



2019

STRATEGIC AND SUSTAINABILITY PLAN

Foundation for Food and Agriculture Research



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OVERVIEW

Research is crucial for maintaining a strong agricultural sector. Public and private agriculture research investments enable American farmers to be the most productive in the world, driving economic growth and stability. These research investments further ensure US competitiveness in agricultural export markets, and provide American consumers with safe, affordable food.

However, public investment in US agriculture research has slowed considerably, while other countries are scaling up research investments. For every US dollar allocated to public agriculture research in 2011, Brazil, India, and China invested \$2.35 – more than double the US. The US share of global public agricultural research spending has also fallen markedly; from 20.2 percent in 1960 to just 11.5 percent in 2011. Failure to invest in public agriculture research threatens US competitiveness.

FFAR was created in the Agricultural Act of 2014 to bring greater private investment to support public research addressing today's food and agriculture challenges (Appendix A: Agricultural Act of 2014). FFAR builds public-private

partnerships to match the \$200 million allocated in public investment and support innovative science that solves agriculture's most pressing challenges.

In the short period since its establishment, FFAR has achieved significant impact on research and development in the US food and agriculture sector. Currently, FFAR is leveraging \$1.25 dollars in private investment for every tax dollar allocated, multiplying the initial investment by hundreds of millions of dollars to complement US Department of Agriculture (USDA) research investments and help US agriculture thrive.

Owing to these successes, the Agricultural Improvement Act of 2018 appropriated an additional \$185 million to FFAR, with the request to develop a strategic plan describing a path for sustainability (Appendix B: Agricultural Improvement Act of 2018).

In February 2019, FFAR retained the Boston Consulting Group (BCG) to review FFAR's progress to date and develop a set of potential pathways that allow the Foundation to work toward financial sustainability and greater impact. The following report outlines these findings and articulates these plans.

PROJECT APPROACH

FFAR gathered input from a wide range of sources to answer three questions: key trends and challenges in the food and agriculture sector, FFAR's value proposition to stakeholders, and potential pathways for FFAR to achieve greater impact and financial sustainability. Through interviews or surveys of over 300 stakeholders, FFAR identified the impact of current strategies and the path needed to move forward.

Additionally, this effort reviewed other benchmark organizations' missions, programs, and business models to understand potential options and relevance for FFAR. This review focused on similar organizations including foundations affiliated with US federal agencies, such as the Foundation for the National

Institutes of Health (FNIH), the National Fish and Wildlife Foundation (NFWF); international research organizations such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia, TopSector Agri&Food and TiFN in the Netherlands; and other food and agriculture and sustainability-oriented organizations like World Business Council for Sustainable Development (WBCSD) (Appendix C - Approach and methodology).

This report outlines a pathway towards diversification that is consistent with FFAR's value proposition and cognizant of current trends in agriculture research as well as existing food and agriculture challenges.



FOOD AND AGRICULTURE RESEARCH CHALLENGES AND FUNDING TRENDS

FFAR's vision is "A world in which ever-innovating and collaborative science provides every person access to affordable, nutritious food grown on thriving farms."

In achieving this vision, transformative change in the food and agriculture system is required. The global and US food and agriculture systems must identify key research challenges and overcome funding trends. This report contains an overview of both food and agriculture research and development (R&D) challenges as well as funding trends.

The President's Council of Advisors on Science and Technology highlighted seven key challenges for US agriculture, which FFAR's Board of Directors and Advisory Councils agree are the most pressing research objective. FFAR's research focus currently aligns closely with these seven challenges and the

Foundation intends to continue in this direction (Appendix D – Detailed food & agriculture R&D landscape).

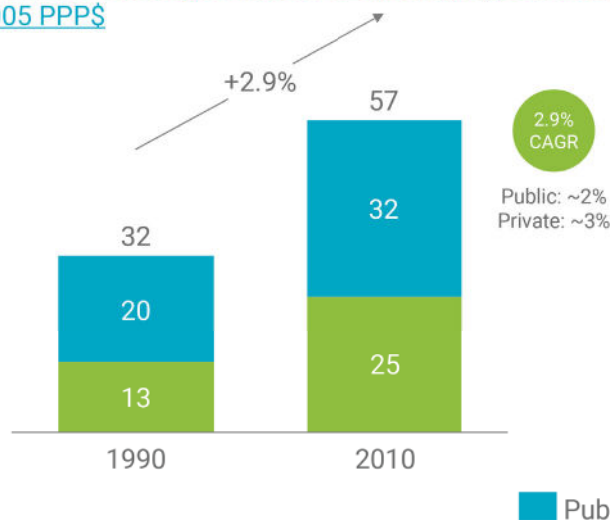
One key funding trend is the need for increased investment in food and agriculture research. As depicted in the below graphic, the US investment in food and agriculture research is slowing in comparison to the international and private sector investment.

Unless US investment in public agriculture research increases, the US risks losing its leadership in the food and agriculture sector and its status as the top producing country in the world.

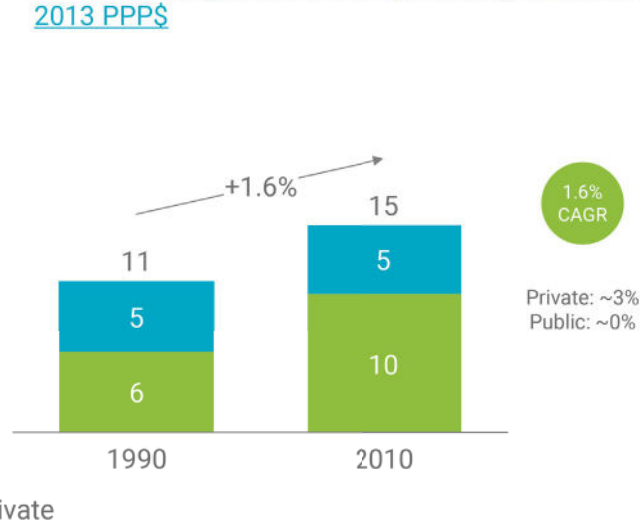
These trends and challenges are likely to have broad implications, underscoring the need for leveraging private investment and collaboration to create solutions (Appendix D – Detailed food & agriculture R&D landscape).

Global and US food and agriculture R&D spend, from 1990 to 2010.

Global food and agriculture R&D spend (\$B), constant 2005 PPP\$



US food and agriculture R&D spend (\$B), constant 2013 PPP\$



CAGR: Compound Annual Growth Rate; Note: Traditional food & agriculture R&D definition includes ag inputs (e.g., crop seeds, farm machinery, animal health) and food manufacturing (e.g., meat processing, dairy, fruits and vegetables). Does not include ag-/food-related R&D spending in other sectors, e.g., technology & health. Source: For global R&D numbers: Agricultural Science and Technology Indicators, Heisey and Fuglie (2016); For US R&D numbers: USDA Economic Research Service



KEY ASSESSMENT FINDINGS AND ORGANIZATIONAL MODELS EXPLORED

FFAR's value proposition lies in the Foundation's ability to leverage public dollars to mobilize private investment, form partnerships between public-private entities, identify and address important gaps in food and agriculture R&D, and facilitate the translation of research into impact.

Stakeholders believe that FFAR's success to date and value proposition is enabled by its Congressional mandate and funding, and that continued Congressional funding is essential to sustaining FFAR's scale of impact and ability to achieve its mission (Appendix E—Detailed findings from baseline assessment).

Specifically, over 80% of stakeholders believe that FFAR's Congressional funding is a critical component of FFAR's model and contributes significantly to FFAR's credibility and ability to make an impact in food and agriculture.

FFAR's Congressional funding allows it to bring partners to the table and serve as an independent, neutral third party. This enables FFAR to credibly convene and build partnerships and provides legitimacy to the research that it facilitates.

A review of similar organizational models such as FNIH, NFWF, CSIRO, and TIFN highlight several opportunities for FFAR to increase its impact and diversify its funding base. The review noted that many of these benchmark organizations do not have a singular business or funding model; rather, they pursue multiple models that maximize impact while creating a diverse and stable financial base. Based on this review, FFAR has identified several opportunities for diversification.

FFAR'S STRATEGY

FFAR refined its organizational strategy based on stakeholder input, exploration of research challenges, and funding trends. FFAR's more than 3,200 stakeholders were invited to provide input into this transformative path forward that addresses the needs and interests of the segments that make up the field.

This three-to-five-year strategic plan — adopted by FFAR's Board — focuses FFAR's efforts toward maximizing impact on complex issues facing food and agriculture systems of the future. The goals and objectives set an ambition for impact and will serve as guideposts on what FFAR will achieve.

The Foundation for Food and Agriculture Research was established by Congress in the Agricultural Act of 2014 to provide an innovative model for funding food and agriculture research.

VISION

The change FFAR aspires to create in the world.

FFAR envisions a world in which ever-innovating and collaborative science provides every person access to affordable, nutritious food grown on thriving farms.

MISSION

FFAR's unique role in creating that change.

FFAR creates unique public-private partnerships to generate and extend actionable science addressing today's food and agriculture challenges of national and international significance.

GOALS

The high-level descriptions of what FFAR must achieve to be successful.

GOAL 1: Build inclusive public-private partnerships to fund innovative food and agriculture research.

Impact Objectives - The specific ways in which FFAR will achieve research goals.

- Enhance the viability of farms and our food supply
- Increase environmental resilience
- Support conscientious stewardship of natural resources
- Improve human health and well-being through food and agriculture



GOAL 2: Serve as a leading voice representing food and agriculture research.

GOAL 3: Develop the scientific workforce for food and agriculture.

GOAL 4: Further FFAR by strengthening the core and achieving financial sustainability through expanding resources.

GOAL 5: Further FFAR's mission by honing a high-performing organizational culture and living our values.



FFAR'S VALUES

The core tenets that inform and infuse everything FFAR does

FFAR's is committed to building partnerships and catalyzing research that reflect our values.

Audacity

FFAR is an audacious organization that builds bold partnerships to fund intrepid research. The Foundation's unique model and resources allow it to think beyond existing constraints to tackle problems previously deemed intractable.

Collaboration

FFAR is committed to building public-private partnerships that provide an open, collaborative space to identify and develop solutions to food and agriculture's greatest challenges.

Rigor

FFAR is committed to a rigorous scientific review process that produces reliable and credible results benefitting the public and private sectors.

Pioneer

FFAR is pioneering scientific exploration, expanding the frontiers of food and agriculture research to initiate innovative, creative research in service of the greater good.

Agility

FFAR agilely approaches research and partnerships from multiple perspectives to identify connections across disciplines and opportunities for results that benefit multiple stakeholders.

RECOMMENDED PATHWAY TOWARD FINANCIAL SUSTAINABILITY

Stakeholders agree FFAR fills a unique niche that allows it to be independent and convene unusual and needed partners, who might otherwise fail to work toward common goals.

This strategic planning and sustainability exploration demonstrates that FFAR requires Congressional funding to remain relevant, viable, to maintain velocity, and increase impact toward conquering the food and agriculture challenges of this time.

Congressional funding provides a draw to partners who might not otherwise invest in food and agriculture research; it allows FFAR to focus on much-needed innovation in research gaps that others would not be motivated to fill and the funding is impetus for collaboration when research is typically done piecemeal.

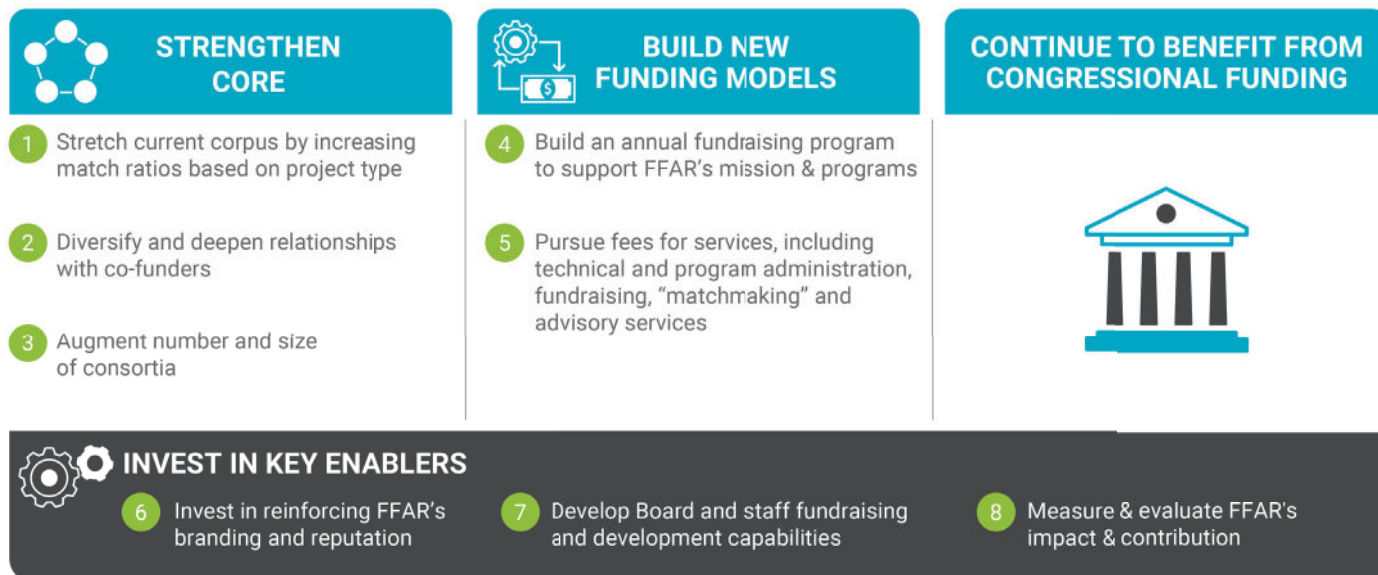
FFAR will pursue initiatives to strengthen its core and build new funding models for diversification, which will be possible with continued Congressional funding (Appendix F - Detailed pathway towards financial sustainability).

In the past several years, FFAR has made grants at a rate of ~\$30-50M per year, which have then been matched for a total of \$60-100M in research impact per year. In support of Congress' vision and mandate for FFAR, the Foundation aspires to deliver, within ten years, a \$2 match from non-federal sources for each taxpayer dollar. Assuming continued public funding at today's levels, FFAR's total research impact would be well over \$150M per year by 2030.

To achieve this goal, FFAR has outlined a sustainability plan, which includes initiatives across four pillars:

1. **Strengthen FFAR's core model:** increase leverage and impact of Congressional funding.
2. **Build new funding models:** scale FFAR's model for even greater impact and establish a strong, diversified funding base.
3. **Continue to benefit from Congressional funding:** maintain FFAR's credibility and independence and provide even greater leverage to taxpayer dollars.
4. **Invest in key enablers:** build new capabilities, models, and capacity to execute on strengthening the core.

FFAR's pathway to financial sustainability

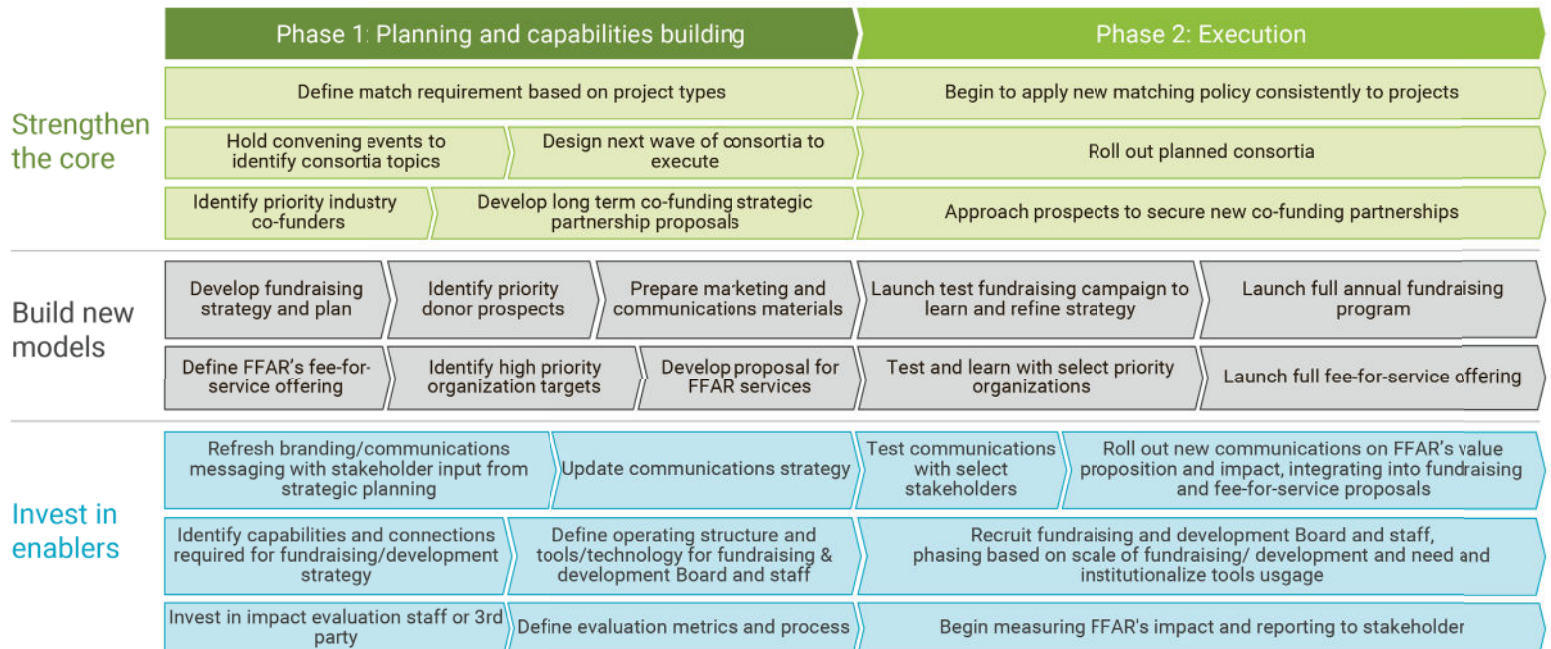




ROADMAP AHEAD

Below is a high-level roadmap for executing the sustainability plan for diversification outlined above.

Roadmap for FFAR's pathway to financial sustainability



The roadmap is structured in two phases – a planning and capabilities building phase followed by an execution phase. However, a highly iterative and “test and learn” approach is anticipated, particularly as new models are explored and built.

“Congressional funding gives FFAR legitimacy...being able to say that the US government cares about these issues, is funding this innovative program – there’s a narrative you can build from that.”

— FFAR Stakeholder

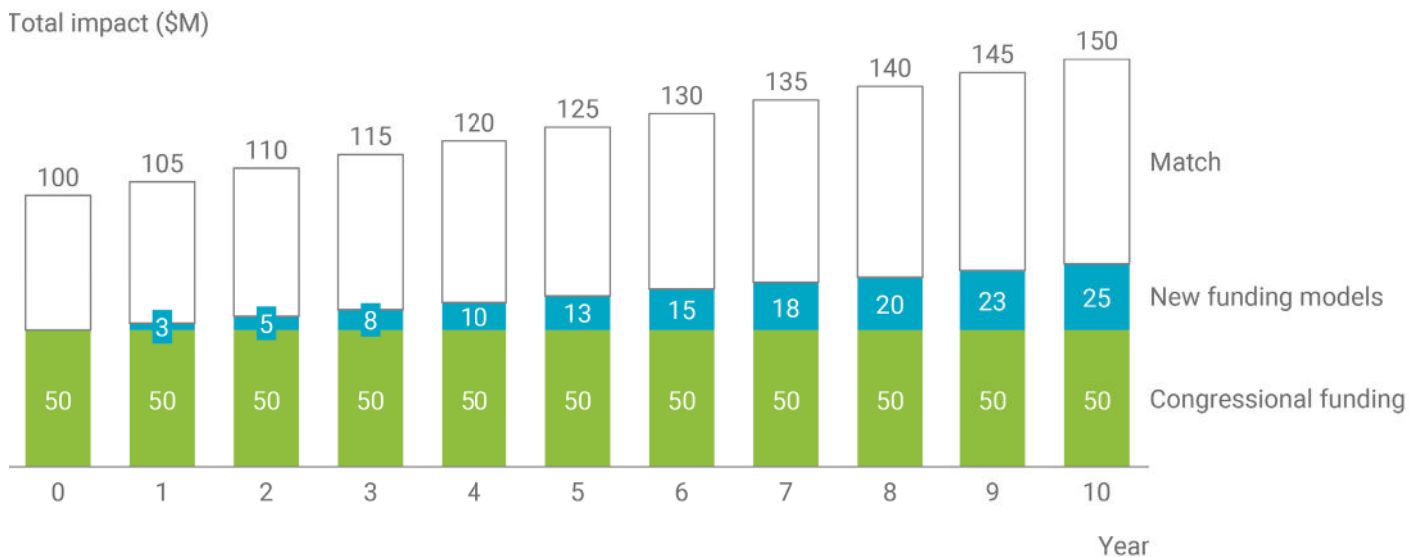


FINANCIAL GOALS

This section outlines a ten-year projection of FFAR’s annual budget, including Congressional funding, private funding, and additional matching funding for both public and private funding pools. The projections represent annual targets as progress is made toward matching \$2 from non-federal sources for each federal dollar. FFAR aims to award at least \$150 million annually in 10 years. Increased taxpayer funding would bring a commensurate increase to the financial goals.

This sample scenario assumes continued Congressional funding at ~\$50M per year, representing at least \$200M in Farm Bill funding over four years, complemented by \$25M of funding from new models. The public corpus is an essential part of FFAR’s funding model and is critical to its ability to fulfill the Congressional mandate (Appendix G – Detailed financial considerations).

Financial projections with continued Congressional funding at current levels + \$25M new funding models + 1:1 match on public and private funds.





FFAR'S TRANSPARENCY INITIATIVES

The 2018 Farm Bill requested FFAR describe efforts to be transparent in each of the Foundation's processes:

- Processes relating to grant awards, including the selection, review, and notification processes (Appendix H – FFAR grant award processes);
- Communication of past, current, and future research priorities (Appendix I – FFAR research priorities); and
- Responding to public input (Appendix J – Engaging the public).

FFAR strives to maintain transparency for all the Foundation's work. Per federal requirements, FFAR is adding a Stakeholder Notice to the FFAR webpage starting in September 2019. The notice will include a schedule of funding opportunities, information about how grant applications are evaluated and a discussion of how FFAR will communicate funded awards publicly to ensure grantees and partners understand the Foundation's objectives.

CONCLUSION

Developing this strategic plan has helped FFAR identify its unique value proposition for addressing critical challenges in food and agriculture research. The solutions to these challenges require collective action and collaboration across the public, private, and social sectors. FFAR has a successful history of mobilizing private investment and building unique partnerships to identify and develop solutions to these critical challenges.

Solving these challenges also requires significant funding. This report outlines FFAR's financial goals for the next 10 years and proposes a plan to diversify funding strategies to achieve this goal. The Foundation proposes a pathway towards financial diversification and sustainability. FFAR aspires to provide greater leverage to taxpayer dollars while expanding leadership in and impact on food and agriculture research.

The investment in FFAR to solve agriculture's most pressing challenges is also essential for maintaining US leadership and competitiveness. Without further investment in agriculture research, it will become harder for America's farmers and ranchers to maintain production levels and compete in international markets.

This will in turn create greater food access challenges and strain existing food systems. It is imperative that both the public and private sectors continue to invest in food and agriculture research to maintain US agricultural leadership and production.

Finally, FFAR's critical mission requires a stable, predictable funding base. While it seems possible to expand overall resources for food and agriculture research, it is also vitally important to ensure at least some component of this funding is dependable. Thus, FFAR should be considered as a baseline budget item in future Farm Bills.

FFAR produces actionable research that is essential to farmers and ranchers in the US and around the world. The Foundation is only starting to realize its full potential. FFAR is confident that through its partnerships, and continued Congressional funding, it can use collaborative science to provide every person access to affordable, nutritious food grown on thriving farms. The Foundation further remains hopeful that Congress will continue to support FFAR in its critical mission.

APPENDIX A – AGRICULTURAL ACT OF 2014

The Foundation for Food and Agriculture Research was established by Congress in the Agricultural Act of 2014, also known as the Farm Bill. Read the legislative language stating FFAR's purpose and duties below:

H. R. 2642: Agricultural Act of 2014

Subtitle F—Miscellaneous Provisions SEC. 7601. FOUNDATION FOR FOOD AND AGRICULTURE RESEARCH.

(a) DEFINITIONS.—In this section:

- (1) BOARD.—The term “Board” means the Board of Directors described in subsection (e). H. R. 2642—257
- (2) DEPARTMENT.—The term “Department” means the Department of Agriculture.
- (3) FOUNDATION.—The term “Foundation” means the Foundation for Food and Agriculture Research established under subsection (b).
- (4) SECRETARY.—The term “Secretary” means the Secretary of Agriculture.

(b) ESTABLISHMENT.—

- (1) IN GENERAL.—The Secretary shall establish a nonprofit corporation to be known as the “Foundation for Food and Agriculture Research”.
- (2) STATUS.—The Foundation shall not be an agency or instrumentality of the United States Government.

(c) PURPOSES.—The purposes of the Foundation shall be—

- (1) to advance the research mission of the Department by supporting agricultural research activities focused on addressing key problems of national and international significance including—
 - (A) plant health, production, and plant products;
 - (B) animal health, production, and products;
 - (C) food safety, nutrition, and health;
 - (D) renewable energy, natural resources, and the environment;
 - (E) agricultural and food security;
 - (F) agriculture systems and technology; and
 - (G) agriculture economics and rural communities; and
- (2) to foster collaboration with agricultural researchers from the Federal Government, State (as defined in section 1404 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3103)) governments, institutions of higher education (as defined in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001)), industry, and nonprofit organizations.

(d) DUTIES.—

- (1) IN GENERAL.—The Foundation shall—
 - (A) award grants to, or enter into contracts, memoranda of understanding, or cooperative agreements with, scientists and entities, which may include agricultural research agencies in the Department, university consortia, public-private partnerships, institutions of higher education, nonprofit organizations, and industry, to efficiently and effectively advance the goals and priorities of the Foundation;

(B) in consultation with the Secretary—

- (i) identify existing and proposed Federal intramural and extramural research and development programs relating to the purposes of the Foundation described in subsection (c); and
- (ii) coordinate Foundation activities with those programs so as to minimize duplication of existing efforts and to avoid conflicts;

(C) identify unmet and emerging agricultural research needs after reviewing the roadmap for agricultural research, education, and extension authorized by section 7504 of the Food, Conservation, and Energy Act of 2008 (7 U.S.C. 7614a); H. R. 2642—258

(D) facilitate technology transfer and release of information and data gathered from the activities of the Foundation to the agricultural research community;

(E) promote and encourage the development of the next generation of agricultural research scientists; and

(F) carry out such other activities as the Board determines to be consistent with the purposes of the Foundation.

(e) BOARD OF DIRECTORS.—

(1) ESTABLISHMENT.—The Foundation shall be governed by a Board of Directors.

(2) COMPOSITION.—

(A) IN GENERAL.—The Board shall be composed of appointed and ex-officio, nonvoting members.

(B) EX-OFFICIO MEMBERS.—The ex-officio members of the Board shall be the following individuals or designees of such individuals:

- (i) The Secretary.
- (ii) The Under Secretary of Agriculture for Research, Education, and Economics.
- (iii) The Administrator of the Agricultural Research Service.
- (iv) The Director of the National Institute of Food and Agriculture.
- (v) The Director of the National Science Foundation.

(C) APPOINTED MEMBERS.—

(i) IN GENERAL.—The ex-officio members of the Board (as specified in subparagraph (B)) shall, by majority vote, appoint to the Board 15 individuals, of whom—

- (I) 8 shall be selected from a list of candidates to be provided by the National Academy of Sciences; and
- (II) 7 shall be selected from lists of candidates provided by industry.

(ii) REQUIREMENTS.—

(I) EXPERTISE.—The ex-officio members shall ensure that a majority of the appointed members of the Board have actual experience in agricultural research and, to the extent practicable, represent diverse sectors of agriculture.

(II) LIMITATION.—No employee of the Federal Government may serve as an appointed member of the Board under this subparagraph.

(III) NOT FEDERAL EMPLOYMENT.—Appointment to the Board under this subparagraph shall not constitute Federal employment.

(iii) AUTHORITY.—All appointed members of the board shall be voting members.

(D) CHAIR.—The Board shall, from among the members of the Board, designate an individual to serve as Chair of the Board.

(3) INITIAL MEETING.—Not later than 60 days after the date of enactment of this Act, the Secretary shall convene a meeting of the ex-officio members of the Board—

(A) to incorporate the Foundation; and

(B) to appoint the members of the Board in accordance with paragraph (2)(C)(i).

(4) DUTIES.—

(A) IN GENERAL.—The Board shall—

(i) establish bylaws for the Foundation that, at a minimum, include—

(I) policies for the selection of future Board members, officers, employees, agents, and contractors of the Foundation;

(II) policies, including ethical standards, for—

(aa) the acceptance, solicitation, and disposition of donations and grants to the Foundation; and

(bb) the disposition of assets of the Foundation, including appropriate limits on the ability of donors to designate, by stipulation or restriction, the use or recipient of donated funds;

(III) policies that would subject all employees, fellows, trainees, and other agents of the Foundation (including members of the Board) to conflict of interest standards in the same manner as Federal employees are subject to the conflict of interest standards under section 208 of title 18, United States Code;

(IV) policies for writing, editing, printing, publishing, and vending of books and other materials;

(V) policies for the conduct of the general operations of the Foundation, including a cap on administrative expenses for recipients of a grant, contract, or cooperative agreement from the Foundation; and

(VI) specific duties for the Executive Director;

(ii) prioritize and provide overall direction for the activities of the Foundation;

(iii) evaluate the performance of the Executive Director; and

(iv) carry out any other necessary activities regarding the Foundation.

(B) ESTABLISHMENT OF BYLAWS.—In establishing bylaws under subparagraph (A)(i), the Board shall ensure that the bylaws do not—

(i) reflect unfavorably on the ability of the Foundation to carry out the duties of the Foundation in a fair and objective manner; or

(ii) compromise, or appear to compromise, the integrity of any governmental agency or program, or any officer or employee employed by, or involved in, a governmental agency or program.

(5) TERMS AND VACANCIES.—

(A) TERMS.—

(i) IN GENERAL.—The term of each member of the Board appointed under paragraph (2)(C) shall be 5 years, except that of the members initially appointed, 8 of the members shall each be appointed for a term of 3 years and 7 of the members shall each be appointed for a term of 2 years.

(ii) PARTIAL TERMS.—If a member of the Board does not serve the full term applicable under clause (i), the individual appointed to fill the resulting vacancy shall be appointed for the remainder of the term of the predecessor of the individual.

(iii) TRANSITION.—A member of the Board may continue to serve after the expiration of the term of the member until a successor is appointed.

(B) VACANCIES.—After the initial appointment of the members of the Board under paragraph (2)(C), any vacancy in the membership of the Board shall be filled as provided in the bylaws established under paragraph (4)(A)(i).

(6) COMPENSATION.—Members of the Board may not receive compensation for service on the Board but may be reimbursed for travel, subsistence, and other necessary expenses incurred in carrying out the duties of the Board.

(7) MEETINGS AND QUORUM.—A majority of the members of the Board shall constitute a quorum for purposes of conducting the business of the Board.

(f) ADMINISTRATION.—

(1) EXECUTIVE DIRECTOR.—

(A) IN GENERAL.—The Board shall hire an Executive Director who shall carry out such duties and responsibilities as the Board may prescribe.

(B) SERVICE.—The Executive Director shall serve at the pleasure of the Board.

(2) ADMINISTRATIVE POWERS.—

(A) IN GENERAL.—In carrying out this section, the Board, acting through the Executive Director, may—

- (i) adopt, alter, and use a corporate seal, which shall be judicially noticed;
- (ii) hire, promote, compensate, and discharge 1 or more officers, employees, and agents, as may be necessary, and define the duties of the officers, employees, and agents;
- (iii) solicit and accept any funds, gifts, grants, devises, or bequests of real or personal property made to the Foundation, including such support from private entities;
- (iv) prescribe the manner in which—
 - (I) real or personal property of the Foundation is acquired, held, and transferred;
 - (II) general operations of the Foundation are to be conducted; and
 - (III) the privileges granted to the Board by law are exercised and enjoyed;
- (v) with the consent of the applicable executive department or independent agency, use the information, services, and facilities of the department or agency in carrying out this section on a reimbursable basis;
- (vi) enter into contracts with public and private organizations for the writing, editing, printing, and publishing of books and other material;
- (vii) hold, administer, invest, and spend any funds, gifts, grant, devise, or bequest of real or personal property made to the Foundation;
- (viii) enter into such contracts, leases, cooperative agreements, and other transactions as the Board considers appropriate to conduct the activities of the Foundation;
- (ix) modify or consent to the modification of any contract or agreement to which the Foundation is a party or in which the Foundation has an interest;
- (x) take such action as may be necessary to obtain and maintain patents for and to license inventions (as defined in section 201 of title 35, United States Code) developed by the Foundation, employees of the Foundation, or derived from the collaborative efforts of the Foundation;
- (xi) sue and be sued in the corporate name of the Foundation, and complain and defend in courts of competent jurisdiction;
- (xii) appoint other groups of advisors as may be determined necessary to carry out the functions of the Foundation; and

(xiii) exercise such other incidental powers as are necessary to carry out the duties and functions of the Foundation in accordance with this section.

(B) LIMITATION.—No appointed member of the Board or officer or employee of the Foundation or of any program established by the Foundation (other than ex-officio members of the Board) shall exercise administrative control over any Federal employee.

(3) RECORDS.—

(A) AUDITS.—The Foundation shall—

- (i) provide for annual audits of the financial condition of the Foundation; and
- (ii) make the audits, and all other records, documents, and other papers of the Foundation, available to the Secretary and the Comptroller General of the United States for examination or audit.

(B) REPORTS.—

(i) ANNUAL REPORT ON FOUNDATION.—

(I) IN GENERAL.—Not later than 5 months following the end of each fiscal year, the Foundation shall publish a report for the preceding fiscal year that includes—

- (aa) a description of Foundation activities, including accomplishments; and
- (bb) a comprehensive statement of the operations and financial condition of the Foundation.

(II) FINANCIAL CONDITION.—Each report under subclause (I) shall include a description of all gifts, grants, devises, or bequests to the Foundation of real or personal property or money, which shall include—

- (aa) the source of the gifts, grants, devises, or bequests; and
- (bb) any restrictions on the purposes for which the gift, grant, devise, or bequest may be used.

(III) AVAILABILITY.—The Foundation shall—

- (aa) make copies of each report submitted under subclause (I) available for public inspection; and
- (bb) on request, provide a copy of the report to any individual.

(IV) PUBLIC MEETING.—The Board shall hold an annual public meeting to summarize the activities of the Foundation.

(ii) GRANT REPORTING.—Any recipient of a grant under subsection (d)(1)(A) shall provide the Foundation with a report at the conclusion of any research or studies conducted that describes the results of the research or studies, including any data generated.

(4) INTEGRITY.—

(A) IN GENERAL.—To ensure integrity in the operations of the Foundation, the Board shall develop and enforce procedures relating to standards of conduct, financial disclosure statements, conflicts of interest (including recusal and waiver rules), audits, and any other matters determined appropriate by the Board.

(B) FINANCIAL CONFLICTS OF INTEREST.—Any individual who is an officer, employee, or member of the Board is prohibited from any participation in deliberations by the Foundation of a matter that would directly or predictably affect any financial interest of—

- (i) the individual;
- (ii) a relative (as defined in section 109 of the Ethics in Government Act of 1978 (5 U.S.C. App.)) of that individual; or
- (iii) a business organization or other entity in which the individual has an interest, including an organization or other entity with which the individual is negotiating employment.

(5) INTELLECTUAL PROPERTY.—The Board shall adopt written standards to govern the ownership and licensing of any intellectual property rights derived from the collaborative efforts of the Foundation.

(6) LIABILITY.—The United States shall not be liable for any debts, defaults, acts, or omissions of the Foundation nor shall the full faith and credit of the United States extend to any obligations of the Foundation.

(g) FUNDS.—

(1) MANDATORY FUNDING.—

(A) IN GENERAL.—On the date of the enactment of this Act, of the funds of the Commodity Credit Corporation, the Secretary shall transfer to the Foundation to carry out this section \$200,000,000, to remain available until expended under the conditions described in subparagraph (B).

(B) CONDITIONS ON EXPENDITURE.—The Foundation may use the funds made available under subparagraph (A) to carry out the purposes of the Foundation only to the extent that the Foundation secures an equal amount of non-Federal matching funds for each expenditure.

(C) PROHIBITION ON CONSTRUCTION.—None of the funds made available under subparagraph (A) may be used for construction.

(2) SEPARATION OF FUNDS.—The Executive Director shall ensure that any funds received under paragraph (1) are held in separate accounts from funds received from nongovernmental entities as described in subsection (f)(2)(A)(iii).

APPENDIX B – AGRICULTURAL IMPROVEMENT ACT OF 2018

SEC. 7603. FOUNDATION FOR FOOD AND AGRICULTURE RESEARCH.

Section 7601 of the Agricultural Act of 2014 (7 U.S.C. 5939) is amended--

- (1) in subsection (d)(1)--
 - (A) in subparagraph (B)--
 - (i) in clause (ii), by striking "conflicts;" and inserting "conflicts, specifically at the Department of Agriculture; and"; and
 - (ii) by adding at the end the following new clause:
 - "(iii) document the consultation process and include a summary of the results in the annual report required in subsection (f)(3)(B)"; and
 - (B) in subparagraph (D), by inserting "and agriculture stakeholders" after "community";
 - (2) in subsection (e)--
 - (A) in paragraph (2)(C)(ii)(I), by inserting "agriculture or" before "agricultural research"; and
 - (B) in paragraph (4)(A)--
 - (i) in clause (iii), by striking "and" at the end;
 - (ii) by redesignating clause (iv) as clause (v); and
 - (iii) by inserting after clause (iii) the following:
 - "(iv) actively solicit and accept funds, gifts, grants, devises, or bequests of real or personal property made to the Foundation, including from private entities; and";
 - (3) in subsection (f)--
 - (A) in paragraph (2)(A)(iii), by striking "any"; and
 - (B) in paragraph (3)(B)--
 - (i) in clause (i)(I)--
 - (I) in the matter preceding item (aa), by inserting "and post online" before "a report";
 - (II) in item (aa), by striking "accomplishments; and" and inserting "accomplishments and how those activities align to the challenges identified in the strategic plan under clause (iv)";
 - (III) in item (bb), by striking the period at the end and inserting "; and"; and
 - (IV) by adding at the end the following: "(cc) a description of available agricultural research programs and priorities for the upcoming fiscal year."; and
 - (ii) by adding at the end the following:
 - "(iii) Stakeholder notice.--The Foundation shall publish an annual notice with a description of agricultural research priorities under this section for the upcoming fiscal year, including--
 - "(I) a schedule for funding competitions;
 - "(II) a discussion of how applications for funding will be evaluated; and
 - "(III) how the Foundation will communicate information about funded awards to the public to ensure that grantees and partners understand the objectives of the Foundation.
 - "(iv) Strategic plan.--Not later than 1 year after the date of enactment of the Agriculture Improvement Act of 2018, the Foundation shall submit to the Committee on Agriculture of the House of Representatives and the Committee on Agriculture, Nutrition, and Forestry of the Senate a strategic plan describing a path for the Foundation to become self-sustaining, including--
 - "(I) a forecast of major agricultural challenge opportunities identified by the scientific advisory councils of the Foundation and approved by the Board, including short- and long-term objectives;

- “(II) an overview of the efforts that the Foundation will take to be transparent in each of the processes of the Foundation, including--
 - “(aa) processes relating to grant awards, including the selection, review, and notification processes;
 - “(bb) communication of past, current, and future research priorities; and
 - “(cc) plans to solicit and respond to public input on the opportunities identified in the strategic plan;
 - “(III) a description of financial goals and benchmarks for the next 10 years, including a detailed plan for--
 - “(aa) raising funds in amounts greater than the amounts required under subsection (g)(1)(B);
 - “(bb) soliciting additional resources pursuant to subsections (e)(4)(A)(iv) and (f)(2)(A)(iii); and
 - “(cc) managing and leveraging such resources pursuant to subsection (f)(2)(A)(vii); and
 - “(IV) other related issues, as determined by the Board.”; and
- (4) in subsection (g)(1)--
- (A) in the paragraph heading, by striking “Mandatory funding” and inserting “Funding”;
 - (B) in subparagraph (A)--
 - (i) by striking “On the date” and inserting the following:
 - “(i) Establishment funding.--On the date”; and
 - (ii) by adding at the end the following:
 - “(ii) Enhanced funding.--On the date on which the strategic plan described in subsection (f)(3)(B)(iv) is submitted, of the funds of the Commodity Credit Corporation, the Secretary shall transfer to the Foundation to carry out this section \$185,000,000, to remain available until expended.”; and
 - (C) in subparagraph (B)--
 - (i) by striking “The Foundation” and inserting the following:
 - “(i) In general.--The Foundation”;
 - (ii) in clause (i) (as so designated)--
 - (I) by striking “purposes” and inserting “purposes, duties, and powers”; and
 - (II) by striking “non-Federal matching funds for each expenditure” and inserting “matching funds from a non-Federal source, including an agricultural commodity promotion, research, and information program”; and
 - (iii) by adding at the end the following:
 - “(ii) Effect.--Nothing in this section requires the Foundation to require a matching contribution from an individual grantee as a condition of receiving a grant under this section.”

APPENDIX C - APPROACH & METHODOLOGY

In February 2019, FFAR engaged the Boston Consulting Group (BCG) to conduct a baseline assessment and develop a financial sustainability plan. BCG structured their assessment around three key questions:

1. What are **key trends & challenges** in the food & agriculture sector?
2. What is **FFAR's value proposition** to its stakeholders? In other words, what are FFAR's strengths and comparative advantages, and how do those match stakeholder needs?
3. What are the **potential pathways for FFAR to achieve greater impact and financial sustainability** in line with its mission to address today's food & agriculture challenges?

To answer these questions, BCG gathered input from a wide range of sources, including:

Interviews with over 60 stakeholders and food & agriculture experts, representing FFAR's grantees, funding partners, Board members, and other key stakeholders across sectors including government, foundations, industry, and academia. The interviews covered: food & agriculture R&D trends and challenges, FFAR's value proposition and performance, and opportunities for greater impact and financial sustainability.

Surveys of FFAR's stakeholders with 238 responses, also representing FFAR's grantees, funding partners, Board members, and other key stakeholders. The survey covered topics including FFAR's value proposition and performance, FFAR's business and funding models, and stakeholder R&D investment priorities and challenges.

Analysis of FFAR's programs and grant portfolio to understand distribution of project type, size, grantees, and funding partners.

Analysis of over 20 benchmark organizations with relevance for FFAR, including foundations affiliated with US federal agencies (e.g., FNIH, NFWF), international research organizations (e.g., CSIRO in Australia, TopSector Agri&Food and TiFN in the Netherlands), and other food & agriculture and sustainability-oriented organizations (e.g., WBCSD). As part of the benchmarking, BCG analyzed each organization's mission, programs, and business models to understand potential options and pathways for FFAR.

Literature review and analysis of food & agriculture R&D trends, challenges, and funding landscape, drawing on publications from the USDA-ERS, FAO, EAT-Lancet, Pardey et. al 2013, 2016, 2019.¹ BCG synthesized US and global food & agriculture trends and challenges to inform FFAR's value proposition, and analyzed the funding landscape to identify relevant segments, topics, and opportunities in line with FFAR's mission.

Throughout their engagement, BCG facilitated **regular working sessions** with FFAR management and the Board to share the findings of their analysis and to develop and assess different pathways for FFAR to achieve greater impact and financial sustainability. This document reflects the findings and recommendations that emerged from these inputs and discussions.

¹ A full bibliography is available in the Appendix.

Inputs to this effort.

Input from
FFAR Board & Staff

- 11 Board interviews, 19 survey responses
- Discussions with FFAR staff members
- Bi-weekly working sessions with management
- 2 Executive Committee updates
- 1 All-Board, All-Staff update

Group	Target	Delivered	Scheduled	Completed	Total
Board/Staff	11	11	11	11	44
Executive Committee	2	2	2	2	10
Advisory Board	1	1	1	1	5
Stakeholder	19	19	19	19	76
Survey	19	19	19	19	76
Interview	11	11	11	11	44
Update	3	3	3	3	12
Total	55	55	55	55	221

Input from Stakeholders &
Food & agriculture experts

- 219 stakeholder survey respondents, including co-funders and grantees
- ~60 stakeholder & expert interviews



Literature review

- From wide variety of sources, e.g.,
 - USDA-ERS reports, PCAST report, EAT-LANCET report, FAO report
 - Pardey et. al 2013, 2016, 2019
 - Expert interviews

Benchmarks of
business models

- Deep dives on 5 organizations representing a range of models relevant for FFAR
- Scan of ~20 organizations, including US federal agency foundations, international research orgs, food & ag organizations



BCG BACKGROUND

Founded in 1963, BCG is a leading global management consulting firm with over 90 offices in 50 countries. BCG has extensive experience serving leading companies and organizations across the private, public, and social sectors, including in Agriculture, Food Manufacturing, Retail, US Federal government, and numerous foundations and non-profits. BCG partners with its clients around the world to identify their highest-value opportunities, address their most critical challenges, and transform their organizations.

APPENDIX D – DETAILED FOOD & AGRICULTURE R&D LANDSCAPE

This section outlines key trends and challenges facing global and US food & agriculture systems and provides an overview of the food and agriculture R&D landscape. Over time, much progress has been made – hunger and poverty have declined, while technological innovations continue to drive agricultural productivity. However, many challenges remain. Our assessment of the prevailing trends and challenges suggests that, to realize FFAR’s vision, transformative change in the food and agriculture system is required.

KEY FOOD & AGRICULTURE CHALLENGES

In 2012, the President’s Council of Advisors on Science and Technology highlighted seven key challenges to United States agriculture². The relevance of these trends and challenges has been reinforced in recent literature, including the 2017 FAO report on “The Future of Food and Agriculture: Trends and Challenges” and the 2019 EAT-LANCET report on “Food in the Anthropocene: the EAT–Lancet Commission on Healthy Diets from Sustainable Food Systems.”

The **challenges** outlined by the President’s Council include:

- **Assisting with global food security and maintaining abundant yields** – The global population is predicted to reach 10 billion by 2050, and agriculture in 2050 will have to produce 50% more food, fuel and biofuel than it did in 2012³. Currently, 13% of low and middle income countries’ populations do not consume enough food to meet minimum dietary requirements.⁴ Substantial improvements in resource-use efficiency and resource conservation will need to be achieved globally to sustainably meet growing food demand. According to the FAO, “Investments in agriculture, fishery and forestry, and spending on research and development need to be stepped up” to counter these trends.⁵ The US currently produces more food than is needed for its population, it also has a strategic and security interest in maintaining a strong global food market.⁶
- **Producing safe and nutritious food** – The “triple burden” of malnutrition remains a global health emergency, consisting of undernutrition, micronutrient deficiencies (declining globally, but still highly prevalent in the developing world) and overweight and obesity (increasing worldwide, particularly in developed countries).⁷ In the United States, the rise in real incomes mean most Americans are changing their food choices to include higher value foods and organic foods.⁸ Governments and industry are trying to respond to the increasing complexity of consumer demands, with simultaneous and contradictory demand for natural foods and scientifically modified wellness additives,⁹ in an increasingly complex regulatory landscape.
- **Managing new pests, pathogens, and invasive plants** – For crops, weeds with resistance to conventional herbicides are a threat to high yields, while for animals, biosecurity and food safety remain key concerns for

² President’s Council of Advisors on Science and Technology, *Report to the President on Agricultural Preparedness and the Agricultural Research Enterprise* (Washington, DC: Executive Office of the President, 2012), v.

³ FAO, 46.

⁴ FAO, 76.

⁵ FAO, 136.

⁶ President’s Council, 16.

⁷ FAO, 80 – 84.

⁸ Council of Economic Advisors, *2013 Economic Report to the President* (Washington, DC: Council of Economic Advisors, 2013), 246.

⁹ Roman, S., Sanchez-Siles, L.M., Siegrist, M., “The importance of food naturalness for customers: Results of a systematic review,” *Trends in Food Science & Technology* 67 (September 2017): 44 – 57.

the United States.¹⁰ Moreover, risks to crops and livestock are growing with globalization, as more agricultural products move across international borders, and as animal production systems become more intensive.¹¹

- **Increasing the efficiency of water use** – Agriculture accounts for 80% of the US overall water consumption. In regions facing high population growth, such as the American Southwest, water is diverted away from agriculture towards meeting the needs of urban communities. Agriculture production must therefore improve its water use efficiency.¹²
- **Managing the production of bioenergy** – Over the last decade, the United States has seen a huge expansion in domestic biofuel production, although there is growing concern that use of arable land for biofuels competes with food production.¹³ Globally, there is increasing recognition that bioenergy is highly resource-intensive with environmental implications.¹⁴
- **Reducing the environmental footprint of agriculture** – Agriculture accounts for 10% of all US greenhouse gas emissions.¹⁵ Over the past 50 years, greenhouse gas emissions resulting from 'Agriculture, Forestry and Other Land Use' have nearly doubled, and projections suggest a further increase by 2050.¹⁶ According to the FAO, "charting environmentally sustainable pathways for agricultural development has a central role to play in mitigating climate change."¹⁷
- **Growing food in a changing climate** – Rising temperatures above critical levels, increasing variability of precipitation and increases in the frequency of droughts and floods are likely to reduce yields¹⁸, while climate change also changes the life cycle and range of pests and pathogens.¹⁹ However, increases in the frequency and severity of extreme climate events, such as heat waves, droughts, floods, tropical storms and wildfires, will have greater consequences on agricultural production and food insecurity than higher temperatures and more erratic rainfall.²⁰

To address these challenges, FFAR will need greater innovation and multi-stakeholder collaboration across government and industry actors. FFAR is well-positioned and has a growing track record of building partnerships and funding innovative science to address these needs.

¹⁰ President's Council, 8.

¹¹ Food and Agriculture Organization of the United Nations (FAO), *The Future of Food and Agriculture: Trends and Challenges* (Rome: FAO, 2017), 56.

¹² President's Council, 9.

¹³ Ibid, 13.

¹⁴ FAO, 32; Hoel, M., "The Rise and Fall of Bioenergy" (April 16, 2018), CESifo Working Paper Series No. 6971.

¹⁵ Marshall, E., "Agriculture and Climate Change," *USDA – ERS*, October 29, 2018, <https://www.ers.usda.gov/topics/natural-resources-environment/climate-change/agriculture-and-climate-change/>

¹⁶ Tubiello, F. N., Salvatore, M., Ferrara, A. F., House, J., Federici, S., Rossi, S., Biancalani, R., Condor Golec, R. D., Jacobs, H., Flammini, A., Prosperi, P., Cardenas-Galindo, P., Schmidhuber, J., Sanz Sanchez, M. J., Srivastava, N. and Smith, P., "The Contribution of Agriculture, Forestry and other Land Use activities to Global Warming, 1990–2012." *Global Change Biology*, 21 (2015): 2655-2660. doi:10.1111/gcb.12865

¹⁷ FAO, 39.

¹⁸ Ibid, 41.

¹⁹ President's Council, 12.

²⁰ FAO, 43.

FOOD & AGRICULTURE R&D FUNDING TRENDS

Global funding for food & agriculture R&D is increasing to meet the challenges in food & agriculture, driven in large part by increases in public spending from countries such as China and Brazil. From 1990 to 2010, spending on global food & agriculture R&D grew by 2.9% per year. Of the estimated \$57 billion, public spend accounts for ~56%.²¹ This growth has been primarily driven by countries such as China and Brazil: from 2005 to 2013, public food & agriculture R&D spend grew by 12% and 6% per year, respectively,²² driven by food security concerns and interest in improving agricultural productivity.²³

In contrast, US food & agriculture R&D spend is increasing at only half the global rate, driven primarily by a decline in US public funding. From 1990 to 2010, US food & agriculture R&D grew at only 1.6% per year - half the global rate of 2.9%.²⁴ This has primarily been driven by trends in public funding. From 2005 to 2013, US public R&D spend fell by 3% per year, and was overtaken by China in 2008.²⁵ Among major players, the US has the lowest proportion of public spend as a percentage of total agriculture GDP at 1.0%, while Asia Pacific and Western Europe are at 4.4% and 4.8% respectively.²⁶ State level expenditures began falling in 1991, initially offset by an increase in non-USDA federal agency spend on agriculture. However, USDA budgets began to decline in 2001, and by 2009 US public spending for agriculture R&D fell at an accelerated rate.²⁷

At the same time, US private sector R&D investment has accelerated to keep pace with overall global growth. In the same period (1990 to 2010), US private sector R&D spending has accelerated at 3% per year, in line with overall global growth.²⁸ This growth has been driven by strengthened intellectual property rights for private research (e.g. Bayh-Dole), new commercial opportunities (e.g., genetically modified crops), economies of scale from consolidation in the agricultural input markets, and increasing demand from developing markets.²⁹ However, this private sector investment has not necessarily tackled the same issues and challenges as public funding.³⁰ These trends are likely to have implications for US leadership in tackling the food & agriculture challenges outlined above and underscore the importance of leveraging private investment and collaboration.

²¹ Fuglie, K., Chancy, M., Helsey, P., "Private Sector Research and Development" in *From Agriscience to Agribusiness: Innovation, Technology and Knowledge Management* ed. Kalaitzandonakes, N. et al. (Basel: Springer International Publishing AG, 2018), 43.

²² Fuglie, K., Chancy, M., Helsey, P., "U.S. Agricultural R&D in an Era of Falling Public Funding," *USDA Economic Research Service*, November 10, 2016, <https://www.ers.usda.gov/amber-waves/2016/november/us-agricultural-rd-in-an-era-of-falling-public-funding/>.

²³ Huang, J., Hu, R., Rozelle, S., "China's Agricultural Research System and Reforms: Challenges and Implications to the Developing Countries," *Asian Journal of Agriculture and Development* Vol. 1, No. 1 (June 2004): 8; Correa, P., Schmidt, C., "Public Research Organizations and Agricultural Development in Brazil: How Did Embrapa Get It Right?" *World Bank: Economic Premise* No. 145 (June 2014): 1 – 2.

²⁴ Fuglie et al., "US Agricultural R&D"

²⁵ Ibid.

²⁶ Helsey, P. and Fuglie, K., "Agricultural Research in High-Income Countries Faces New Challenges as Public Funding Stalls," *USDA Economic Research Service*, May 29, 2018, <https://www.ers.usda.gov/amber-waves/2018/may/agricultural-research-in-high-income-countries-faces-new-challenges-as-public-funding-stalls/>

²⁷ Fuglie et al., "US Agricultural R&D"

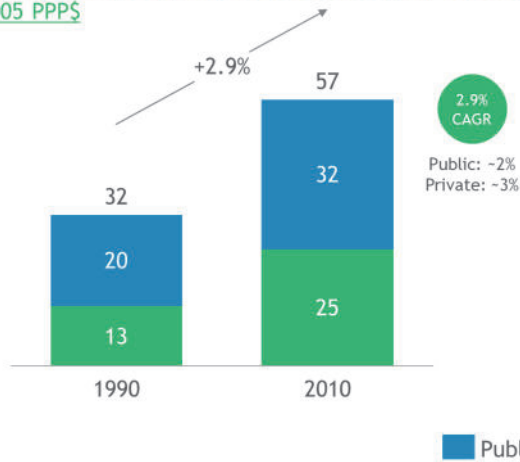
²⁸ Ibid.

²⁹ Fuglie, K., Toole, A., "The Evolving Institutional Structure of Public and Private Agricultural Research," *American Journal of Agricultural Economics* 1, No. 22 (January 2014).

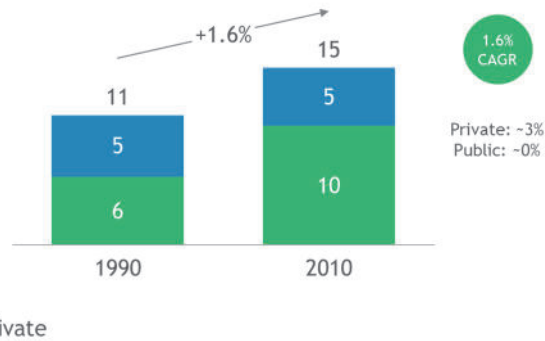
³⁰ Ibid.

Global and US food and agriculture R&D spend, from 1990 to 2010.

Global food and agriculture R&D spend (\$B), constant 2005 PPP\$

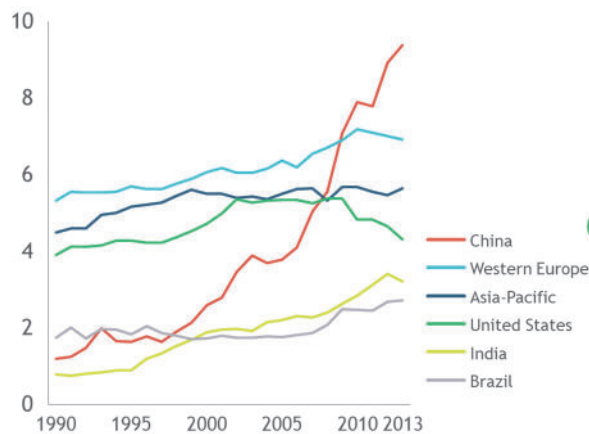


US food and agriculture R&D spend (\$B), constant 2013 PPP\$



CAGR: Compound Annual Growth Rate; Note: Traditional food & agriculture R&D definition includes ag inputs (e.g., crop seeds, farm machinery, animal health) and food manufacturing (e.g., meat processing, dairy, fruits and vegetables). Does not include ag-/food-related R&D spending in other sectors, e.g., technology & health
Source: For global R&D numbers: Agricultural Science and Technology Indicators, Heisey and Fuglie (2016); For US R&D numbers: USDA Economic Research Service

Global public spend in food & agriculture R&D from 1990 to 2013.

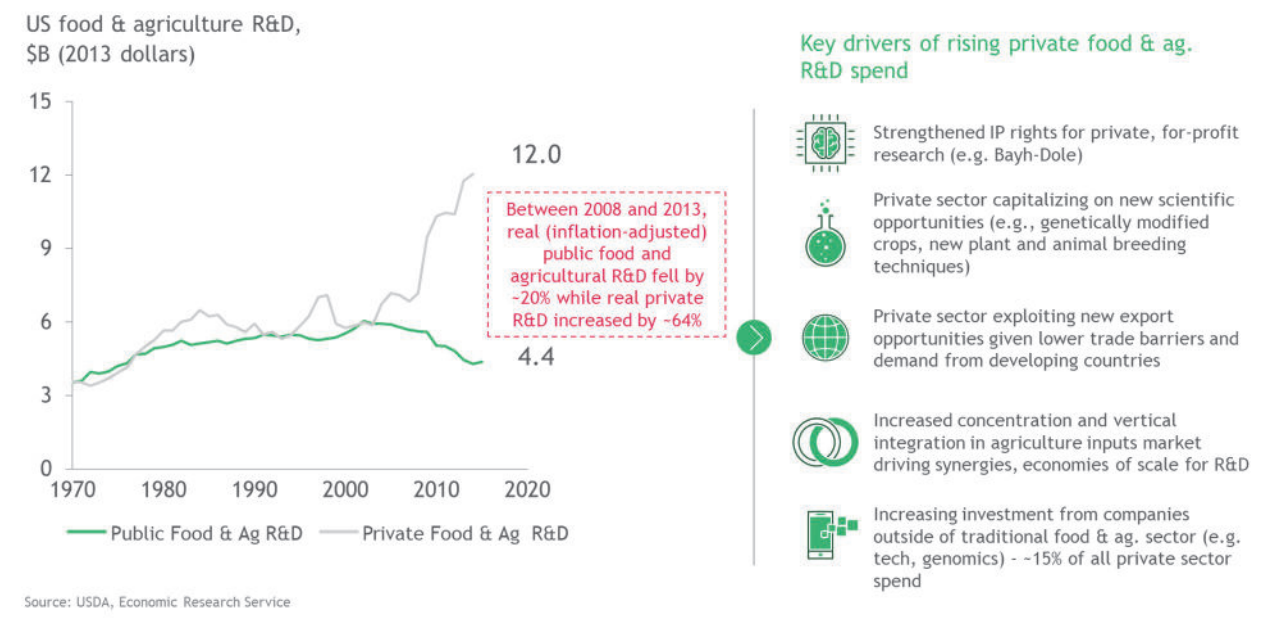
Global public spend in food & ag. R&D from 1990 to 2013
Constant 2011 PPP, \$B

US public sector falling vs. rising private sector spend

- Globally, greater share of public than private spend in food & ag. R&D
 - Global spend \$32B public, \$25B private vs. US \$4B public, \$12B private
- Declining public food & ag. R&D spend in the US while global spend growing
 - From 2005 to 2013, US public R&D spend had a decline of -3% CAGR vs. global 2% growth
 - China overtook the US in 2008 with 12% CAGR in the same period; Brazil CAGR 6% and EU 1%
 - Significant shift from US public to private R&D in biotech crops; Relatively lower proportion of food R&D vs. commodities via check-off programs
- Innovation and productivity declining as a result
 - Among major players, US has the lowest intensity (public spend / ag. GDP) of public food & ag. R&D spending
 - US: 1 (spend / GDP) vs. Western Europe 4.8, Asia Pacific 4.4

Source: USDA ERS, "U.S. Agricultural R&D in an Era of Falling Public Funding," 2016; Pardey, Chan-Kang, Beddow and Dehmer, "Long-run and Global R&D funding trajectories: The US Farm Bill in a Changing Context," (2014); Kalaitzandonakes, Carayannis, Grigoroudis, Rozakis, "From Agriscience to Agribusiness," 2018; Jaruzelski and Staack, "The Role of Private-Sector R&D in Agricultural Innovation," (2013), Fuglie and Toole, "The Evolving Institutional Structure of Public and Private Agricultural Research," (2014)

US public and private food & agriculture R&D, 1970 to 2015.



There is growing interest and investment in certain topics from the food & agriculture industry, many of which are in line with FFAR's challenge areas. Overall, food & agriculture companies are expressing greater interest and publicly committing to investments in areas such as improving environmental sustainability in their supply chains, reducing plastic and packaging use, creating more nutritious and better-for-you foods, and reducing food loss & waste.

Examples include:

- **Mars'** Sustainable in a Generation pledge of \$1 billion dollars to eliminating 100% of its greenhouse gas emissions by 2040³¹
- **Walmart** has invested heavily in sustainability initiatives like Project Gigaton, which aims to reduce 1 billion metric tons of emissions from its global supply chains by 2030.³²
- **General Mills** has focused its efforts on reducing food waste with the goal of reducing food waste at 30,000 businesses by 2021, which it has begun to do through its launch of MealConnect, a large-scale surplus food recovery program.³³
- **Nestle** is accelerating efforts to tackle plastic waste, with the commitment of making 100% of their packaging recyclable or reusable by 2025.³⁴

³¹ "Sustainability Plan", *Mars*, <https://www.mars.com/sustainability-plan>.

³² "Sustainability in our Operations," *Walmart*, <https://corporate.walmart.com/global-responsibility/sustainability/sustainability-in-our-operations>.

³³ "Food Waste," *General Mills*, <https://www.generalmills.com/en/Responsibility/Sustainability/food-waste>.

³⁴ "What is Nestle doing to tackle plastic waste?" *Nestle*, <https://www.nestle.com/ask-nestle/environment/answers/tackling-packaging-waste-plastic-bottles>.

In addition to areas of public and social interest, companies continue to invest in R&D in line with their business needs, including:

- **Agriculture input companies**, which continue to invest R&D dollars in animal nutrition, farm machinery and crop fertilizers, the three biggest input sectors³⁵
- **Ingredient suppliers**, which continue to invest to serve growing health and wellness markets, including in areas such as plant-based and alternative proteins and probiotics.³⁶

And, non-traditional players such as technology companies and financial institutions are beginning to invest in food & agriculture as well. Topics of R&D interest among private sector players is essentially at the nexus of food & agriculture and other disciplines. These include, for example:

- **Technology**: Growing interest at the intersection of agriculture and technology, with investments in big data & analytics, precision agriculture, drones & robotics, sensor & mapping technologies, waste technology, etc.³⁷
- **Venture Capital**: Emerging as a key source of funding for AgTech, with over \$6.9 billion dollars of investment in upstream AgTech. According to AgFunder, "AgriFood tech is maturing as a VC industry."³⁸
- **Insurance**: Climate change is increasing production risk, as measured by yield variability. CGIAR, among other institutions and industry representatives, are advocating for the development of "Climate Smart Insurance" products that can complement public policy by promoting the production of more climate resilient crops.³⁹

Given these dynamics, there is an opportunity to leverage increasing private sector funding to address the tremendous challenges facing the world's food & agriculture systems today.

³⁵ Fuglie, K., Heisey, P., King, J., Schimmelpfennig, D., "Private Industry Investing Heavily, and Globally, in Research To Improve Agricultural Productivity," *USDA Economic Research Service*, June 5, 2012, <https://www.ers.usda.gov/amber-waves/2012/june/private-industry/>

³⁶ Gordon, L., Bandy, L., "R&D Key to Success for the Ingredients Industry," *Euromonitor International* (2012)

³⁷ Fuglie, K., "The growing role of the private sector in agricultural research and development world-wide," *Global Food Security* 10 (2016): 37.

³⁸ AgFunder, "AgFunder AgriFood Tech Investing Report: 2018 Year in Review" (2018)

³⁹ Kramer, B., "Climate-smart insurance for weather risks: Enhancing farmers' adaptive capacity," *CGIAR*, <https://ccafs.cgiar.org/climate-smart-insurance-weather-risks-enhancing-farmers-adaptive-capacity#.XN7DuY5Kg2w>.

APPENDIX E - DETAILED FINDINGS FROM BASELINE ASSESSMENT

BCG assessed FFAR's activities to date in order to understand FFAR's progress, impact, value proposition and unique role, as well as to identify opportunities to increase the scale and magnitude of the Foundation's impact in the food & agriculture sector.

This section provides a summary of BCG's key findings based on an assessment of FFAR's programs and grant portfolio, interviews and surveys with grantees, current and potential funding partners, consortia members, experts, and other key stakeholders, a review of relevant literature.

OVERVIEW OF KEY FINDINGS

- FFAR has been in existence for five years, effective July 2019.
- In this short time, FFAR has built a unique and multi-pronged value proposition with several components:
 - Leveraging public dollars to mobilize private investment;
 - Forming partnerships between entities who do not traditionally work together;
 - Identifying & addressing important gaps in food & agriculture R&D; and
 - Facilitating translation of research into impact.
- Stakeholders believe that FFAR's success to date and its value proposition is greatly derived by its Congressional mandate and funding, and that continued Congressional funding is essential to sustaining FFAR's scale of impact and ability to achieve its mission.
- Stakeholders and research on analogue organizations highlight several opportunities for FFAR to increase its impact and diversify its funding base, including:
 - Increasing the funding match ratio for select project types;
 - Expanding the number and scale of consortia;
 - Facilitating translation of research & technology transfer;
 - Diversifying FFAR's funding partners, including with non-traditional players;
 - Fundraising for FFAR's mission & challenge areas (in addition to project-based funding matches);
 - Commercializing FFAR's program administration and other technical and advisory capabilities as services to other organizations; and
 - Deepening collaboration with USDA and other federal agencies.
- It seems most analogue organizations do not have a singular business or funding model; rather, they remain adaptable so they can pursue models that maximize their impact while creating a diverse and stable financial base.

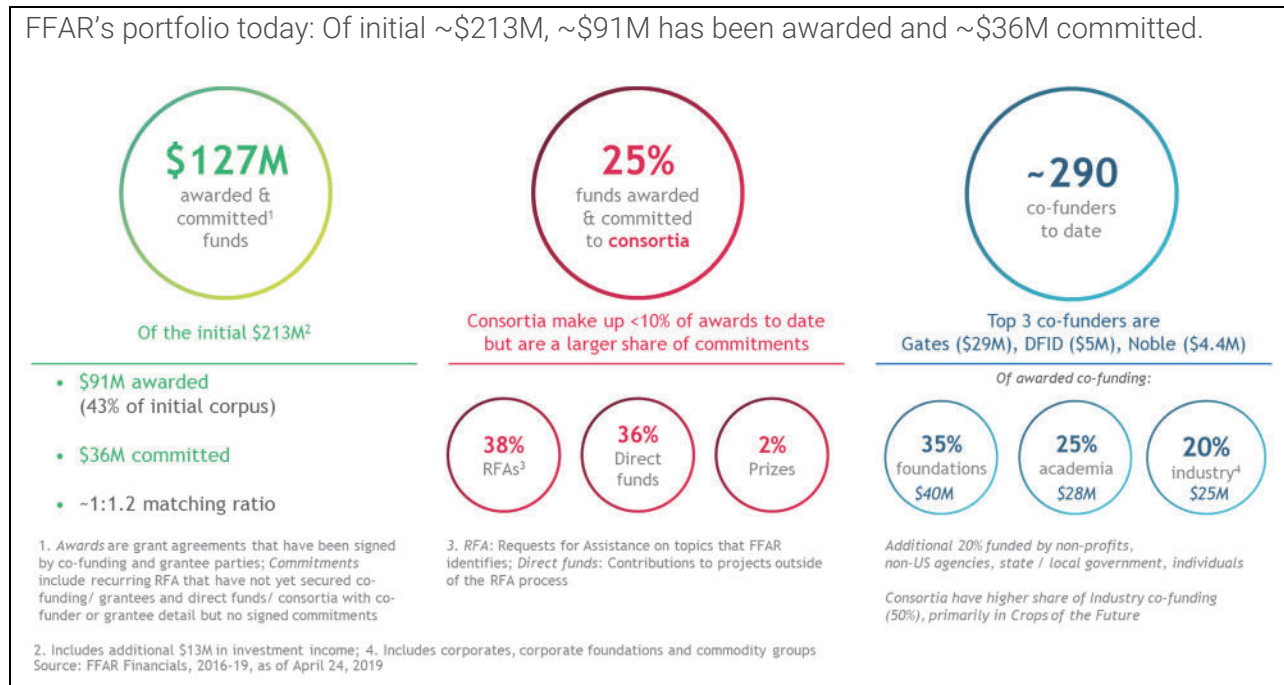
DISCUSSION ON KEY FINDINGS

Since it was established in 2014, FFAR has built an organization that has facilitated nearly \$250M in new funding, over half of which is from non-federal funders, to over 100 food and agriculture R&D projects spanning topics as wide ranging as photosynthetic efficiency, antimicrobial stewardship, and food loss and waste.

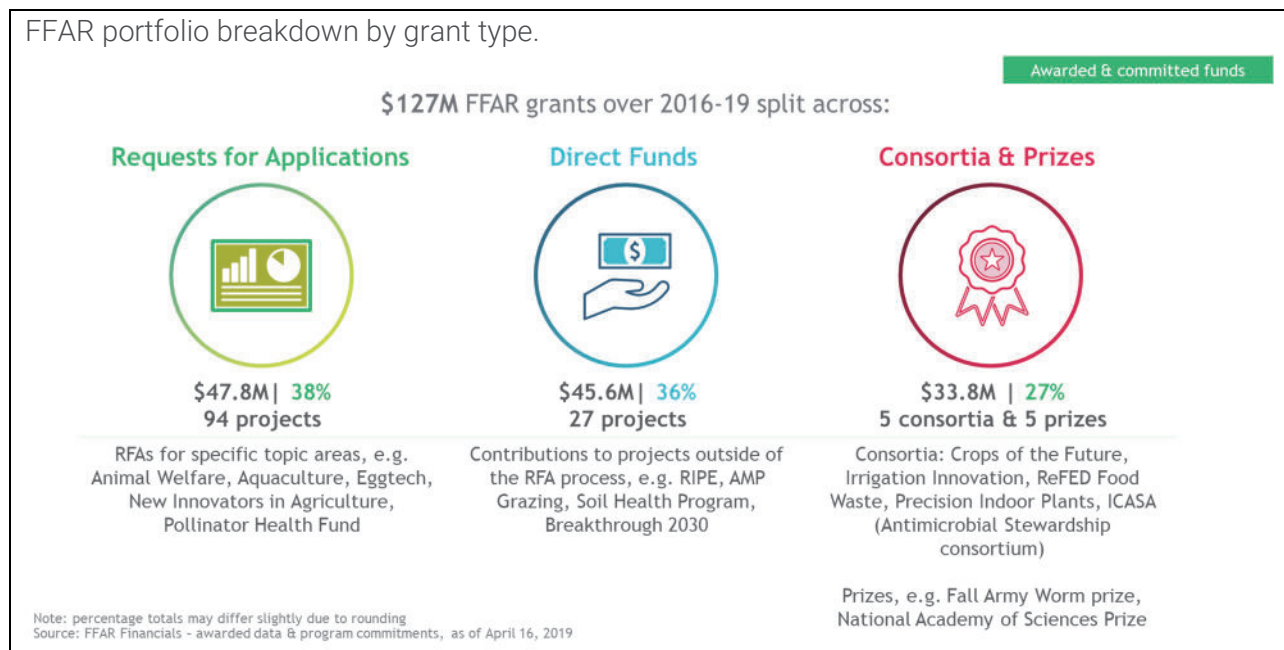
Under its public-private partnership and matched funding model, FFAR has worked with nearly 300 co-funders representing foundations, academia, and a wide range of industry players including commodity & producer groups, agricultural input and food manufacturing companies, and food service operators and retailers. Many of FFAR's

partners are among the largest players in their respective sectors, including the Bill & Melinda Gates Foundation, the UK Department for International Development, the National Pork Board, Bayer, General Mills, Walmart and McDonald's.

FFAR's portfolio today: Of initial ~\$213M, ~\$91M has been awarded and ~\$36M committed.



FFAR portfolio breakdown by grant type.



FFAR has funded numerous transformative research projects which seek to have large-scale impact on the food and agriculture sector. It has been able to identify unmet needs in the research space and facilitate funding and research partnerships to meet those needs.

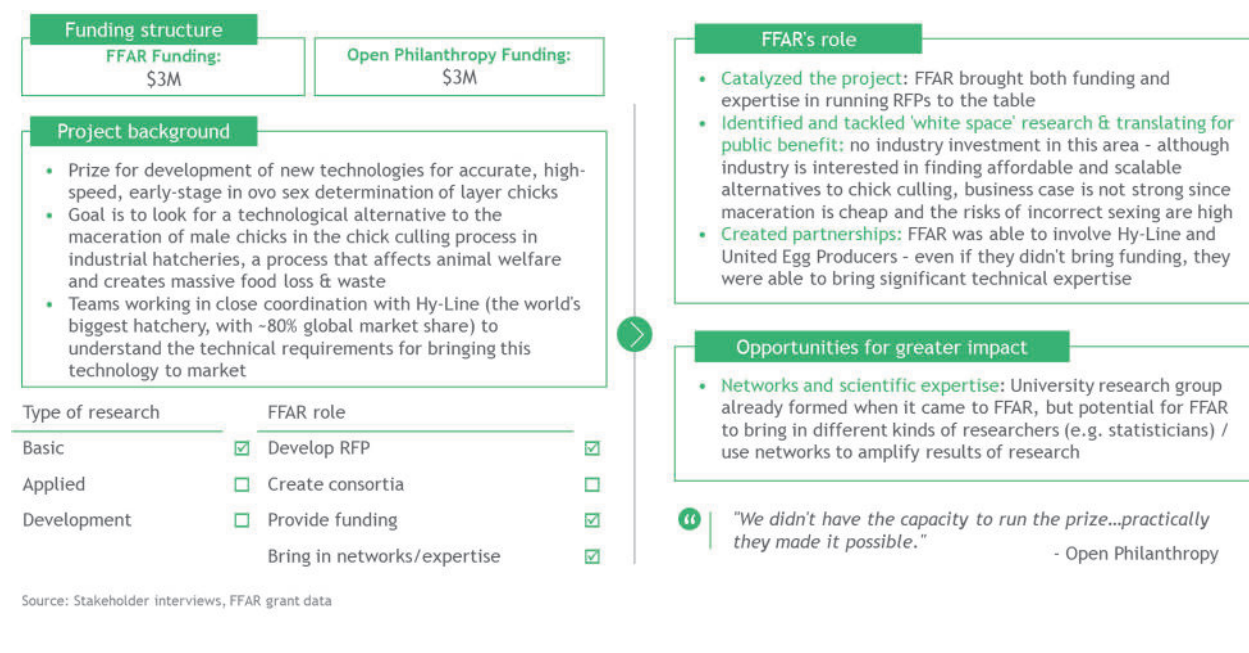
Description of Egg-Tech Prize

FFAR and the Open Philanthropy Project are together offering up to \$6 million in prizes (Egg-Tech Prize) to the firm, group or individual who successfully develops a technology that can accurately and rapidly determine a chick's sex as early as possible in the egg production process.

Egg industry workers are currently only able to identify a chick's sex after it hatches. For the 6 billion laying hens hatched each year worldwide, a similar number of male chicks are produced that never make it to market. The male chicks cannot lay eggs and are unsuitable for consumption due to poor growth performance and meat quality. As there is no need for the male chicks, they are culled, a practice known as male chick culling. If egg hatcheries had a technology to determine the chick's sex on the day it is laid, over 6 billion male eggs could be used for food, animal feed or vaccine production. It would also reduce the cost and carbon footprint of incubating layer eggs. This technology would save the egg industry between \$1.5 - \$2.5 billion each year.

Current approaches to solving this challenge range from gene-editing to measuring an egg's hormone levels to determine its sex. However, these proposed solutions have drawbacks that prevent global adoption. An ideal solution would determine a chick's sex early in development, before hatcheries invest in incubation and without genetically modifying the poultry genome. Recent advancements in sensor technologies, engineering and biological sciences suggest that it is possible to develop a technology that both successfully determines an egg's sex before it hatches and can be integrated into existing production systems.

FFAR's contribution: FFAR is partnering with the Open Philanthropy Project to enable this research that is expected to have significant impact on the food & agriculture sector. In addition to providing funding, FFAR is designing and administering the prize and bringing industry representation into the project to ensure that the technologies developed can be adopted at scale.



FFAR has also expanded the ways it works. For example, FFAR has seen early success in creating consortia on critical topics such as Crops of the Future, Antimicrobial Stewardship in Livestock, Irrigation Innovation, and Precision Indoor Plants.

These consortia are larger-scale collaborative research partnerships between producers, industry, scientists of different disciplines, and other food and agriculture stakeholders who benefit from the innovative thinking that arises when a diverse team works toward a shared goal. FFAR is able to draw on its convening capacity to bring together partners who may not typically work with each other to solve big problems on a pre-competitive basis.

Additionally, FFAR has organized convening events that bring together thought leaders and experts from academia, government, industry, and commodity and farm groups to identify gaps in research areas and drive socially feasible and economically viable solutions starting at the program design phase. FFAR held 10 convening events with 400 attendees that resulted in at least five new initiatives in 2017 alone. By engaging key stakeholders and experts at convening events, FFAR aims to address research questions that are not being asked elsewhere and uncover results with potential to enhance the economic and environmental resilience of our food supply.

FFAR is also exploring new opportunities to expand its impact and funding, including co-operative agreements with federal agencies, windfall profits⁴⁰ from select grants and administering research programs for third party partners.

Since establishment, FFAR has built a unique and multi-pronged value proposition centered on its public-private partnership model.

In interviews and surveys, FFAR's stakeholders consistently highlighted key components of FFAR's value proposition – the combination of FFAR's strengths and its ability to uniquely address the needs of stakeholders in the food & agriculture sector. These components include:

- a) **Leveraging public dollars to mobilize private investment** – When asked to rank FFAR's top comparative advantage, nearly 60% of stakeholders ranked FFAR's ability to catalyze private co-funding against federal funding to expand research impact among the top three.
- b) **Forming partnerships between entities who do not traditionally work together** – About 45% of stakeholders ranked FFAR's ability to create partnerships with actors who would not otherwise work together in their top three.
- c) **Identifying & addressing important gaps in food & agriculture R&D** – About 40% of stakeholders ranked FFAR's ability to identify and tackle unaddressed research areas in their top three.
- d) **Facilitating translation of research into impact** – A third of stakeholders, ranked FFAR's ability to facilitate the translation of research into impact in their top three.

"The model of public private partnership is a really important space that wasn't previously filled in the US [food & agriculture] R&D world before FFAR."

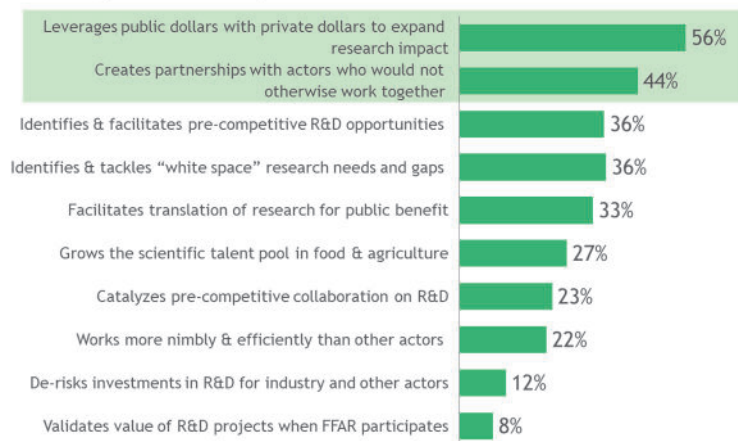
FFAR Stakeholder

⁴⁰ FFAR includes windfall clauses in its grant agreements thereby requiring grantees to make a milestone payment to FFAR if the research funded by FFAR is commercialized. Payments are a multiple of the FFAR grant and capped.

Stakeholder survey – FFAR's value proposition

Q: What do you see as FFAR's greatest comparative advantages?

% of respondents that rank top three



Key insights

- 56% of respondents ranked FFAR's ability to leverage public with private dollars among top three comparative advantages

"If federal agencies could do those things [public-private partnerships], we wouldn't have pushed for the creation of a foundation"

- 44% ranked ability to create unlikely partnerships across unique players

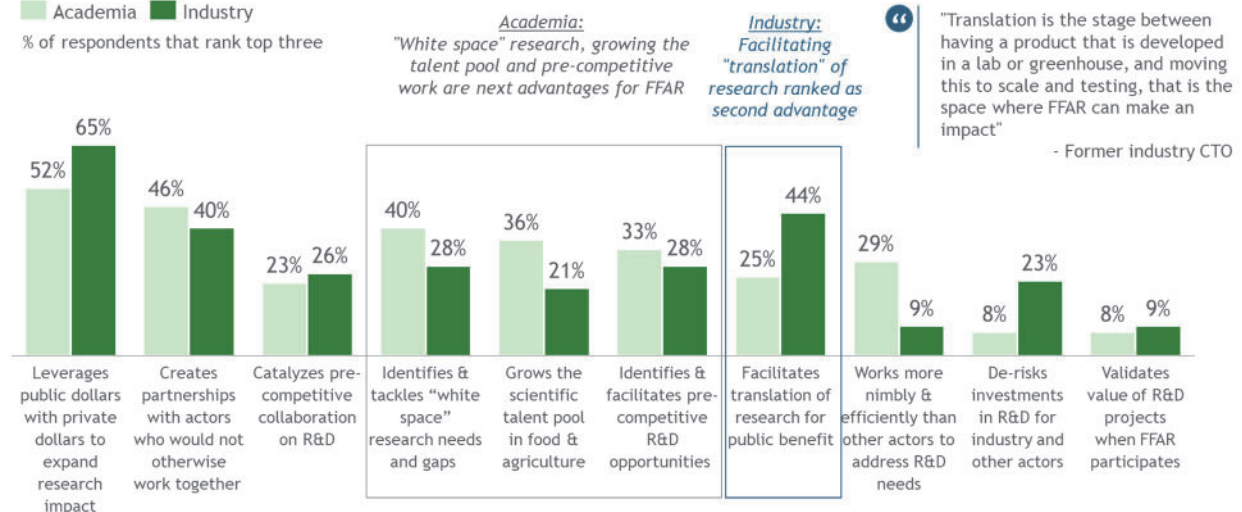
FFAR "brings unique players to the table - it would be hard for them to come together without that collaborative synergy that FFAR is bringing to it"

Source: FFAR Stakeholder Survey (March/April 2019), "What do you see as FFAR's greatest comparative advantages? In what areas does FFAR add the greatest value to your work in the food & agriculture sector?" n = 219

Stakeholder survey – FFAR's value proposition by industry and academia

Academia Industry

% of respondents that rank top three



Academia:
"White space" research, growing the talent pool and pre-competitive work are next advantages for FFAR

Industry:
Facilitating "translation" of research ranked as second advantage

"Translation is the stage between having a product that is developed in a lab or greenhouse, and moving this to scale and testing, that is the space where FFAR can make an impact"

- Former industry CTO

Source: FFAR Stakeholder Survey (March/April 2019), "What do you see as FFAR's greatest comparative advantages? In what areas does FFAR add the greatest value to your work in the food & agriculture sector?", academia n = 106, industry n = 43

Stakeholders believe that FFAR's success to date and value proposition is enabled by its Congressional mandate and funding, and that continued Congressional funding is essential to sustaining FFAR's scale of impact and ability to achieve its mission.

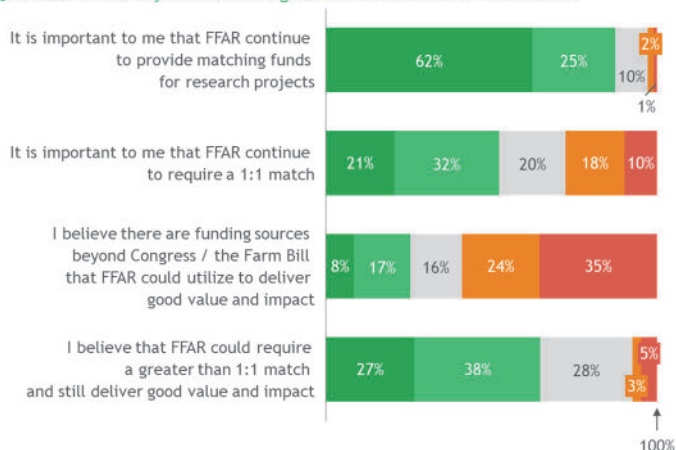
FFAR's stakeholders reinforced the critical role of FFAR's Congressional funding to its value proposition and success. Over 80% of stakeholders believe that FFAR's Congressional funding is a critical component of FFAR's model, and contributes significantly to FFAR's credibility and ability to make an impact in food & agriculture R&D.

Specifically, stakeholders indicate that:

- **FFAR's Congressional mandate** contributes to its gravitas and being seen as an independent and neutral third party. This enables FFAR to credibly convene and build partnerships and provides legitimacy to the research that it facilitates.
- **FFAR's Congressional funding** enables it to bring partners to the table and ability to maintain a degree of independence from industry and other funders; About 90% of surveyed stakeholders indicated that the quality of FFAR's research programs are very important to FFAR's credibility and impact.

Stakeholder survey - Funding

Q: Please indicate your level of agreement to the statements below



Key insights:

- ~70% respondents believe that FFAR's 1:1 match is required to deliver impact
- However, **only one quarter of all respondents** believe that FFAR could **deliver value and impact without Congressional funding**

Note: Results stripped of 'Don't know/Not sure/NA' responses
Source: FFAR Stakeholder Survey (March/April 2019), n = 219

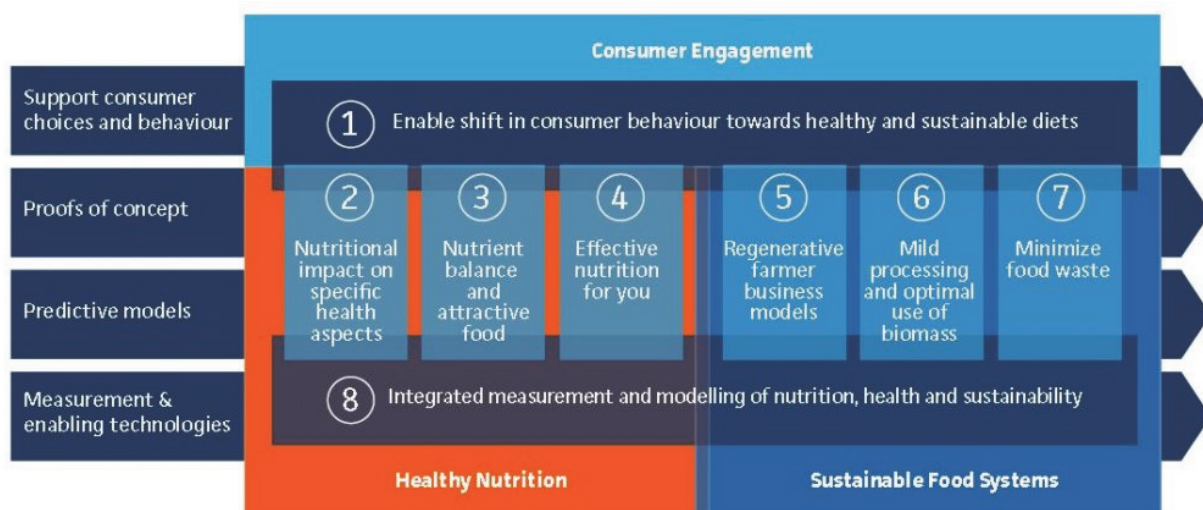
Furthermore, in Europe public-private partnerships are a mainstay for collective action to advance innovation. Programs such as the European Commission's Horizon 2020 program, the European Union's European Institute of Innovation & Technology, and the Netherlands' Topsector Agri & Food builds on public funds through matching from private funders to create larger pools of R&D and innovation investment. Industry experts participating in European private-public partnerships speak positively about the impact these programs are having, stemming from significant matching public funds and close collaboration among diverse stakeholders in government, industry and academia.

Box 2: TiFN / TopSector Vignette

The Dutch agri-food sector contributes nearly 10% to Holland's economy and employment. It comprises 13% of Dutch exports and is viewed as a leading contributor to global agri-food and nutrition research/innovation.⁴¹

The Top Institute Food & Nutrition (TiFN) was established in 1998 as a public-private partnership focused on long-term, pre-competitive, multi- and interdisciplinary research in food & nutrition. Prior to 2010, TiFN was primarily funded directly by the Dutch government and operated on a matching grant-making basis, forming partnerships and consortia with other government, academic, and industry organizations and companies, to match TiFN's public funding. In 2010, the Dutch government launched its "top sector" policy, an effort to realign and optimize government support for innovation around nine economic areas in which the Netherlands plays a leading role globally. The main drivers for this policy were to leverage fiscal policy as a replacement for subsidies and grants; use regular financing to encourage PPPs; reduce fragmentation in innovation policy; and increase the involvement of government ministries (other than Economic Affairs).⁴² As a result of this policy shift, TiFN's public funding was moved to be overseen by Top Sector Agri & Food which retained the private matching requirement.

Today, TiFN does not provide its own funding to projects, but instead builds consortia that apply to public funders, including Top Sector Agri & Food and NOW (Netherlands Organization for Scientific Research) and private funders, including industry members in the consortia. As a result, TiFN is a significantly smaller organization than before and derives its operating budget from a small percentage of the funding it facilitates through consortia.

TiFN's 3 Strategic Themes & 8 Innovation Areas⁴³

Stakeholders also note that Congressional funding is critical for FFAR to deliver on its mission to foster public-private partnerships. Without continued Congressional funding, FFAR would lose the "public" aspect of public-private partnerships.

⁴¹ <https://www.hollandtradeandinvest.com/key-sectors/agriculture-and-food/agrifood-facts-figures>

⁴² <https://english.awti.nl/binaries/awti-eng/documents/publications/2014/10/2/status-of-the-top-sectors-in-2014/status-of-the-top-sectors-in-2014-summary.pdf>

⁴³ <https://www.tifn.nl/strategic-themes-and-innovation-challenges/>

Stakeholders and research on benchmark organizations highlight several opportunities for FFAR to increase its impact and diversify its funding base.

Interviews with FFAR's stakeholders and lessons learned from the activities of analogue organizations surfaced several opportunities for FFAR to enhance its impact in the food & agriculture sector. These opportunities also point to prospects for FFAR to diversify and explore new funding models.

Seven of these opportunities are below:

- Increasing FFAR's matching target for select project types
- Expanding the number and scale of FFAR's consortia
- Facilitating research translation and technology transfer
- Diversifying FFAR's funding partners
- Fundraising for FFAR's mission and Challenge Areas (*separate from and in addition to matching funding*)
- "Commercializing" FFAR's capabilities on a fee-for-service basis
- Deepening collaboration with USDA and other federal agencies

It is important to note that these opportunities represent varying levels of departure from FFAR's current model and that capturing the potential of these opportunities will require strengthening FFAR's capabilities, brand, and, to an extent, its value proposition.

The remainder of this section outlines each opportunity for increased impact and funding diversification.

Increasing FFAR's matching target for select project types

FFAR is required by statute to match each public dollar spent with a minimum of another dollar of private funding (a "1:1 match"). To date, FFAR has exceeded this requirement, achieving an average 1:1.25 match across all of its projects. This has been the result of select projects where FFAR's funding partners have contributed greater funding.

There is an opportunity for FFAR to increase its matching ratio for certain types of projects and therefore provide greater leverage to the funding that FFAR receives from Congress. For instance, the National Fish and Wildlife Foundation (NFWF) targets a 1:2 match on the public funding that it receives.⁴⁴ In the Netherlands, TopSector Agri & Food flexes its matching requirement up to 1:2, requiring a greater match from private sources for projects with high potential to generate commercial value for industry.

⁴⁴ "Resilient Communities Program," National Fish and Wildlife Foundation, October 2018, <https://www.nfwf.org/resilientcommunities/Pages/home.aspx>.

Box 3: National Fish and Wildlife Foundation Vignette

The National Fish and Wildlife Foundation (NFWF) was established by Congress in 1984 “as a federally chartered charitable, non-profit corporation to administer donations of real or personal property, or interests therein, in connection with Fish and Wildlife Service programs and conservation activities in the United States.”⁴⁵

In the over 30 years since its founding, NFWF has grown to become the nation’s largest private conservation grant-maker, working with 15 federal partners and more than 45 corporate and foundation partners for cumulative conservation impact of more than \$5.3 billion. Similar to FFAR, Congress requires that each federal dollar NFWF awards be matched with an equivalent non-federal matching contribution. NFWF publicly states that it seeks to exceed this requirement, aspiring to \$2 in matching contributions for each federal dollar awarded.⁴⁶ In 2018, NFWF reported over \$300m in revenues, with 26% (\$80M) coming from federal sources and 74% (\$223M) coming from non-federal and other sources. In terms of expenditures, NFWF invested more than \$324m in conservation projects which drew \$159m in matching support from grantees and generated total conservation impact of \$483m.⁴⁷

NFWF has been able to achieve this strong performance by building partnerships, taking a science-based approach to funding the best projects, and diligently measuring and communicating results.

Building partnerships: In addition to working closely with the Department of Interior, NFWF is also a conservation partner for the Departments of Agriculture, Commerce, and Defense. NFWF also works with the Department of Justice as a manager and trustee for funds from legal and regulatory actions involving natural resources. Over time, NFWF has leveraged its Congressional mandate and funding to attract corporate partners (including building a new consortium in the energy sector to address shared environmental challenges) and foundations who work with NFWF to multiple the impact of their contributions.

Funding the best projects: NFWF commits to science-driven conservation programs by operating projects at a landscape scale; building on past successes and public-private partnerships in focal landscape areas; implementing and managing competitive grant programs with proposals reviewed by experts and approved by NFWF’s Board; and supporting some of the nation’s largest conservation non-profits including The Nature Conservancy, The Conservation Fund, and Ducks Unlimited as well as smaller organizations to address local conservation needs.

Measuring results: Critical to its credibility and success in attracting partners is NFWF’s commitment to measuring impact. NFWF measures impacts through developing detailed business plans that guide its grant-making; setting and monitoring key metrics to assess project effectiveness, funding applied science that will help inform resource allocation, and facilitating internal and external reviews and adaptive management to ensure progress tracking and pivots when needed.⁴⁸

Interviews and surveys with FFAR’s stakeholders support this opportunity. While many stakeholders, particularly grantees, would like to maintain FFAR’s 1:1 match, 40% of current and potential FFAR co-funding partners indicated they would be willing to provide a greater than 1:1 match for projects that were more likely to generate downstream commercial value for the funding partner.

⁴⁵ <https://www.fws.gov/laws/lawsdigest/NATLFW.HTML>

⁴⁶ <https://www.nfwf.org/whatwedo/grants/applicants/Pages/faqs.aspx>

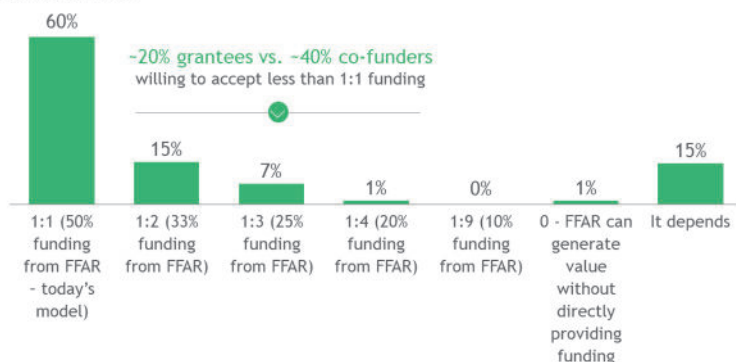
⁴⁷ <https://www.nfwf.org/whowere/mediacenter/Documents/2018-annual-report.pdf>

⁴⁸ <https://www.nfwf.org/whowere/mediacenter/Documents/2018-annual-report.pdf>

Stakeholder survey – FFAR's matching model

Q: What is a reasonable minimum matching in order for FFAR to continue to generate value and make a positive impact on a research project or consortium?

70% grantees vs. ~40% co-funders think 1:1 matching required for impact



Source: FFAR Stakeholder Survey (March/April 2019), n = 219, grantees (current, past and prospective) n = 112, co-funders (current, past and prospective) n = 28

Key insights:

- ~60% respondents think that 1:1 matching is required for FFAR to create impact ...
- ... However ~40% of current & potential co-funders willing to accept a higher match (FFAR funding less)
- Interviews and survey comments highlight potential for FFAR to adapt matching requirement based on research type/benefit - i.e., higher match requirement for projects where industry is likely to benefit vs. "public good"

It is important to note however, that not all projects and funding partners could tolerate a higher match requirement. FFAR will continue to fund potentially transformative projects to advance the public and social interest on a 1:1 match basis. However, stakeholder input and benchmarks point to opportunities to flex FFAR's matching requirement based on the potential commercial value of the projects as well as the number of co-funding partners.

Expanding on number and scale of consortia

To date, FFAR has supported the creation of five consortia, with funding ranging from \$1 million to \$20 million (inclusive of matching funding). As noted above, FFAR has been particularly effective at building consortia to facilitate pre-competitive research in areas of mutual interest across stakeholder groups. These consortia represent a powerful way for FFAR to leverage its unique value proposition to tackle big problems that require collective action and collaboration across key actors.

In interviews, stakeholders point to opportunities for FFAR to further enhance the strategic value of consortia by deepening collaboration and relationship building among consortia members. FFAR could do so by bringing in new partners across and outside of the food & agriculture value chain to solve upstream and downstream problems, and by facilitating more collaborative research models between universities and industry. Enhancing the value that consortia bring to partners will enable FFAR to create additional and more impactful consortia, providing even greater funding leverage.

Facilitating research translation and technology transfer

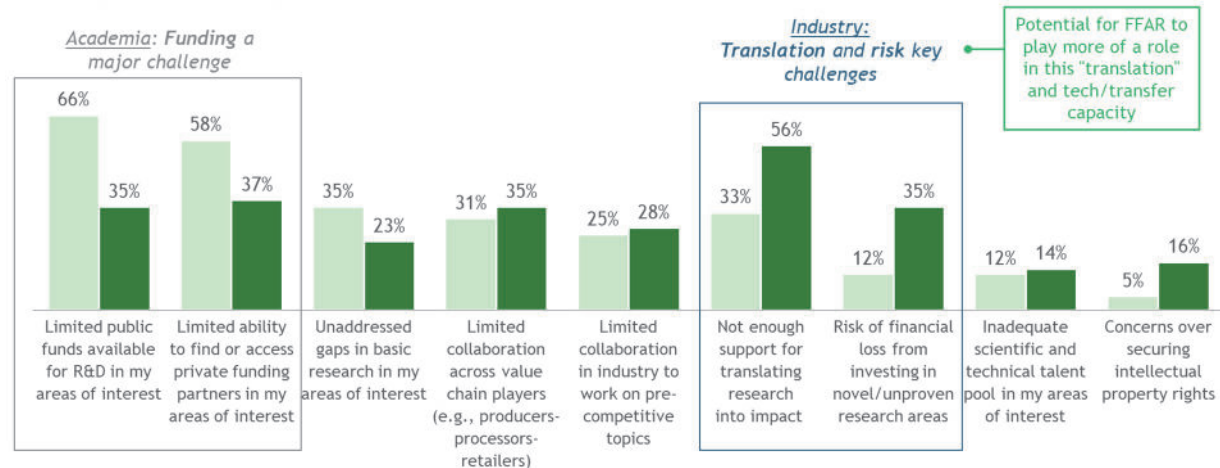
In interviews and the stakeholder survey, industry representatives noted "insufficient support for facilitating research into impact" as their top R&D challenge.

Key R&D challenges – industry vs. academia

Q: Where do you see the biggest gaps/challenges in your priority R&D areas?

% of respondents that rank top three

Academia Industry



Source: FFAR Stakeholder Survey (March/April 2019), Academia n = 106, Industry n = 43

"Industry partners don't necessarily understand how new technology could enhance their operations. It is the classic issue of 'you don't know what you don't know.' Likewise, academic and government researchers have little understanding of industry "pain-points". As a convener, FFAR can help foster these conversations, and make connections between researchers and the needs of industry."

FFAR Stakeholder

Many stakeholders indicated that creating connections between researchers and industry and helping to facilitate the translation and transfer of research to impact is a role that FFAR is particularly well-suited to play given its position.

Today, FFAR helps facilitate research translation and technology transfer through several models, including:

- Incorporating end user perspectives in basic/applied research (e.g., in consortia and through funding and advisory partnerships)
- Funding translational research that can be adopted or scaled in the near term
- Providing access to research data for further development/translation and adoption
- Matching researchers & research to companies interested in co-development and commercialization partnerships

FFAR can capitalize on its strong network and connections and ability to "see both sides" of research and application to engage in more activities that support research translation and technology transfer. This can enable FFAR to expand the impact of the research

it funds, build/reinforce even stronger partnerships, and potentially tap into new sources of funding as it increases the value it offers to partners.

Diversifying FFAR's funding partners, including with non-traditional players

One of the most powerful aspects of FFAR's model has been its ability to bring private funding – from foundations, industry, and others – to match its public funds. This is powerful, not just because of the added investment, but also because FFAR is able to create research partnerships and collaborations outside of the traditional agriculture funding relationships (e.g., NIFA, land grant universities, etc). As examples, FFAR has co-funded projects with foundations (e.g., the Bill & Melinda Gates Foundation, Open Philanthropy Project), commodities groups (e.g., the National Pork Board), food manufacturers (e.g., General Mills), food service and retailers (e.g., McDonald's and Kroger), and venture capital funds (e.g., Acre Venture Partners).

As FFAR continues to mature, it will continue to grow and diversify the set of co-funders that it works with. In particular, stakeholders indicated that FFAR has an opportunity to take advantage of increased interest from actors who are not part of the traditional food & agriculture landscape, including technology companies (e.g., for big data and analytics and automation), financial services and institutions (e.g., insurance companies interested either in improving health outcomes or managing environmental risks), venture capitalists (in AgTech), and others.

Today, these non-traditional funders represent <5% of FFAR's co-funding. FFAR can increase impact by bringing different disciplines together to solve the tremendous challenges faced, while at the same time diversifying its funding and partner base.

Fundraising for FFAR's mission & challenge areas (separate from and in addition to matching funding)

In addition to diversifying co-funding partners, FFAR can, over the medium-term, work to raise philanthropic funding to contribute to its own corpus. These funds, which may be restricted or unrestricted, would be used in much the same manner as Congressionally appropriated funds to provide grants in support of FFAR's mission and challenge areas, and would be separate from the project-based matched funding that FFAR gets today.

"A big weakness in agriculture is not tapping into the broad range of researchers around the world...there are a lot of barriers [to researchers with non-ag backgrounds getting funding from USDA], and FFAR could potentially break down those barriers."

FFAR Stakeholder

This opportunity exists for FFAR for three critical reasons:

- FFAR is working on topics that are of growing interest to philanthropic funders, including environmental sustainability and the health-food-agriculture nexus.
- FFAR already has relationships with nearly 300 co-funders who have contributed to FFAR projects.
- FFAR's Congressional mandate and funding along with its growing track record of building partnerships forms the basis of a strong brand and reputation that it can leverage.

However, fundraising for FFAR's corpus represents a shift from FFAR's current model (fundraising for a project match) and would require FFAR to build new capabilities and connections. FFAR would need to invest in fundraising/development capabilities, strengthen its brand, reputation, and value proposition, and engage in a "test and learn" approach with potential donors.

Furthermore, an important component of FFAR's credibility is its Congressional mandate and funding, and therefore FFAR's ability to fundraise for its corpus from private sources would be severely limited if it did not have Congressional funding.

Commercializing FFAR's capabilities as services to other organizations

Stakeholders consistently mentioned several of FFAR's strengths – identifying research gaps, designing research studies, working in innovative ways (e.g., prizes, fellowships), convening diverse partners, building consortia, responding quickly to emerging threats (e.g., African swine flu), and connecting researchers and industry.

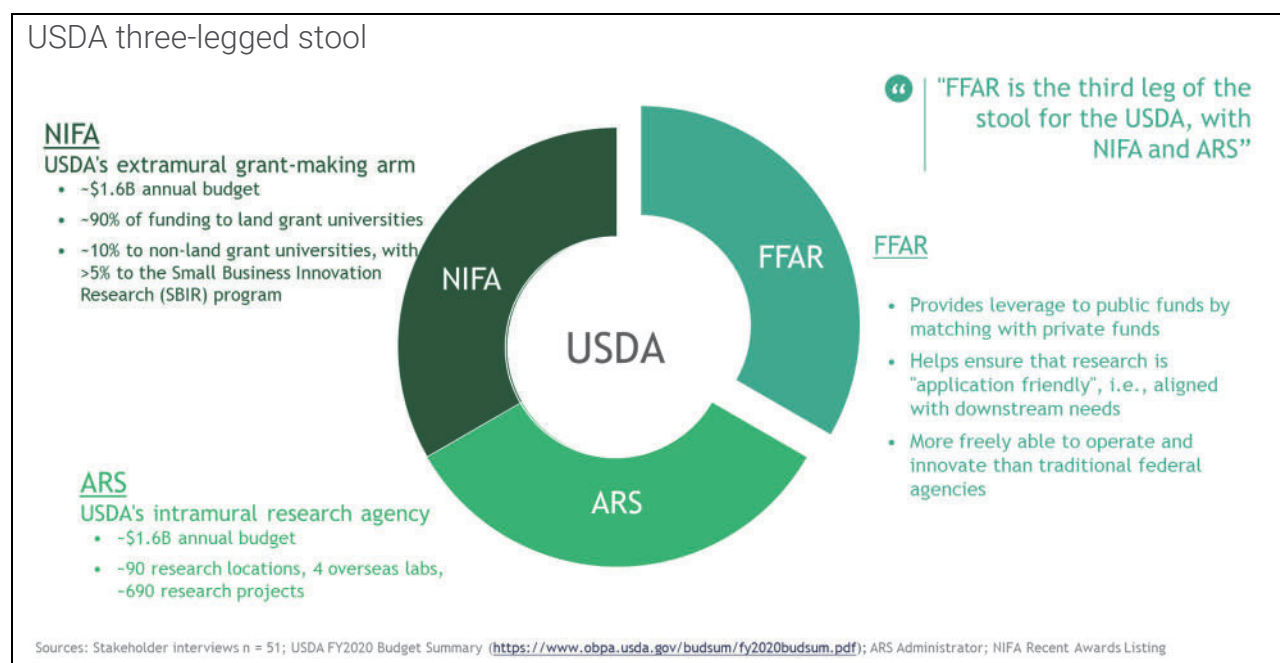
There is an opportunity for FFAR to explore commercializing these capabilities on a fee-for-service basis. A few ideas, based in FFAR's activities today and those of analogue organizations, include:

- Designing and running research prizes
- Building and operating consortia
- "Matchmaking" between research/researchers and companies with R&D problems
- Designing environmental sustainability programs within food & agriculture

FFAR would not likely fully become a service organization; however, exploring commercialization of these services could enable FFAR to leverage existing assets and capabilities, gain revenue to offset operational expenses, and increase its impact.

Deepening the already strong collaboration with USDA and other federal agencies

Several stakeholders called out that FFAR has an important and complementary role to play in the US food & agriculture R&D landscape as the “third leg [of the public funding’ stool]” – along with the National Institute of Food and Agriculture (NIFA) and the Agricultural Research Service (ARS). Specifically, FFAR provides leverage to public funds by matching with private funds, helps ensure that research is “application friendly” and aligned with sector and industry needs, and can operate more nimbly than traditional federal agencies.



As FFAR looks to the future, there are opportunities to deepen the already strong collaboration with the USDA as well as other federal agencies with an interest in food & agriculture R&D (e.g., NSF, NAS, DOD, NIH). Possible pathways include: fundraising from private sources against agency funding commitments to further increase leverage of public funds, connecting industry to government-owned intellectual property and researchers for translation and development of research, and administering programs related to food & agriculture R&D (including grant programs and consortia). FFAR is currently exploring a number of these ideas with various agencies.

A close relationship with the USDA further supports FFAR’s value proposition. Nearly 70% of surveyed stakeholders believe that FFAR’s partnership with USDA is extremely or very important to FFAR’s credibility and ability to make an impact in food & agriculture R&D.

Most benchmark organizations do not have a singular business or funding model; rather, they pursue models that maximize impact while creating a diverse and stable financial base.

Most analogue organizations, including the FNIH, NFWF, and international research organizations, do not rely solely on one business or funding model, but rather “mix and match” the ways they operate to take advantage of partnership and funding opportunities and maximize impact on their mission.

For example, **FNIH** operates and garners funding in multiple different ways:

- **Accelerating Medicines Partnership (AMP):** For Alzheimer disease (one of four therapeutic areas), FNIH has raised over \$60M in industry and non-profit funding and in-kind contributions to complement \$162M in NIH funding. Industry members include AbbVie, Biogen, Eli Lilly and GlaxoSmithKline.⁴⁹
- **Biomarkers Consortium (BC):** FNIH, with others, identified an opportunity to collaborate, on a pre-competitive basis, to discover, develop and seek regulatory approval for biological markers (biomarkers). In contrast to the AMP, the NIH does not contribute funding to BC projects; rather, projects are designed and funded by industry participants and facilitated by FNIH.⁵⁰
- **Grand Challenges in Global Health:** In 2003, the Bill & Melinda Gates Foundation (BMGF) granted \$200M to FNIH to launch Grand Challenges in Global Health, with the goal to use scientific and technological innovations to create new health tools that are effective, inexpensive to produce, easy to distribute, and simple to use in developing countries. From 2005 to 2015, the FNIH managed 20 projects and operated in 25 countries.⁵¹ The Grand Challenges model has been replicated with other partners and funders to continue to address global health and development problems.⁵²

Similarly, **NFWF** also operates and garners funding in a number of different ways:

- Cooperative agreements with 15 US federal agencies to maximize their conservation investments⁵³;
- Strategic partnerships with over 30 corporate partners to implement their philanthropic conservation strategies, including setting goals and actions and administering their environmental grant portfolio to ensure highest impact⁵⁴;
- Philanthropic funding from over 20 foundations for NFWF's conservation efforts⁵⁵; and
- Impact-Directed Environmental Accounts (IDEA) where NFWF serves as a manager and trustee for funds arising from legal and regulatory actions involving natural resources and the environment⁵⁶.

These examples illustrate a range of programs and funding models that can operate within a single organization.

⁴⁹ "Massive NIH–industry project opens portals to target validation" *Nature*, March 2019, <https://www.nature.com/articles/d41573-019-00033-8>.

⁵⁰ https://fnih.org/sites/default/files/final/pdf/Menetski_et_al-2019-Clinical_Pharmacology__Therapeutics.pdf

⁵¹ <https://fnih.org/what-we-do/major-completed-programs/grand-challenges-in-global-health>

⁵² <https://gcgh.grandchallenges.org/about>

⁵³ <https://www.nfwf.org/partnerships/federal/Pages/home.aspx>

⁵⁴ <https://www.nfwf.org/partnerships/corporate/Pages/corporatepartnerlist.aspx>

⁵⁵ <https://www.nfwf.org/partnerships/foundations/Pages/home.aspx>

⁵⁶ <https://www.nfwf.org/whatwedo/idea/Pages/home.aspx>

APPENDIX F - DETAILED PATHWAY TOWARDS FINANCIAL SUSTAINABILITY

This section builds upon the baseline assessment findings to outline a recommended pathway for FFAR to become self-sustaining as well as discuss alternative scenarios and models.

KEY CONSIDERATIONS AND APPROACH

FFAR worked with BCG to generate and assess several potential funding models. Through these discussions, a set of guiding principles emerged to inform a pathway for FFAR to become self-sustaining. These guiding principles include:

- Aim to maintain or grow FFAR's current scale of impact (currently \$40-50M a year in direct R&D grants, \$80-100M including matched funding from non-federal sources);
- Maintain independence and flexibility to fund innovative research which could transform the food & agriculture sector; however, FFAR is unlikely to be exclusively focused on such research;
- Diversify the ways in which FFAR works and is funded to enable the Foundation to achieve even greater impact.

Using these principles, several potential models were evaluated, including an option where Congress does not continue to appropriate funding. It is believed that a model in which FFAR no longer receives Congressional funding will result in FFAR becoming an organization that looks dramatically different and whose ability to deliver on the mission Congress has mandated will be severely limited. Without public funding, FFAR would operate as a small, private non-profit organization, limiting its ability to create public-private partnerships and to fund innovative research at an impactful scale.

The next section outlines a recommended pathway. Namely, a set of near- and medium-term initiatives that together comprise a plan for financial diversification and sustainability over the next ten years. More importantly, these initiatives will also advance FFAR's ability to achieve the ambitious mission that Congress envisioned with its creation. An alternative scenario with reduced Congressional funding is also considered.

Finally, a discussion on alternative models raised by stakeholders, including the possibility of establishing an endowment, pursuing royalties, and venture capital models is provided.

RECOMMENDED PATHWAY

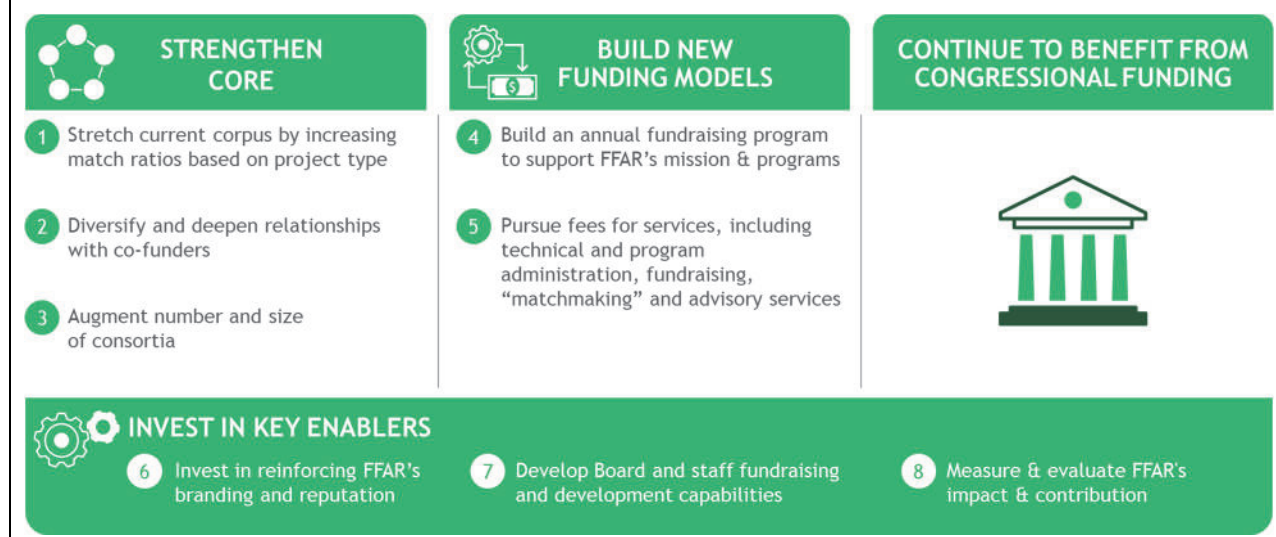
It is recommended that FFAR pursue a set of initiatives to both strengthen its core and build new funding models for diversification, which will be enabled by continued Congressional funding.

This section outlines a set of initiatives for FFAR to advance its financial sustainability while expanding the impact that FFAR achieves with the current level of public funding. In the past three years, FFAR has awarded grants at a rate of ~\$40-50M per year, which have then been matched for a total of \$80-100M in research impact per year. Our plan aspires to deliver, within ten years, a total research impact of \$150M per year with continued public funding at today's levels. This would mean that each taxpayer dollar is matched by two additional dollars from non-federal sources, all in support of the vision and mandate that Congress has put forward for FFAR.

Our plan includes a set of initiatives across four pillars:

1. **Strengthen FFAR's core model** with the goal of increasing leverage and impact of Congressional funding.
2. **Build new funding models** with the goal of scaling FFAR's model for even greater impact and establishing a strong, diversified funding base.
3. **Continue to benefit from Congressional funding** with the goal of maintaining FFAR's credibility and independence and providing even greater leverage to taxpayer dollars.
4. **Invest in key enablers** with the goal of building new capabilities and capacity to execute on strengthening the core and building new models.

FFAR's pathway to financial sustainability



Strengthen the core to increase leverage of taxpayer dollars for research impact

The three actions below represent opportunities that build upon FFAR's current value proposition and funding model to provide increased leverage for taxpayer dollars, improve diversification of co-funders, and bolster FFAR's network, partnerships, and value proposition.

- 1) **Stretch current corpus by increasing match ratios based on a segmentation of project type:** Stakeholders generally support the notion of a segmentation of research projects as a determining factor for the amount of matched funding that must be mobilized. They suggest two potential factors to be applied for projects to require a higher than 1-to-1 match from co-funders: (i) the ability of a project to provide down-stream commercial value or benefit to partners, (ii) the number of partners participating in a project or consortium, thereby permitting FFAR to garner a match at a greater multiple. To action this opportunity, FFAR will develop a segmented approach to matching in consultation with stakeholders (particularly those in industry).
- 2) **Diversify and deepen relationships with co-funders** using two principal approaches: (i) Pursue co-funders both within and out of the traditional food & agriculture value chain by defining areas of common interest (cross-cutting/multidisciplinary topics), identifying pre-competitive collaboration opportunities, and connecting research with industry; and (ii) Work to establish longer term strategic partnerships for greater financial predictability, shifting the basis of funding relationships from projects to multi-year programs or topic areas of mutual interest.

- 3) **Augment the number and size of consortia:** Lean into FFAR's growing track record of building consortia, organizing convenings, facilitating deep collaboration between industry and academia, and generating new conversations to identify research problems that can be addressed through collective action & pre-competitive collaboration with a view to advance the number and value of consortia in the food and agriculture R&D space.

Build new funding models

The two initiatives below represent new revenue generating models that will enable diversification from FFAR's current co-funding approach. These models will require building new capabilities and taking an agile "test and learn" approach to understand what will and will not work with partners.

- 4) **Launch an ongoing fundraising program to support FFAR's general programmatic mission and challenge areas, with an annual target of raising \$25M per year.** This fundraising program would seek partnerships and philanthropic contributions from foundations, corporate donors, and individuals who share the overall objectives and ambitions of FFAR to invest in the continued global scientific and operational leadership of the American Food & Agriculture system. Building fundraising capabilities of this caliber will require a number of years and the process should begin immediately.
- 5) **Pursue fee-for-service opportunities, including program administration, fundraising, "matchmaking" and other technical/advisory services.** FFAR has identified the possibility of offering its track-record and current capabilities as a service to other entities (e.g., federal agencies, foundations, industry, non-profits). While unlikely to generate a level of revenue necessary to underwrite a research finance program, this offering has the potential to help defray FFAR's operational expenses and provide even greater leverage to FFAR's public funding and any philanthropic donations.

Continue to benefit from Congressionally appropriated funding

As outlined above, continued taxpayer support is an essential component of the value that FFAR delivers to further the impact the Foundation is able to achieve with stakeholders in ensuring the continued scientific leadership of the United States in the global food & agriculture sector. Therefore, FFAR humbly seeks continued Congressional funding in the next Farm Bill at an appropriate level to complement the approaches to financial self-sustainability outlined above.

Invest in key enablers of strengthening the core and building new funding models

Finally, FFAR has noted the importance of investing to strengthen and build new capabilities – around marketing, fundraising/development, and impact evaluation – to support the initiatives outlined in the other pillars. Three actions are required:

- 6) **Invest in reinforcing FFAR's brand and reputation,** including broadly communicating FFAR's value proposition and growing track record of success to attract new partners, retain existing partners and appeal to potential donors.
- 7) **Develop FFAR's fundraising capabilities,** including developing and strengthening FFAR's network and institutionalizing development processes and tools.
- 8) **Measure and evaluate FFAR's impact and contribution,** and consistently report to stakeholders the impact, value and results of their association with FFAR.

AN ALTERNATIVE SCENARIO

In the event that public funding for FFAR diminishes, the Foundation would be severely limited in its ability to deliver on the ambition and scale of impact that Congress originally envisioned. In this scenario, FFAR's capacity to fund ambitious, potentially transformative research projects would be restricted. Indeed, stakeholders indicate that FFAR will find it much more challenging to bring partners to the table and mobilize private funding as its credibility and matching power will be weakened without the "halo effect" of its Congressional funding and mandate.

The table below summarizes FFAR's scale of impact and leverage on public taxpayer funds today, in the recommended pathway, and in the alternative scenario.

Sustainability scenarios

	FFAR today	Recommended pathway	Alternative scenario
<i>Numbers reflect annual goal in 10 years</i>	100% Congressional funding	FFAR diversifies its funding base and increases leverage on public funds, which is enabled by continued Congressional funding	Alternative scenario: FFAR receives reduced Congressional funding which will decrease FFAR's scale of impact
Congressional funding (assumes Farm Bill every 4 years)	\$50M	\$50M	\$25M
New funding models (contribution to corpus)	0	\$25M	\$15M
FFAR annual budget (excluding matching)	\$50M	\$75M	\$40M
Matching ratio (on public + private corpus)	1:1	1:1	1:1
FFAR annual R&D impact (including matching funds)	\$100M	\$150M	\$80M
Implied match on public funds	1:2	1:3	1:3

OTHER MODELS CONSIDERED

This section describes three additional funding models which FFAR's management, Board and consultants have greatly debated and considered but ultimately decided not to include in the recommended pathway for FFAR's sustainability. These exclusions have been driven by both strategic fit and executional feasibility. Further exploration and discussions are needed with various external stakeholders to develop a feasible model for application to FFAR.

Establish an endowment

One possibility explored was establishing an endowment that generates enough investment income to fund FFAR's operational and programmatic activities. To maintain the ~\$50M per year budget that FFAR has today, FFAR would need to establish an endowment with a capital base of ~\$750M to \$1B.

Two possible avenues exist for achieving an endowment of this size: (i) engaging in a significant capital fundraising campaign, and/or (ii) seeking a one-time sizeable capitalization from Congress. While an endowment of this size may be challenging to establish, FFAR could explore the possibility of fundraising to build a smaller endowment focused on underwriting operational expenses and/or specific research programs. A portion of future Congressional funds, if deemed appropriate by authorizers, may be allocated towards an endowment. Any endowment that FFAR builds would mitigate year-to-year funding volatility and enable FFAR to have a stronger financial base for its operational and programmatic activities.

As an example, the Smithsonian Institution has a \$1.5B endowment that has been built over the years beginning in the 1970s. A third of this endowment growth has occurred only in the past decade with about \$580M in endowment contributions to Smithsonian-wide programs during the same period.⁵⁷ The fund has been built with private contributions restricted to specific purposes and funds designated by the Board to function as endowments. The endowment is comprised of approximately 600 individual endowment funds that provide stable financial support for scholarships, research activities, acquisition of collections and other institutional activities.⁵⁸ Smithsonian's experience demonstrates the potentially long-term horizon of building an endowment large enough to fund all of FFAR's programmatic needs.

Earn royalties on FFAR-funded research

Today, FFAR includes a "windfall provision" in all research grant agreements for projects it funds. This provision stipulates that FFAR may be reimbursed a pre-specified multiple (e.g. 3x) of its initial grant if the project eventually generates research or technology that is adopted and commercialized by industry. Several stakeholders have raised the possibility that FFAR could seek to convert this provision from a one-time "windfall" to an ongoing "royalty" revenue stream.

An initial analysis of this possibility indicates that royalties are unlikely to be a significant source of income for FFAR in the near- to medium-term, and would likely require a number of trade-offs as well as additional investment to pursue profitably for multiple reasons, as cited by FFAR's stakeholders and benchmarks:

- Transformative, cutting edge R&D is high risk and may take years or decades to be commercialized; to see significant returns, FFAR would likely need to shift its portfolio to lower risk, more commercial-oriented projects to truly benefit.
- A good portion of FFAR's projects are generating good methods and practices for farmers and others to adopt; these projects are unlikely to yield revenue that could be captured.
- Organizations that earn significant royalties tend to conduct their own research and own the underlying intellectual property rights to that research.
- Pursuing royalties would require FFAR to invest in owning, managing and enforcing intellectual property rights, which is an expensive proposition.

A review of relevant benchmarks supports the view that royalties are unlikely to deliver a significant source of income:

- CSIRO, Australia's national scientific research agency, has invested close to \$1B in research per year for many decades but only generates about \$30M from royalties per year.⁵⁹
- The Wisconsin Alumni Research Foundation, the designated patent and licensing organization for the University of Wisconsin at Madison, applies 65% of royalty revenue against patenting, licensing and commercialization expenses, including legal expenses, leaving only 35% of the revenue to stakeholders, demonstrating the high cost of pursuing royalties.⁶⁰

However, FFAR will look to strengthen and apply its windfall clauses more consistently across projects with a view to transition from seeking a small multiple reimbursement to an ongoing revenue stream. Remaining cognizant of the limitations of the royalty model, FFAR is unlikely to be able to rely upon this as a significant source of income.

⁵⁷ Smithsonian 2017 Annual Report

⁵⁸ Smithsonian 2016 Form 990

⁵⁹ CSIRO 2017-18 Annual Report, <https://www.csiro.au/en/About/Our-impact/Reporting-our-impact/Annual-reports/17-18-annual-report>

⁶⁰ <https://www.warf.org/about-us/faqs/facts-about-warf-s-purpose-and-functions.cmsx>

Pursue a “venture capital” model

The possibility of establishing a “venture capital” model to generate additional funding for FFAR was also assessed. Three possible approaches have been considered.

- a. *FFAR could invest directly in individual start-up companies for an equity stake.* Given the early stage nature of research that FFAR funds and the risk profile of start-ups, in its current structure, FFAR would face numerous challenges consistently delivering positive returns under this model. FFAR may still choose to fund start-up companies working in important areas, but it should do so with the goal of commercializing research or new technology for broad adoption.
- b. *FFAR could invest in existing food & agriculture VC funds.* A portion of FFAR’s corpus could be invested in one or more existing food & agriculture Venture Capital funds as part of the Foundation’s investment strategy. This would have the benefit of strengthening FFAR’s relationship with VC funds (including understanding VC perspectives and R&D needs as well as improving FFAR’s ability to connect research to industry). However, investing in VC funds would represent a higher risk than FFAR’s current investment strategy and would tie up FFAR’s capital for 5-7 years at a time.
- c. *FFAR could establish its own-managed fund.* Under this model, FFAR would need to establish a separate vehicle to raise additional capital and operate a VC or impact investing fund. VC experts consulted for this effort indicated that FFAR would find it particularly challenging to hire or build the right capabilities that to source and assess deals, support portfolio company operations, and structure profitable exits. This effort would be needed in an already competitive venture capital space.

The most successful model of a publicly-established VC fund is In-Q-Tel, the strategic investor for the U.S. intelligence and defense communities established in 1999. With two decades of experience, this entity continues to rely on public funding for its venture capital activities. From 2013-2017, In-Q-Tel generated about \$80M from investments against about \$500M in public funding and 1:16 VC matching funds.⁶¹ In-Q-Tel has been able to achieve this by focusing on commercially-focused startups already backed by venture capital and with “ready-soon” technology that can be delivered for use within six to 36 months. This is much further down the R&D value chain as compared to FFAR. Investment exits at In-Q-Tel however, are over a long-term horizon, with its current portfolio including investments made in the early 2000s. Additionally, In-Q-Tel’s management includes a unique mix of entrepreneurs, technologists and investors with deep knowledge of their chosen field.

To successfully pursue venture capital as a revenue source for FFAR, the Foundation would need to build a completely new set of capabilities and revise its investment strategy to accept long-term, high-risk deployment of capital. Such an approach would likely compromise both the mandate and the near-term sustainability objectives that Congress has set forth for FFAR. VC deals should remain an option but pursued opportunistically with partners who are well-versed in the business of making such investments.

⁶¹ In-Q-Tel 2014-2017 Form 990

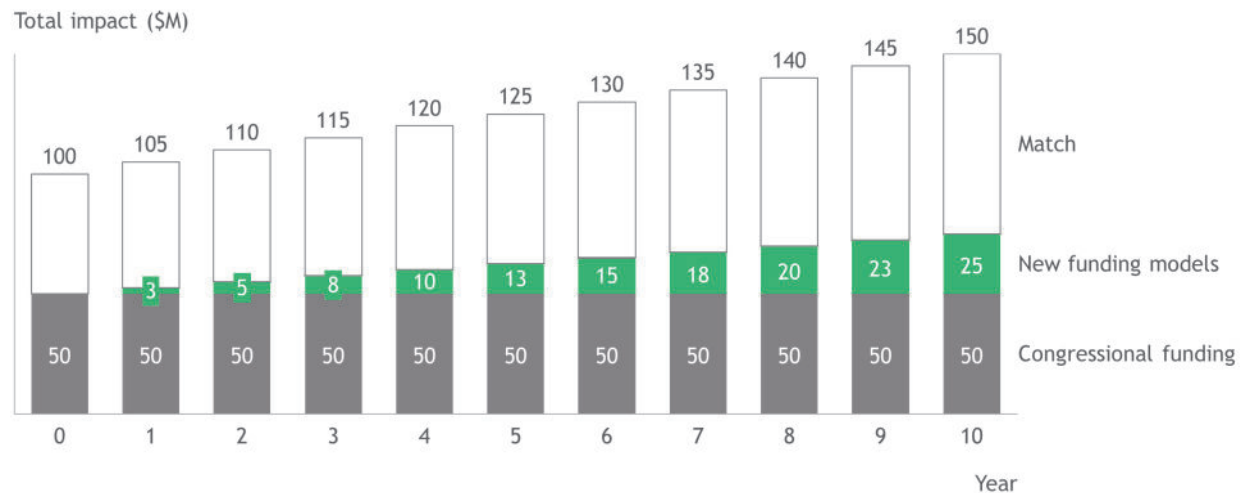
APPENDIX G – DETAILED FINANCIAL CONSIDERATIONS

Presented below are both the recommended “continued Congressional funding at current levels” scenario as well as the “reduced Congressional funding” scenario. In both scenarios, a 1:1 match ratio for research funding is assumed.

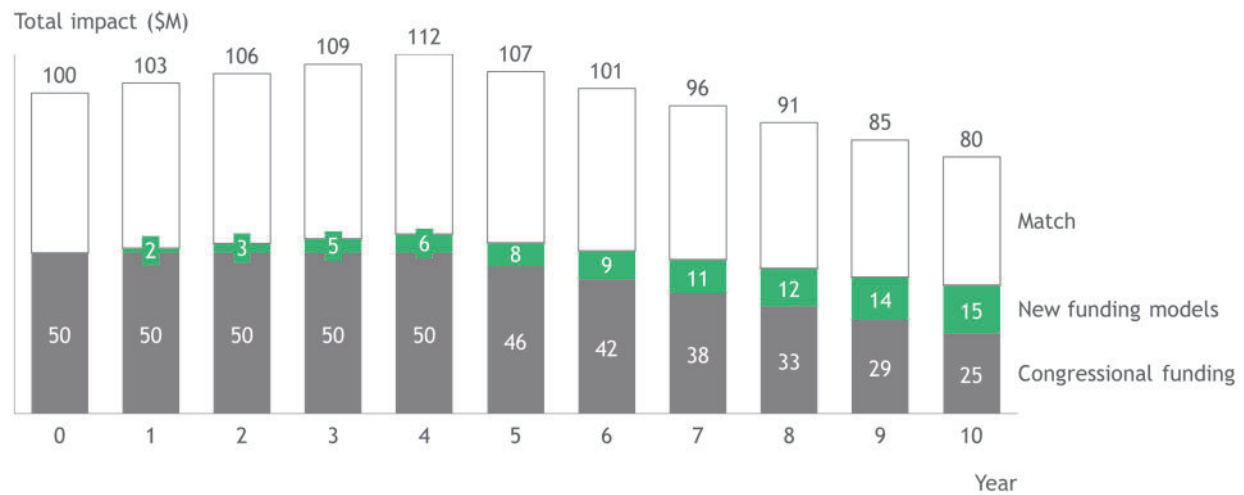
In the “continued Congressional funding at current level”, continued Congressional funding at ~\$50m per year complemented by \$25M of funding from new models is assumed.

The projections below assume revisions to public funding levels would take effect after the current Farm Bill cycle and would require a ten-year period to enable the proposed sustainability plan.

Financial projections with Continued Congressional funding at current levels + \$25M new funding models + 1:1 match on public and private funds.



Financial projections with reduced Congressional funding + \$15M new funding models + 1:1 match on public and private funds.



RISKS & CONSIDERATIONS

There are potential risks and trade-offs that FFAR will need to proactively manage to ensure it makes progress towards financial diversification while remaining true to its mission.

Risk of cessation of public funding

As discussed earlier, should this risk materialize, it will significantly diminish FFAR's value proposition and impact on research. Reduction in Congressional funding, if so desired, would need to be phased over a number of Farm Bill cycles to enable FFAR to effectively develop capabilities and execute its funding diversification strategy.

Maintaining a balanced and independent portfolio

FFAR's partnerships with industry will expand with the diversification strategy. To ensure there is no undue influence from industry actors, FFAR will install new governance structures and guardrails to ensure independence from outside influence.

Donor/co-funder restrictions on funding

The majority of FFAR's fundraised capital will likely be restricted in some way. FFAR will work collaboratively with funders and donors to develop programs within areas of mutual interest while continuing to take a science-driven approach to delivering on the mandate.

Complexity financial sustainability plans

The financial sustainability plan described herein calls for a number of major changes to FFAR's approach and capabilities, which could add substantial stress upon internal systems and cause distraction away from the primary mandate. To mitigate these risks, FFAR will (i) execute the capability building plan rapidly to build upon existing momentum, (ii) leverage external partners to accelerate execution of our plan, and (iii) work in an agile "test and learn" manner to ensure failed attempts quickly become lessons learned and do not weigh down FFAR's future.

APPENDIX H – FFAR GRANT AWARD PROCESSES

FFAR PROCESSES

The processes for awarding grants, including the selection criteria, review process, and notification process are outlined on the Grants section of the FFAR website. An overview of the grants process is provided on the website at <https://foundationfar.org/about-us/how-we-work/>. Specifically, the selection criteria and information about the notification process can be accessed on the FFAR website at <https://foundationfar.org/grants/applicant-resources/>.

FFAR is required by law to produce an Annual Report that describes the Foundation's activities for the past year, provides information on the organization's operations and financial conditions and outlines upcoming programs. As part of the 2018 Annual Report, FFAR created the graphics below to better communicate how FFAR develops scientific programs and awards grants through these programs, as well as the ways in which we award funding.

How We Work: Developing Research Programs

FFAR builds scientific programs to advance agriculture research on specific topics and funds innovative projects through those programs.



1: Concept Development

Ideas for research programs stem from various sources:

- USDA
- Commodity and farm groups
- Research organizations and conferences
- Convening events
- FFAR stakeholders
- FFAR staff
- FFAR Board of Directors
- FFAR Advisory Councils

FFAR's Scientific Program Directors ensure alignment with organizational priorities. The respective Scientific Program Director consults with the USDA to ensure the program does not duplicate efforts. Program ideas are also evaluated based on various other factors, including:

- Mission alignment
- Innovation
- Potential farmer impact
- Actionable outcomes
- Research needs
- Interest from the private sector

FFAR's Executive Director reviews program concepts and either rejects or accepts the concept.



2: Concept Clearance

Each FFAR Challenge Area has an Advisory Council, comprised of external scientists, agriculture practitioners and stakeholders. The Advisory Council reviews and determines whether the prospective program concept aligns with the relevant FFAR Challenge Area and will yield actionable results that solve critical food and agriculture challenges.

A program may be further refined through conversations and input occurring at multiple venues, including convening events.



3: Program Approval

The program is presented to FFAR's Scientific Program Committee, a subset of Board members, for final approval. Scientific programs may be rejected, invited to revise and resubmit, or approved. If approved, a program concept becomes a FFAR program. Once a program is approved FFAR staff announce the program publicly.

How We Work: Funding Research

Once the research programs are established, FFAR announces the program publicly and funds innovative projects through those programs.



Application Notification and Submission

Applicants can view and apply for funding opportunities within specific research programs on the FFAR website. The Foundation website includes information about each opportunity, including eligibility conditions, application procedures, research requirements, review criteria and the timeline. All research applications must be submitted through the Foundation's online system.



Application Review

All submitted proposals undergo a rigorous review process including reviews by External Peer Reviewers and FFAR's Advisory Councils.



External Peer Review

Applications are evaluated by an independent External Peer Review panel comprised of scientific experts in the respective topic area. Peer Reviewers judge proposals based on select criteria that may include:

- Scientific or technical merit
- Project strategy and feasibility
- Potential impact and relevance
- Innovation



Advisory Council Review

Advisory Councils are comprised of individuals with significant industry or scientific expertise in each of FFAR's Challenge Areas. Advisory Councils consider applications based on:

- Alignment with FFAR's priorities
- Potential impact and relevance
- Merit across topic area

FFAR's Scientific Program Director compiles the results from both the External Peer Review and Advisory Council Review and presents recommendations to FFAR's Executive Director.



Executive Director Approval

FFAR's Executive Director reviews the recommendations and determines final project approval.



Projects are Awarded

Once a project agreement is finalized with the grantee and matching funders, FFAR publicly announces the award. FFAR requires that research teams make their data accessible to the public.

Grant Types:

- Requests for Application - FFAR issues a Request for Application (RFA) to solicit ideas from the broadest group of researchers. Some of FFAR's programs issue RFAs annually and others are a one-time opportunity. The highest quality proposals in terms of technical merit and impact are selected for funding through a vigorous scientific review process.
- Prizes - FFAR offers prize competitions to inspire excellence in food and agriculture science or to solve an imminent problem. Prizes are awarded to individuals or organizations who meet the prize criteria and solve the food and agriculture challenge.
- Direct Funds - When FFAR knows of a specific individual or organization that is well-suited to conduct the necessary research, a research proposal may be directly solicited from that organization. The proposal is subject to the same rigorous scientific review process and matching funding requirement as other proposals.
- Consortia - Food and agriculture research can be financially risky. FFAR establishes precompetitive consortia to address common problems recognized across the industry, where solutions are beneficial to all. Consortia participants jointly determine research priorities, pool resources and knowledge, and share research results, which also become public.

Typical Award Criteria – FFAR evaluates and scores program proposals based on four categories of weighted review criteria:

- Novelty, Innovation and Originality (30%)
- Impact and Outcome (25%)
- Technical Merit and Feasibility (30%)
- Partnerships (15%)

Customized criteria and changes in weighting occur based on the program priorities and are outlined in each Request for Application. FFAR requests reviewers provide comments on criteria for evaluation after each review. This allows FFAR to continually improve the evaluation process.

The review criteria categories will be added to the FFAR Stakeholder Notice on the website for transparency. Based on feedback from stakeholders these criteria and their weights may continue to evolve.

APPENDIX I – FORMING FFAR RESEARCH PRIORITIES

The Foundation originally established research priorities, known as the FFAR Challenge Areas, in 2016. FFAR develops scientific programs and funds grants through these programs to advance research in this research areas. The original Challenge Areas included:

- Healthy Soils, Thriving Farms
- Protein Challenge
- Food Waste and Loss
- Overcoming Water Scarcity
- Urban Food Systems
- Making My Plate Your Plate
- Forging the Innovation Pathway to Sustainability

The Foundation reevaluated the Challenge Areas in 2018 to be more streamlined and better reflect research gaps, and is now furthering research in these six areas:

- Soil Health
- Sustainable Water Management
- Next Generation Crops
- Advanced Animal Systems
- Urban Food Systems
- Health-Agriculture Nexus

Before changing the Challenge Areas, FFAR sought input from the Board of Directors, advisory councils, stakeholders and the USDA. The Foundation held an open forum to solicit public input during the annual Public Conversation.

FFAR hosts a townhall-style Public Conversation annually. FFAR's Public Conversation is an opportunity for the public and members of the food and agriculture community to hear from the Foundation's leadership. This gathering is also an opportunity for members of the food and agriculture community, and for the public, to comment on FFAR's strategic direction and offer input on the Foundation's research priorities. The Public Conversation is attended by FFAR's Board of Directors and staff, members of the food and agriculture community, the media, Congressional staffers and members of the public.

FFAR held the 2018 Public Conversation on October 12, 2018 at the International Food Policy Research Institute in Washington, D.C. Attendees heard from Board Chairman Mark Keenum, Ph.D. and Executive Director Sally Rockey, Ph.D. on the Foundation's recent accomplishments and upcoming work. The presentations included an overview of the FFAR model, research results to date and proposed changes to the Challenge Areas for 2019. Fifty members of the community attended the 2018 Public Conversation and seven individuals provided remarks which then sparked an interactive conversation.

APPENDIX J – ENGAGING THE PUBLIC

FFAR communicates regularly with the media, stakeholders and Congressional staff through press releases, social media, an e-newsletter and a generic email address soliciting public questions and input.

FFAR distributes press releases announcing new grants, results, events and upcoming funding opportunities. These releases are distributed via email and posted on the FFAR website in the News section, which can be accessed at <https://foundationfar.org/news-and-updates/>. FFAR also uses social media to update the public on the latest happenings.

FFAR publishes a monthly e-newsletter with information about recent grants, funding opportunities, conferences and highlights from matching funders.

The Foundation also hosts a generic email address, communications@foundationfar.org, to allow anyone to submit questions or ideas. This inbox is monitored regularly, and staff strives to provide prompt responses.

FFAR publishes the 2018 Annual Report on May 31, 2019. The Annual Report was emailed to FFAR stakeholders and members of the Committee on Agriculture of the House of Representatives and the Committee on Agriculture, Nutrition, and Forestry of the Senate. FFAR also posts all Annual Reports on the website at <https://foundationfar.org/about-us/governance/>. Additionally, printed copies are available upon request.

FOSTER OUR FUTURE


FFAR held its inaugural Foster Our Future event on February 5, 2019 in Washington D.C. This exciting food and agriculture event featured:

- Demonstrate game-changing research technology and innovation
- Inspire by bringing scientific breakthroughs to life
- Celebrate the impact food and agriculture has on consumers and producers
- Showcase research talent
- Highlight the importance of continued research investment

The event included interactive exhibits and inspiring discussions. Participants saw, heard and interacted with displays highlighting research FFAR supports and other scientific breakthroughs. The next Foster Our Future event will be held February 5, 2020.

Finally, FFAR provides an extensive set of governance and informational documents on the website. These include:

- | | |
|-------------------------------|---|
| • Founding legislation | • Intellectual Policy |
| • Articles of Incorporation | • Annual reports |
| • By-laws | • Lists of awarded grants |
| • Strategic Plan | • Active and past requests for applications |
| • Annual IRS 990 tax returns | • List of contributors |
| • Conflict of Interest Policy | |
| • Contributor Guidelines | |



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