



# CIRE

The Center for  
International Research,  
Education, and Development

## Applying Virginia Tech's Knowledge to Global Challenges



International development work has many rewards. Sometimes results are visible and meaningful. But international development also has its challenges, and many development projects fail. While more scrutiny is needed to determine which practices are effective and which are not, what is clear is that development has a lot to do with the strength and effectiveness of a country's institutions, especially its educational institutions.

For decades, Virginia Tech has created, conveyed, and applied knowledge to global challenges. The university does this through research and technological innovation, engagement with outside partners and local stakeholders, and by educating students to be the next generation of global problem solvers. Integral to all efforts is an emphasis on improving standards of living and the livelihoods of people in developing countries.

We believe that through our research, partnerships, and capacity building, we contribute to solving problems in the world that affect all of us.

Located within Virginia Tech's Outreach and International Affairs, CIRED is a university-wide center that seeks partnerships and funding in support of the university's research, teaching, and development efforts across the world. CIRED links Virginia Tech to the world through projects and activities that engage faculty, students, and staff. One of these is the USAID-funded Innovation Lab for Integrated Pest Management (IPM IL), which works with people, communities, and institutions to develop solutions to the agricultural challenges they face. The work is more than just about crop damage caused by pests and disease; it also addresses gender, nutrition, training, and equitable use of resources. CIRED has managed the IPM Innovation Lab since 1993.

Our work with universities in Africa, Asia, the Middle East, and Latin America strengthens the education of the next generation of scientists, teachers, and leaders. An example is the USAID-funded Education and Research in Agriculture (ERA) project in Senegal, which uses the land-grant model to help the country improve agriculture and food security through collaborative research, education, and extension activities. In addition to the ERA project (2011-2018), Virginia Tech recently was awarded a five-year spin-off project, Youth in Agriculture (YIA). We plan to be working with our Senegalese colleagues not only for the next five years, but also for many decades to come.

A focus on women and gender in international development ensures that all of our projects and activities are gender-sensitive and have a positive impact on beneficiaries with less access to resources, many of whom are women and girls. The CIRED Women and Gender in Development (WGD) program is highlighted in this publication as are the IPM Innovation Lab and the ERA and YIA projects in Senegal.

In all of our efforts, we are committed to working with local stakeholders and partners – policymakers, researchers, teachers, business people, development practitioners, farmers and others living in rural communities – to help them have the tools and knowledge they need to improve their lives, and the lives of those they work with and serve. We extend our collaborative approach to all in the spirit of Virginia Tech's motto – *Ut Prosim* (That I May Serve).

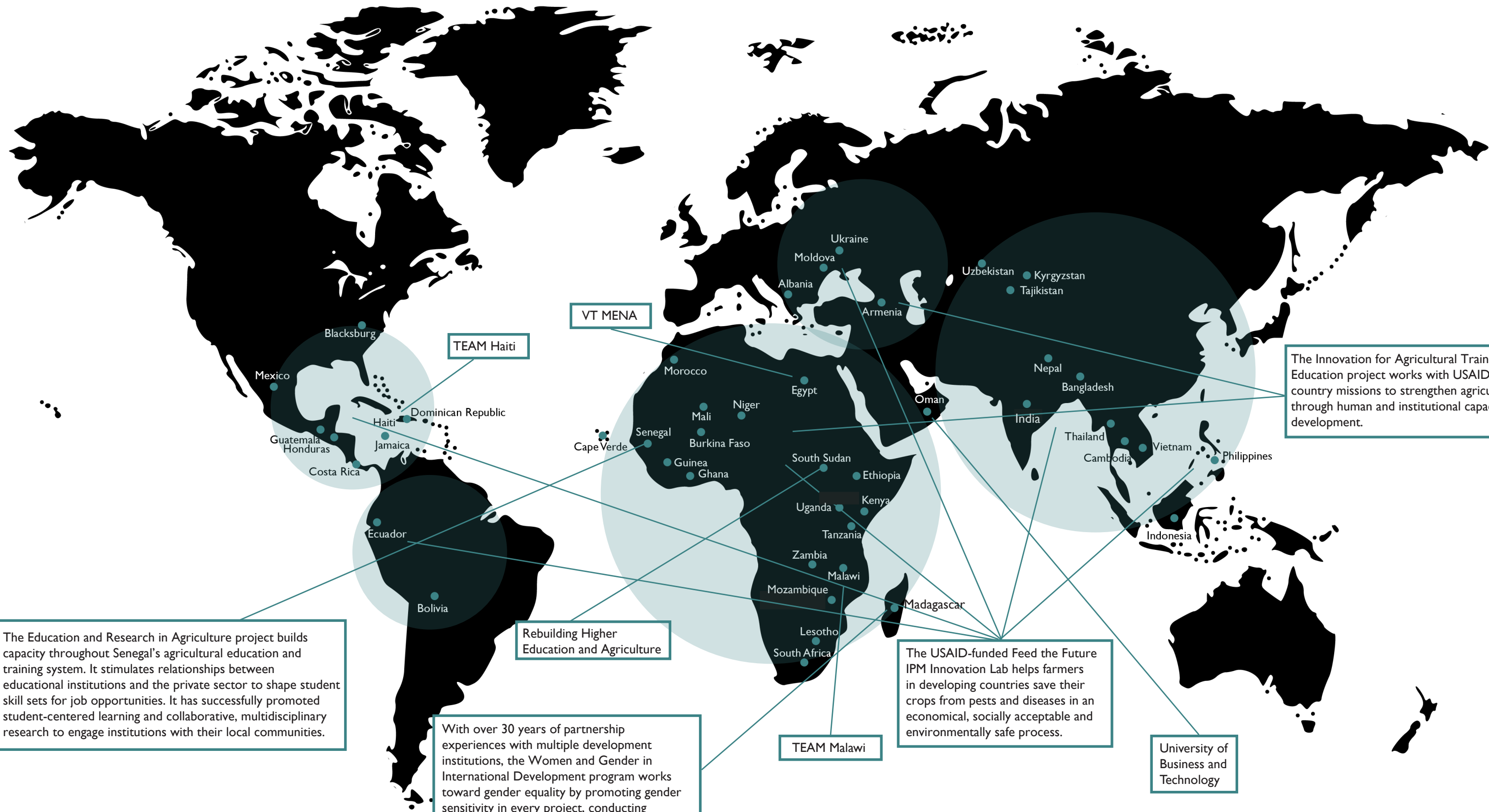
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## The History of CIRED

Virginia Tech was founded in 1872 as a public land-grant university. Discovery, creation, and dissemination of knowledge has always been central to its global mission. University faculty conducted agricultural development projects in Africa and Asia in the 1960s and in 1971, Virginia Tech President T. Marshall Hahn created the University Committee on International Programs (UCIP) to coordinate such work.

In 1975, the U.S. Congress passed Title XII of the Foreign Assistance Act, which mobilized the research, teaching, and extension expertise of U.S. land-grant institutions and established the Board for International Food and Agricultural Development (BIFAD). Virginia Tech hosted BIFAD's first Conference on International Development with the National Association of State Universities and Land Grant Colleges. After the university received its first Title XII grant in 1978, it added a then groundbreaking Women in World Development component to its work. The 1980s saw Virginia Tech President William Lavery name the chair of BIFAD and UCIP consolidate international development projects into the Office of International Development (OID).

In 1991, OID became the Office of International Research, and Development (OIRD) and over the years established itself as a leader in international development. The office's mandate was expanded in 2002, when it was renamed the Office of International Research, Education, and Development (OIREd). In 2018, OIREd became CIRED, a new center focused on continuing Virginia Tech's global legacy.



The Education and Research in Agriculture project builds capacity throughout Senegal's agricultural education and training system. It stimulates relationships between educational institutions and the private sector to shape student skill sets for job opportunities. It has successfully promoted student-centered learning and collaborative, multidisciplinary research to engage institutions with their local communities.

With over 30 years of partnership experiences with multiple development institutions, the Women and Gender in International Development program works toward gender equality by promoting gender sensitivity in every project, conducting interdisciplinary research that ensures that women benefit.

Rebuilding Higher Education and Agriculture

TEAM Malawi

The USAID-funded Feed the Future IPM Innovation Lab helps farmers in developing countries save their crops from pests and diseases in an economical, socially acceptable and environmentally safe process.

University of Business and Technology

The Innovation for Agricultural Training and Education project works with USAID country missions to strengthen agriculture through human and institutional capacity development.

VT MENA

TEAM Haiti



The IPM project is working to control pests such as the fall armyworm

## Integrated Pest Management – A Legacy of Innovation and Transformation

Imagine a small farm in a developing country. Imagine clusters of papayas turning dark green to yellow. Imagine a row of eggplants lying like glossy pearls. Imagine a field of maize, free of insect damage, the silky ears full and ready to eat. Imagine a family with food on the table and children in good health.

For farmers around the world, the ability to grow a healthy vegetable, fruit or grain crop means all these things are possible. The difficult part is protecting plants from their pests, the insects who devour them with each bite. At the Feed the Future Innovation Lab for Integrated Pest Management (IPM IL), housed at CIREd and funded by USAID, a team of scientists protects plants from pests, the ultimate goal being to feed the world's growing population while minimizing the damaging impact on health and the environment often associated with modern agricultural production.

The IPM IL team started at Virginia Tech in 1993, with entomologist Muni Muniappan serving as its director since 2006. It has developed packages of IPM technologies to help farmers avoid the use of toxic chemical pesticides to eliminate crop pests and diseases. While the Innovation Lab has worked in nearly thirty countries directly, its reach resembles the insects the scientists study – it is long, sprawling, and alive.

In its current phase, the IPM Innovation Lab works in seven core countries in East Africa and Asia, but over the years, it has worked in 23 countries covering seven regions.

Through the work of biological control and a combination of other IPM technologies, the Innovation Lab has developed the ability to sustain agricultural growth for communities in ways that pesticides alone cannot. In Indonesia, degradable plastic bags protect cocoa plants. *Trichoderma* combats diseases impacting crops from India to Honduras. In Niger, parasitic wasps diminish millet headminers, while in Ethiopia, Kenya, and Uganda, the Innovation Lab fights *Parthenium*, an invasive weed that displaces native plants and taints meat and dairy products.

The Innovation Lab provides leadership in IPM research by conducting trainings and conferences across the globe, supporting graduate students in multiple countries, and funding dozens of other institutions with a shared mission to battle global hunger. It also pioneers new techniques, such as modeling pest invasions through a partnership with Virginia Tech's Biocomplexity Institute.

Considering the social implications of agricultural decisions, such as the impact on women, is another component of the Innovation Lab's work. This approach leads to increased yields, lower production costs, and increased incomes. More than that, women have been empowered to participate in critical conversations about IPM developments that affect their work.

For countless farmers and communities throughout the developing world, the impact is more tangible – an ample harvest, cleaner environment, and a sustained community.

*"I have traveled to many countries with the Virginia Tech-based IPM IL management entity and their collaborating scientists, and I continue to be impressed by their hard work, organization, and vision. In addition to developing technologies to tackle pest problems, it also helps prevent and mitigate pest problems by tracking invasive species worldwide and raising awareness in countries well ahead of the invasion...It has one of the best track records among all of the Innovation Labs for leveraging additional USAID mission funds, and is a vital component of USAID's sustainable intensification strategy" - John E. Bowman, Senior Agriculture Advisor, USAID Bureau for Food Security*



The WGD team is researching how Ethiopian women help control weeds

## Creating Impacts - Discovering and Improving Gendered Dimensions of International Development

The gendered dimensions of our lives are sometimes clear and easily discovered. Obstacles and gaps can be revealed and even vanquished. In other spaces they are inconspicuous, difficult to see and even more difficult to change. Worldwide, gender inequality is persistent, and like roots that grow deeply, the obstacles are hard to remove. While there has been progress towards gender equality, including equal access to primary education between girls and boys, women and girls continue to suffer discrimination and violence in every part of the world.

The Women and Gender in International Development (WGD) program works towards gender equality in development by promoting gender sensitivity in every CIREd project, conducting interdisciplinary research on gender issues, and ensuring that women benefit. An international development project is truly successful when it is inclusive, equitable, and based on the priorities of local groups.

As a learning community and academic resource, the WGD team builds capacity to address gender disparities in the areas of agriculture, natural resource management, education, food security, health and nutrition, and water. The WGD program works collaboratively with Virginia Tech faculty and students, partner organizations around the world, and other stakeholders to increase opportunities for women while achieving the technical goals of CIREd's projects.

The program also provides a forum for information exchange, research, and teaching for students, staff, and faculty. Its speaker series brings scholars, researchers, and practitioners from around the world to Virginia Tech to offer their perspectives on gender and development.

WGD explores how local knowledge is gendered and affects sustainable development. In Nepal, the WGD team documented how increased opportunities to participate in community integrated pest management (IPM) activities may help women take on new agricultural and leadership roles. In Bolivia, research determined the foundational difference between men's and women's knowledge of soil. In the Philippines, the WGD team documented how women are responsible for domestic activities and marketing crops. In Ghana, research conducted by the team determined that women face more constraints than men in tomato production and may be less likely to adopt labor-intensive IPM strategies. In Bangladesh, and Indonesia, the team's research outlined how cultural limitations on women's mobility may affect their participation in IPM projects. In several countries in Africa and Asia, the team researched the factors constraining women's opportunities in agricultural higher education programs.

*"Others had practiced integrated pest management before. I joined the group later on. I learned fast and practiced in a good way. I have grown vegetables better than the other members involved in the group. A trainer from the office has come here for observation and took a photograph of my plot. I did good. In the cooperative, no one has grown such a good amount of tomatoes and now bittergourd, too. I feel very happy when I see the vegetables growing in such a good way on my plot. I feel motivated to grow more."*

**- Woman farmer from Dasharathpur Goramare, Nepal, who participated in an integrated pest management activity**



Children learning 4-H in Senegal

## CIREd in Senegal – Change for a Better Future

When people don't have to worry about finding enough to eat, life's possibilities are unlocked. Workers have the energy for their labors. Children can learn, grow, and imagine an existence that they shape. Communities achieve a level of stability that allows them to work toward a better future. Citizens can engage in their country's social, cultural, and economic life, using their minds and hands to enrich their experiences and environments.

Food not only feeds the hungry – it also feeds the future.

Like many African nations, Senegal's growing population is skewing urban, yet three-quarters of the workforce is agricultural. With 60 percent of the population under 25 years old, and with food insecurity and malnutrition higher in rural areas, training a new generation to guide the country to greater self-sufficiency and environmental resilience is a national priority. The vibrant minds within these communities must obtain the skills, knowledge, and confidence required to create a better future for their country, which demands a change in Senegal's agricultural education, training, research, and extension system.

The USAID-funded Education and Research in Agriculture (ERA) project uses the U.S. land-grant model to build institutional capacity to ensure broad participation, including for Senegalese women and girls. ERA has trained more than 500 agricultural educators in student-centered learning, including syllabus development and experiential learning. ERA also helped create a nationwide network to support e-learning.

Employers in Senegal find that graduates lack the skills necessary to perform their jobs. To help close this gap, ERA works closely with faculty members to link course content with market demand. ERA promotes the contributions of advisors from the private sector to help educational institutions better understand needed skill sets.

ERA is boosting entrepreneurial participation by joining university expertise in quality control and food safety with the energy of women's business groups, increasing value-added processing of local fruits and cereals. Additionally, ERA has forged strong ties between agricultural researchers and local farmers, resulting in the use of new technologies that improve the production of Senegal's primary crops of rice, millet, and corn.

ERA started a rural positive youth development initiative based on the U.S. 4-H model. 4-H equips youth with personal growth skills, including entrepreneurship and leadership. This initiative was so successful that USAID awarded CIREd the Senegal Youth in Agriculture (YIA) project to further expand 4-H throughout Senegal.

In 2014, the National Assembly of Senegal passed a new law that created a community outreach mission for universities, as well as requiring local, private-sector membership on university advisory boards. CIREd's work in Senegal demonstrates how Virginia Tech's expertise and experience as a land-grant university can be adapted successfully in partner countries, offering a new approach to its agricultural development.



Senegalese women walking in the rice fields

“The USAID/ERA project, through the support it gives to agricultural research and training in Senegal, plays a very important role in the implementation of the Government of Senegal's policy in this area. I would like to express my complete satisfaction with this project. In addition to providing support in capacity building, logistics, and scientific and technical equipment, ERA has also provided institutional support that has transformed the universities, training centers, and agricultural research institutes of our country. On behalf of the Government of Senegal, I express my thanks to the United States of America for its continued support. I would like also to offer my sincere gratitude to the project's implementation team, headed by Virginia Tech, and to all of ERA's partners for their significant contribution to the achievement of our shared objectives.”- **Dr. Mary Teuw Niane, Minister of Higher Education, Research and Innovation, Senegal**

# 「CIRED at a glance」

**\$182.3 million**  
*total project funding*

**\$ 14.7 million**  
*returned overhead*

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**43** *countries worked in*

**37** *global sub-awards*

**77** *graduate students currently supported globally*

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**39** *academic partners in*

**17** *countries*





*Harvesting rice in Bangladesh*

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