraduate program in chemistry at the School of Science of UEH was launched in 2003 (this program had been closed since the 1980s), several students are currently enrolled in advanced studies in chemistry outside the

country (including staff of the GRDCH), and nowadays Haiti is globally more open to technology and science. GRDCH is committed to chemistry and its key role in the development process of Haiti. Its motto is "La chimie au service du developpement"—Chemistry in service of development.

There is reason to be optimistic for such development, with the planned construction of new science infrastructure. A new USD 150 million UEH main campus in 60 hectares of land is planned to be built in Damien, a district of Port-au-Prince 15 km from downtown, with buildings for classrooms, libraries, laboratories, dormitories, and restaurants to house 15000 students and 1000 professors, although funds for this project have not yet been approved. However, already a new university campus was inaugurated on 12 January 2012 at Lemonade in the north of Haiti, with USD 50 million from the government of the Dominican Republic, Haiti's neighboring country. Both campuses plan to have a strong science component.

Scientific capacity is required to advance technological innovation and economic opportunities in Haiti, improve medicine and health care, create access to drinking water, improve disaster preparedness and mitigation, develop sustainable agriculture and reduce hunger, manage natural resources, educate citizens, and promote human rights. The role of science in reconstruction, recovery, and development of Haiti will depend on the development of scientific capacity integrated into the full range of local, regional, and national efforts to rebuild the nation.

I urge the readership of *Chemistry International* to engage in collaborative efforts among Haitian and international scientists through the *Science for Haiti* report, which provides an initial "road map" for advancing science and science education in Haiti.

Access to the benefits of scientific progress is a human right as important as any other. Scientists should be committed to helping communities by sharing their knowledge and information and working jointly to allow them to solve their problems. We hope you will share this commitment with us and accompany us on this mission, since "Caminante no hay camino, se hace camino al andar." We as chemists can do our part. Join us in these efforts. 

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