



ILSI | Research
Foundation
2014 Annual Report

Letter from the Executive Director



Morven McLean
Executive Director



Suzanne S. Harris
Past Executive Director
ILSI Research Foundation



Jerry Hjelle
Past President
ILSI



Adam Drewnowski
Chair, Board of Trustees
ILSI Research Foundation

It is my pleasure to be sharing this Annual Report with you, a first for the ILSI Research Foundation. This represents a new way for the organization to provide information about its programs, progress and achievements, and is one part of our ongoing commitment to constantly improve our communications with the stakeholders and scientific community that contribute so much to our work. 2014 was a time of significant change at the Research Foundation, and I would like to use this column as an opportunity to acknowledge and thank two people who have been, and continue to be, very important to the foundation.

Dr. Suzanne S. Harris retired from her position as Executive Director, ILSI Research Foundation on December 31, 2014. Dr. Harris served as Executive Director of the ILSI Human Nutrition Institute from 1989 to 2005, when she became the ILSI Research Foundation Executive Director. She spearheaded many of the Research Foundation's most successful scientific programs, and has ably guided the organization through a period of rapid evolution. Dr. Harris will continue to provide leadership to ILSI globally as she is retaining her position as ILSI's Executive Director, and we are all grateful for her continued commitment.

Dr. Jerry Hjelle completed his two year term as President of ILSI in January 2015. During his tenure, Dr. Hjelle worked across the global organization to advance implementation of ILSI's Strategic Plan, and promoted the reorganization of ILSI's scientific programs across four thematic areas: Food and Water Safety; Risk Science and Toxicology; Nutrition and Health; and Sustainable Agriculture and Nutrition Security. These focus areas provide structure for ILSI to identify and respond to critical scientific issues, build new partnerships with scientists around the world, and raise awareness about ILSI's programs and impact. We are fortunate that Dr. Hjelle will continue to serve as Vice-Chair of the ILSI Research Foundation Board of Trustees.

All of our research and capacity building programs benefit from the guidance provided by our Board of Trustees and Advisory Council members, and the expertise and experience of the hundreds of scientists who give so generously of their time. However, none of this would be possible without the staff of the Research Foundation, and I count myself very fortunate to work with such a dedicated and talented team. I look forward to continuing to engage with all of you to advance the mission of the ILSI Research Foundation, and look forward to your comments or suggestions.

Morven A. McLean, Ph.D.
Executive Director

"We are profoundly grateful to Suzie Harris for her dedicated long-term leadership of the Research Foundation. Suzie has solidified the international reputation of ILSI Research Foundation for generating and disseminating high-quality science worldwide. By inspiring ILSI to embrace program innovation, Jerry Hjelle has placed sustainability, environment and human health on the ILSI agenda. ILSI Research Foundation is well positioned to be at the forefront of activities in these vital and cutting edge areas."

-Adam Drewnowski

"The Research Foundation has existing valuable programs in risk assessment and in biotechnology that have been built around the globe. These programs have had a positive impact on environmental and human safety. Our more recent initiatives in sustainable food and nutrition security are starting to bear fruit. Building on the open-data model of the our Crop Composition Database, I'm very excited about new opportunities to advance studies on nutrient composition of foods and dietary intake in low and middle income countries."

-AD

Table of Contents

- Letter from the Executive Director
- Overview of ILSI Research Foundation
- Year in Review
- Scientific Program Areas
 - Sustainable Agriculture and Nutrition Security
 - Food and Water Safety
 - Nutrition and Health
 - Risk Science and Toxicology
- 2014 Publications
- ILSI Research Foundation Board of Trustees
- ILSI Research Foundation Staff
- ILSI Research Foundation Advisory Committees
- 2014 Financial Statements

Overview of ILSI Research Foundation



The International Life Sciences Institute Research Foundation (ILSI Research Foundation) is a non-profit, public charitable organization with a mission to improve environmental sustainability and human health by advancing science to address real world problems. Established in 1984, the ILSI Research Foundation has long been an international leader in building effective public-private partnerships by ensuring that its programs are collaboratively developed and implemented with scientists from the private, academic, government and non-governmental sectors. Adherence to this approach means the ILSI Research Foundation's programs in nutrition, toxicology, risk assessment and agriculture are informed and strengthened by the deliberate inclusion of international, multi-sectoral expertise and perspectives.

ILSI is a non-profit, worldwide federation of entities comprised of the ILSI Research Foundation, the Health and Environmental Sciences Institute (HESI), and 16 country or regional branches (see www.ilsf.org). The ILSI Research Foundation differs from the other entities in that it is financially supported through grants it receives from public and private sector organizations, while HESI and the ILSI branches are membership-based organizations that receive funding primarily through member fees. All of the ILSI entities are collaborative science organizations that convene scientists from government, academy, industry and civil society organizations to generate scientific information and encourage scientific dialogue. ILSI's work must be for public benefit.

Mission

The ILSI Research Foundation improves environmental sustainability and human health by advancing science to address real world problems.

Vision

The ILSI Research Foundation is internationally recognized as a valuable partner in generating and disseminating scientific information that improves environmental sustainability and human health.

Values

Public Benefit: The ILSI Research Foundation's programs are conceived of and implemented for public benefit.

Collaboration: The ILSI Research Foundation actively seeks out and promotes partnerships believing the best scientific work is done collaboratively with a range of diverse stakeholders, with special outreach to other ILSI entities.

Transparency: The ILSI Research Foundation believes in a transparent scientific process where hypotheses and experimental design are developed collaboratively and openly, and research outcomes are made publically available.

Integrity: The ILSI Research Foundation follows the ILSI Code of Ethics and Organizational Standards of Conduct which outlines the principles binding the organization to rigorous, peer-reviewed scientific investigation and scientifically balanced, evidence-based work products.

Global Perspective: The ILSI Research Foundation understands that in order to be effective, science-based solutions to environmental and human health concerns must be relevant and accessible around the world.

Year in Review



Global Impact



2,975 trained workshop participants



21 research publications

Online Presence



73,864 visits to the Crop Composition Database



358 followers on Twitter



5,460 visits to the website



380 Tweets

Sustainable Agriculture & Nutrition Security



The world faces escalating challenges to produce sufficient nutritious and affordable food in the face of multiple constraints, including climate change and resource scarcity, while also working to ensure ecosystem preservation. Although agricultural productivity has increased significantly, it is not keeping pace with demand. This is especially true of important staples such as cassava and rice, where gains in yield have been comparatively lower than for commodities like maize and soybean. This is also a major concern for fruits and vegetables which are critical to balanced, nutritious diets.

Today, one in seven people worldwide suffers from malnutrition and recent studies suggest production of certain crops may need to double to keep pace with projected food demands. Climate change, population growth, and other rapid changes to the environment and food system confront our ability to adequately feed the world. The ILSI Research Foundation recognizes these significant challenges, and has several programs focused on improving the ability of food systems to feed a growing population while addressing both nutrition and sustainability concerns.

Assessing “Sustainable Nutrition Security”

As detailed in a recent National Academy of Sciences report, food systems are complex adaptive systems, which means they exhibit unintended consequences. For instance, doubling the consumption of fruits and vegetables, a common nutrition-based recommendation, has multiple potential sustainability consequences for both the environment (e.g., ground water depletion) and social domains (e.g., increased demand for farm labor). Effectively balancing both nutrition and sustainability considerations is a major challenge,

but one the ILSI Research Foundation has embraced. In May 2014, the ILSI Research Foundation released a working paper entitled “Assessing Sustainable Nutrition Security: The Role of Food Systems.” Subsequently, in July 2014, the Research Foundation announced a new partnership with the International Food Policy Research Institute (IFPRI) and the Agricultural Model Intercomparison and Improvement Project (AgMIP) to conduct a global assessment of sustainable nutrition security (SNS). This will be the first assessment to include all important staple and non-staple foods, and will measure nutrition and sustainability outcomes using a novel set of food system metrics developed through a broad stakeholder-engagement process.

Improved Modeling: Getting Better Tools

Sophisticated computer models – integrated models – are used to assess how crop production is impacted by climate and other changing factors such as food demand, freshwater availability, etc. Unfortunately, current integrated models do not include robust nutrition and sustainability metrics, and the underlying methodology often relies on outdated input data or inappropriate assumptions. The ILSI Research Foundation is partnering with others to begin identifying needed improvements for such models and prioritizing which should be addressed first.

In September 2014, the ILSI Research Foundation co-led a workshop at Purdue University to identify both potential improvements for some models as well as new developments needed for the SNS assessment. Incorporation of these improvements will begin as work on the SNS assessment is undertaken (see text box).

Pursuing the Promise of “Open Data”

A lack of available, validated data is a major limiting factor for the conduct of the SNS assessment. Examples of needed data include agricultural (crop yields, agronomic trial results, pest and disease trends); economic (food prices, incomes); nutritional (food nutrient composition, consumption patterns); and sustainability (life-cycle assessment of foods and food systems, loss and waste, social dimensions). Consistent with the ILSI Research Foundation’s principles of openness and transparency, it is essential that all of the data underpinning the SNS assessment are “open data”.

The ILSI Research Foundation is partnering with many public and private organizations to solicit, assemble, and curate such open data. Along with others, we are investing in a pilot demonstration of one proposed platform for this purpose called GEOSHARE, hosted at Purdue University. Another focus is the development of a proposed Open Data Processing Service. This would enable public- and private-sector owners of large, relevant datasets to easily and effectively make the shareable portions of those data available to the global scientific community as open data. A first example of this process was published in the peer reviewed literature in early 2014, involving a large private-sector maize breeding trial database. Further examples are being sought and will be similarly released, in order to support the SNS assessment.

 **216** tri-partite collaborators



Model improvements identified at Purdue University

1. Create new models for nutritionally-relevant crops/foods for which none are currently available
2. Include the effects of both biotic (weeds, pests, disease, etc.) and abiotic (e.g., ozone) stressors on food production and loss
3. Account for price volatility of commodities by including the effects of extreme weather and other shocks within the economic models
4. Break large, complex models into shareable components, supporting transparency, greater collaboration, and acceleration of other improvement

Food and Water Safety

The ILSI Research Foundation promotes science-based approaches to the safety assessment of foods and feeds, with a strong emphasis on improved knowledge dissemination and capacity building.

Experiential Training in the Safety Assessment of GE Foods

Although most countries indicate that their risk assessments of genetically engineered (GE) foods are founded on Codex Alimentarius principles and guidelines for the risk analysis of foods derived from modern biotechnology, there remain significant differences in data and information requirements in practice. These add complexity, time, and cost for public and private sector product developers and regulatory authorities, and also stand in the way of achieving regional or sub-regional regulatory cooperation.

In 2014, the ILSI Research Foundation developed a strategic program of capacity building that focused on technical training of three critical stakeholder groups: (1) regulators and scientists from the public sector who are called upon to conduct safety assessments on behalf of national biosafety committees; (2) public sector scientists engaged in product development; and (3) scientists from public institutions that are functioning as contract research organizations to provide testing services for public sector product developers.

Crop Composition Database

3 new crops | **7x** more data | **3150** compositional components

Access the Crop Composition Database at www.cropcomposition.org

Program implementation, achieved with funding from the United States Agency for International Development (USAID) and significant in-kind support from DuPont Pioneer, was divided in two phases. Phase I established a baseline understanding of the concepts and principles of GE food safety assessment. Phase II emphasized experiential, lab-based training in toxicity testing. Training additionally included topics such as study design and methodology, data collection and interpretation, data quality assurance processes, and report preparation.

Enhancing Crop Research

Crop, food, and feed composition studies are considered an essential part of the safety assessment of new crop varieties, including those developed through biotechnology. Information obtained from such studies is used to assess similarities and differences in important nutrients and anti-nutrients. The ILSI Research Foundation was very pleased to release Version 5.0 of the ILSI Crop Composition Database in 2014. This comprehensive, open database provides information on the natural variability in composition of conventionally grown crops, including information on amino acids, bio-actives, carbohydrates, fatty acids, fiber, glucosinolates, minerals, other metabolites, phospholipids, proximates and vitamins. This updated version has seven times more data than the previous version, and added canola, sweet corn and rice to the crops previously included: field corn, soybean and cotton.

Nutrition & Health

In almost all regions of the world, governments and health practitioners, amongst many other groups, are very concerned with the social, health and productivity impacts of both over- and under-nutrition, including increasing rates of obesity. These topics have long been a part of the ILSI Research Foundation's research activities.

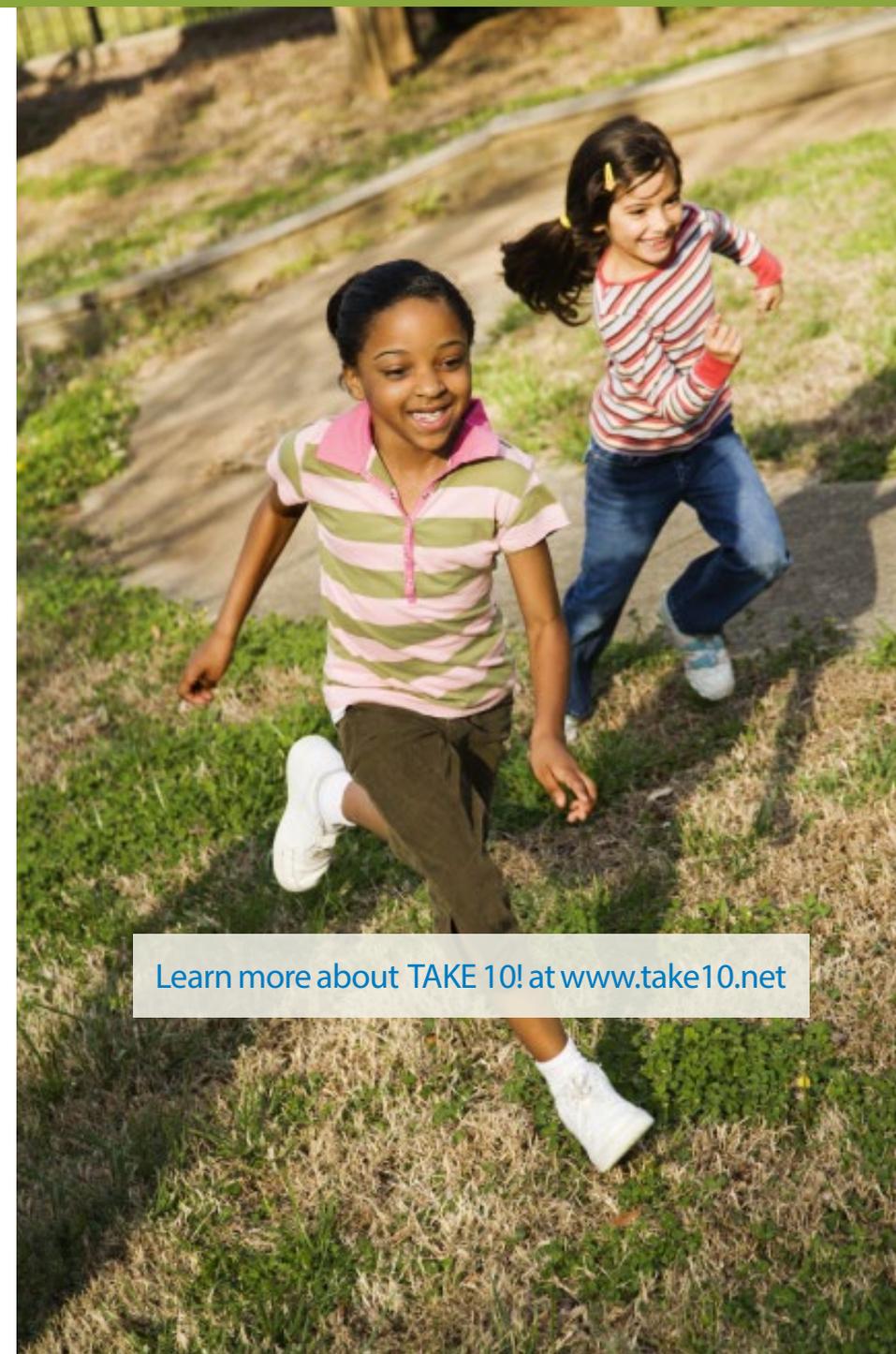
Promoting Healthy Lifestyles in Children

With overweight and obesity being an international problem facing children and adults, instituting preventative measures in the early years is integral to improving the health and wellness of children. Fifteen years ago, the ILSI Research Foundation worked with teachers and health experts to develop TAKE 10!®, a school-based intervention program focused on bringing physical activity into the classroom.

This program includes short, curriculum-based activities in the classroom, providing children with an opportunity to be physically active and understand the importance of fun, physical activity and other healthful behaviors, including nutrition. With an evidence base to support the effectiveness of TAKE 10!, the ILSI Research Foundation has worked with several ILSI branches to translate and adapt this program for schools in other countries. In 2014, ILSI Sur-Andino adapted TAKE 10! and completed a pilot study in Santiago, Chile. Early results found an increase in physical activity and a significant decrease in blood pressure of participating children. With data from this and other studies of TAKE 10!, the ILSI Research Foundation will seek to improve the program to help children increase physical activity and adopt healthy habits they can use for life.

"This workshop completely changed the way I look at the biosafety data. It immensely improved my analytical ability as well as confidence."

Learn more about TAKE 10! at www.take10.net



Risk Science & Toxicology

The ILSI Research Foundation has an extensive program of work on developing and disseminating science to improve environmental risk assessment. This includes conceptual work on problem formulation as well as very practical programs aimed at translating relevant science into understandable training for building capacity.

Environmental Risk Assessment Workshop: Impacts on Non-Target Organisms

In June of 2013 and 2014, the ILSI Research Foundation, in cooperation with the Agricultural Research Service, United States Department of Agriculture, Iowa State University, and DuPont Pioneer, convened technical training workshops on the assessment of impacts from insect-resistant crops on non-target organisms. The purpose of the workshops was to provide regulatory scientists and environmental risk assessors from fourteen countries with a unique experiential learning opportunity.

Using laboratory facilities provided by Iowa State University, and materials and methods developed by scientists at DuPont Pioneer specifically for this training exercise, workshop participants worked in the lab and in the field to set up the same types of experiments that crop developers use to assess the impacts of insect-resistant crops on beneficial organisms, such as pollinators and predators. Guided by the experience of expert faculty, including agronomists, entomologists, and toxicologists, the participants also learned how to interpret the data obtained from their experiments and how to most effectively use these data to inform risk assessments of GE crops.

Post-event surveys indicated that the workshops have been extremely effective in building technical capacity and that the participants are putting what they have learned into practice when conducting their own risk assessments.

Promoting Data Sharing for Environmental Risk Assessment

It is commonly held that confined field trials (CFTs) used to evaluate the potential adverse environmental impacts of a GE plant should be conducted in each country where cultivation is intended, even when relevant and potentially sufficient data are already available from studies conducted elsewhere. The acceptance of data generated in CFTs “out of country” can only be realized in practice if the agro-climatic zone where a CFT is conducted is demonstrably representative of the agro-climatic zones in those geographies to which the data will be transported. In an attempt to elaborate this idea, a multi-disciplinary Working Group of scientists collaborated to develop a conceptual framework and associated process that can be used by the regulated and regulatory communities to support transportability of CFT data for environmental risk assessment (ERA).

Application of the conceptual framework provides a scientifically defensible process for evaluating if existing CFT data from remote sites are relevant and/or sufficient for local ERAs. It promotes a strategic approach to identifying CFT site locations so that field data will be transportable from one regulatory jurisdiction to another. Application of the framework and process should be particularly beneficial to public sector product developers and small enterprises that develop innovative GE events but cannot afford to replicate redundant CFTs,

and to regulatory authorities seeking to improve the deployment of limited institutional resources.

Biosafety Risk Assessment and Regulation in South Asia

The Indian subcontinent provides immense challenges and opportunities for the use of GE plants, and the ILSI Research Foundation has been engaging with partners in the South Asia region to establish a set of long term, sustained capacity building programs geared toward assisting countries in developing and implementing functional biosafety regulatory systems that suit their domestic needs. USAID awarded the ILSI Research Foundation with the South Asia Biosafety Program (SABP), a regional capacity building program that provides technical assistance in Bangladesh, India, and Pakistan. Although each country program is supported by an independent grant from USAID, they are managed together to take advantage of regional harmonization activities, and shared expertise and resources. In addition, Bangladesh was a partner in the ILSI Research Foundation managed Partnership for Biosafety Risk Assessment and Regulation which was funded by the World Bank’s Development Grant Facility from 2012-2014.

This year saw the development of several important milestones in the region. In Pakistan, 2014 marked the third year of the ILSI Research Foundation’s Biosafety Research in Pakistan Grants Program (BRPGP) – a small grants program intended to raise the profile of biosafety as a scientific endeavour and support basic research related to biosafety within

 **5 grants awarded in 2014**

View the latest publications at www.ilsf.org/ResearchFoundation/Pages/Publications.aspx



“Using the knowledge and skills gained from the workshop, I am now serving as a resource person to the technical team as we strive to put together reporting guidelines in ERA and problem formulation of the GM crops under review in Kenya as we anticipate environmental release.”

“This initiative taken by CERA will have a long lasting impact on the training of manpower and capacity building for research and regulation of genetically modified plants in Pakistan.”

the country. Five additional research projects were awarded grants, bringing the project total to 16. The program is now well known in Pakistan and has succeeded in bringing together a community of practice that can serve as an important information resource for the Pakistan government. This program and the ILSI Research Foundation were recognized by the Director General of Pakistan’s Environmental Protection Agency, who attended the first BRPGP workshop to hear presentations from the 2012 and 2013 grant recipients. He has proposed there be additional meetings to continue discussions on biosafety in Pakistan and pledged to support them.

In Bangladesh, with technical and organizational support from the ILSI Research Foundation, the Bangladesh Department of Environment convened a drafting group to formalize ERA guidelines for the assessment of GE plants in Bangladesh. This document was circulated and made available for

public comment and has been adopted by the Bangladesh Ministry of Environment, representing the first time Bangladesh has had clear and specific guidance on how regulators expect an ERA to be conducted.

The culmination of the ILSI Research Foundation efforts with the SABP’s regional management approach was realized in the 2nd Annual South Asia Biosafety Conference, which took place in Colombo, Sri Lanka in September. In response to the request of SABP partner governments, the conference has been annualized and the location in Sri Lanka was based on feedback from country partners to expand SABP’s activities within the South Asia region. The conference itself took place over two days and addressed important topics related to local biosafety research, GE plant development, as well as climate change and other challenges for agriculture in the 21st century.

179 participants at 2nd South Asia Biosafety Conference in Colombo, Sri Lanka

Participants came from **11** countries



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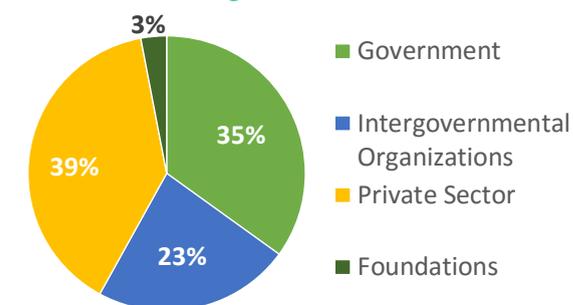
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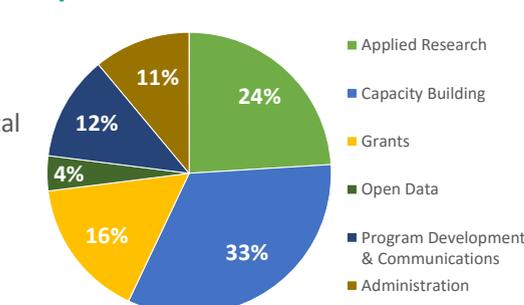
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2014 Financial Statements

Sources of Funding



Expenses



The ILSI Research Foundation is funded by grants and donations from public, charitable and private sources. In 2014, the ILSI Research Foundation received \$2.6 million in grants, with 58% from governmental and inter-governmental organizations, 39% from private sector and 3% from other foundations. The Research Foundation continues to manage its budget prudently. In FY2014, research and capacity building programs accounted for 77% of expenses, program development and communications for 12%, and administration for 11%.



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