

# TECHNICAL BRIEF: USAID TO RE-ENGAGE IN SUPPORTING NATIONAL AGRICULTURAL RESEARCH SYSTEMS

## Introduction

Agriculture is back on the policy agenda in developing countries after a long period of relative neglect. Concerns that have led to this reverse in donor as well as government policy include: (i) A persistently high concentration of poor in the rural areas; (ii) Rising food prices compromising the gains in poverty and hunger reduction achieved earlier; and (iii) Turbulence in terms of climate (global warming) and markets (bio-energy competing with food). In this context, USAID has launched its Feed the Future (FTF) program, which aims to address the root causes of hunger and poverty and which recognizes the importance of agricultural research as a critical (although not sufficient) input towards the solution in the longer term. Moreover, it is an input that has been relatively underexploited (see Box 1). While international and regional agricultural research initiatives are definitely needed, the weakest link in getting improved technologies to farmers and others in the food system is a lack of national agricultural research (and extension) capacity.

### Box 1: High returns suggesting underinvestment

Ex post rate-of-return studies on agricultural research investments conducted all over the world report an astonishingly high average return in the order of 40-60% (Alston et al. 2000). Despite some concerns regarding the representativeness of the studies (there is a natural tendency to pick winners for these studies) and the methodologies used to measure the contribution of R&D investment (e.g., the impacts of research spill-ins are often attributed to own research), it is generally believed that also after correction for these imperfections, the average rate of return will exceed the social rate by quite a wide margin. All along, these high rates of return have been the basis for the argument (first put forward by Vernon Ruttan in 1980) that there is serious underinvestment in agricultural research. In other words, the potential of agricultural research to raise agricultural productivity, increase food security and reduce poverty has been very much under-exploited.

To assist Missions address this challenge, the Bureau for Food Security (BFS) has made available this Technical Brief, an Issues Paper,<sup>1</sup> an Annotated Literature Review, and a Training Module. They all can be found on USAID's website. Input to these documents comes from research incorporating learning over decades of support by governments, donors, and others for national agricultural research systems, and input from a selected group of international experts in this area that shared their learning through participation in a Roundtable discussion held in Washington, DC during March 2013 as well as by responding to a survey.

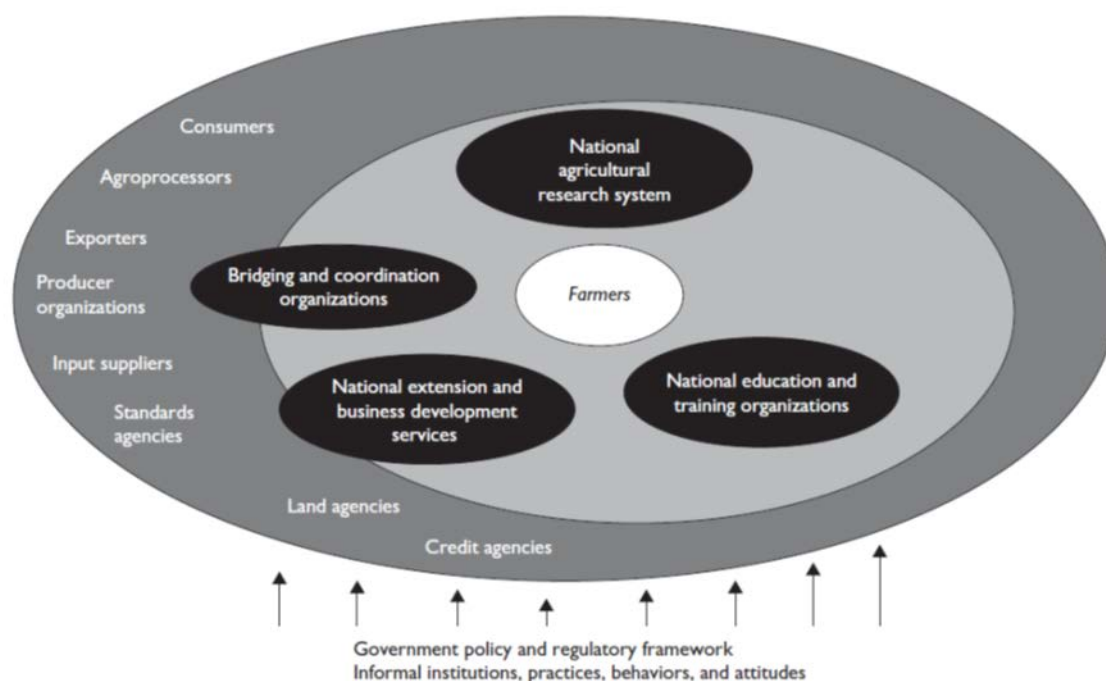
## From NARS to Agricultural Innovation Systems

Roundtable participants agreed that in assessing the status of a NARS it is helpful to do so from a perspective of a broad agricultural innovation system. Such a system spans many actors (see Figure 1);

<sup>1</sup> Anderson and Roseboom. 2013. Towards USAID Re-engaging in Supporting National Agricultural Research Systems In the Developing World. USAID/BFS.

**public** such as research organizations at levels from provincial to international (including, of course, national research and higher education entities) and advisory services; **private** such as farmers and their organizations, as well as farm input suppliers and farm output processors and other actors in agricultural value chains; and **community**-based and non-government organizations. An effective national agricultural research institute (NARI), for instance, must work synergistically with all these other partners as well as advisory services, although all too often it seems such cooperative activity is insufficiently undertaken or even absent. Managers face on-going challenges in effectively fostering the linkages that can enable the synergies to be exploited. Crafting appropriate governance arrangements is important in setting favorably the prospects for collaborative progress.

**Figure 1: An agricultural innovation system and its key actors**



Source: World Bank (2012)

## Structural change naturally affects NARS

Just as the economic and political environment in which NARS function evolves over time, so too must the elements of NARS themselves. **New skills and facilities are required** in research entities if they are to respond to changing demands for research products to drive productivity growth in farming systems, and new managerial arrangements in such entities are required to enable such responses to be made efficiently. Research entities typically require dynamic adjustments in their resources to meet adequately the **emerging scientific opportunities** and the imperatives for reducing poverty, protecting the environment and assisting farmers in adapting to changing climate. Participants in the Roundtable noted that **many NARS have not been doing well in taking up these many challenging adjustments**, and need assistance in moving forward. It was argued that among the most critical aspects of NARS deserving

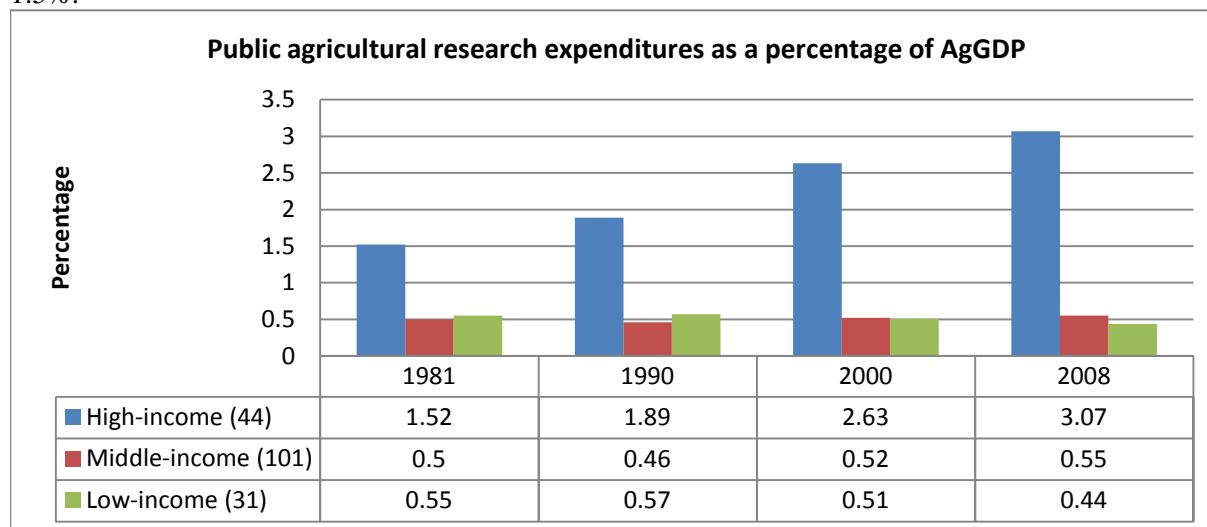
strong support were fostering leadership and advancing management skills, areas that had been focal thrusts at ISNAR<sup>2</sup> and seemingly warranting a new champion.

## Re-energizing investment in agricultural research

Part of the explanation for the less than ideal situation observed in many parts of the world is the **low levels of public investment in NARS** that persist (see Box 2), whether driven by tight fiscal realities and/or lack of political will to fund public research entities. At the same time, private and public-private forms of investment in agricultural R&D are also very much underdeveloped due, in part, to absent or weak intellectual property protection and enforcement.

### Box 2: Agricultural research intensity

For the past 30 years, investment in public agricultural research has hovered around 0.5% of AgGDP in low- and middle-income countries. In contrast, high-income countries have doubled their intensity ratio over this period. In relative terms, they now invest six times more in public agricultural R&D than low- and middle-income countries do (up from three times in 1981). A large middle-income country that forms a clear exception from the average picture is Brazil. It has persistently invested between 1-2% of AgGDP in agricultural R&D over the past 30 years and is worldwide recognized as a lead country in (tropical) agricultural research. The overall message from this benchmarking is that low- and middle-income countries should raise their investment in public agricultural research substantially. Although there is no sound theoretical underpinning, a minimum investment target of 1% of AgGDP is generally accepted. The GCARD Road Map (GFAR 2011) recently recommended an investment target of 1 to 1.5%.



Source: Beintema et al. (2012)

In many countries there has been something of a “boom or bust” in NARS development as donor support has waxed and waned, and since research is such an intrinsically long-term process, instability in resource

<sup>2</sup> ISNAR is the acronym for the International Service for National Agricultural Research, a CGIAR Center that operated in The Hague from 1980 to 2004 and as a Program of the International Food Policy Research Institute (IFPRI) subsequently until 2009 when it was reorganized and renamed as the Knowledge, Capacity and Innovation Division of IFPRI. <http://www.isnar.cgiar.org/>

provision compromises the productivity expected of R&D investment. A crucial part of the situation pertains to the diverse but often too limited contributions of higher education institutions within the NARS. Another part of the explanation is attributable to insufficient exploitation of persuasive evidence of the achievements of past investment in agricultural research. It is imperative for all concerned to do a better job of assessing the diverse impacts of investments in NARS and communicating to stakeholders (perhaps through more effective journalism, among others) the achievements, irrespective of the source of funding of such investment. Since this is a remarkably under-attended aspect, USAID can usefully target both capacity development and technical assistance in this domain, which can assist in both accountability and learning aspects of NARS development.

## Re-visiting NARS organization and management

The performance of a NARS depends on: (i) the **organization and management** qualities of the individual NARS actors; (ii) the interaction and coordination between NARS actors; and (iii) the interaction and coordination with external partners, including agricultural advisory services, farmer organizations, NGOs, input suppliers, processors, etc. There was broad consensus at the Roundtable that many NARS actors are underperforming due to poor organization and management. Sometimes even the most basic processes (financial administration, planning, M&E, etc.) are not organized and managed efficiently and suffer from lack of maintenance. Weak NARS actors usually also result in a lack of systemic coherence (i.e., poor internal and external linkages).

Arguably, there has been global underinvestment in this domain. A major endeavor was the effort through the Consultative Group on International Agricultural Research (CGIAR) with the creation of ISNAR, in its two incarnations. Observers, including those participating in the Roundtable, have wide-ranging opinions about the success or otherwise of the “global” public investment in ISNAR. But what is uncontroversial is that many of its products are highly worthy and have enduring value that should not be ignored in contemplation of support for NARS. The Literature Collection prepared in conjunction with the Issues Paper presents some of this cogent material in summary form and electronic links to most of the documents, including training materials.

## Re-considering the best approach to agricultural research

Fashions in agricultural research have varied greatly over recent decades as stakeholders, ranging from donors to concerned NARS leaders, have sought to learn from experience and to find ways to make future research efforts more successful than those of the past. One issue is that of finding the right **balance** between **reductionist** and **holistic** research approaches. Reductionist research approaches (i.e., the tendency to break complex problems up into ever smaller components) are well established in scientific disciplines – they are the norm. This makes it often difficult for holistic research approaches to capture support and recognition. The two approaches are often portrayed as competing, while they should be complementary. Many experts point to the need for more **systemic innovations** in agriculture and hence greater investment in holistic research approaches. For decades, **farming systems** research has been the principal holistic approach in agricultural research. In recent years, however, the attention has shifted more towards a **value chain** research approach. Although their focus differs, what both holistic approaches have in common is strong stakeholder participation.

## Re-thinking NARS capacity building

The core of the USAID concern addressed in the Issues Paper, **NARS capacity development**, is taken up under two themes on which the Agency has been outstandingly active in the past, namely, **human capacity and institutional capacity**. USAID’s ability to call upon the extensive resources of the Land

Grant Universities was central to providing much of the advanced training of the research staff of the NARS built up with much other institutional support by the Agency in the 1960s and following decades. But with the flagging investment in many NARS in recent times, there has been **insufficient maintenance of human and institutional capacity as well as infrastructural resources**. These resources include libraries and laboratories, and socio-economic and policy research units, as well as insufficient investment in new facilities such as computers, information and communication technologies and modern laboratory equipment.

Naturally **the needs for strengthening capacity vary greatly according to country circumstance**. Large economies can readily enough afford to maintain and develop their NARS, and some do so handsomely, such as Brazil and China. Indeed, such strong NARS can and do provide significant “South-South” assistance in agricultural research. Many smaller economies will never be able to afford NARS that are in any sense comprehensive. Rather, they should **focus on building capacity to capture spill-ins from the work of others**, whether the “others” hail from nations of the North or South, the CGIAR or Regional entities, or in the private sector, including multinationals. Some aspects of capacity are not expensive and rather merely require political will, such as updating and harmonizing regulations pertaining to trade in seed and agricultural chemicals. Other aspects, such as implementing effective capacity for managing biosafety are more costly and may require external assistance for effective implementation. But relevant national capability is critical to achieving growth in agricultural productivity everywhere, and needs for building capacity must be addressed accordingly.

## Reviewing the status of NARS

An important first step in contemplating appropriate assistance for capacity strengthening is a cogent **assessment of the situation** that prevails. Such assessment itself may well be assisted by USAID Missions, which can help national authorities arrange for frank appraisal of the status of the NARS. In a few cases (e.g., Pakistan) such assessments have recently been made with USAID assistance, in others International Financial Institutions such as the World Bank have conducted relevant updates (e.g., Chile, Sri Lanka, and Uruguay). In most cases the data assembled by the Agricultural Science and Technology Indicators (ASTI) initiative can form a ready basis for developing an assessment. These data already document many contemporary problems, such as the crisis emerging with the imminent or recent retirement of many senior scientists in NARIs that were supported in earlier enlightened times.

An assessment should cover all aspects of the NARS that affect its performance through seeking good answers to questions such as the following. Do the public NARIs have the ability to attract and maintain the best scientists, which may be partly related to noncompetitive salaries and partly to unfavorable work environments? Are procedures adequate for identifying in agricultural systems those research problems of high priority and properly in demand? **Are incentives in place** to permit NARIs to respond to demand? Is appropriate use made of performance-based contracting? Are there adequate incentives to work with farmers and other value-chain actors to solve significant problems? Has the “right” level of decentralization been reached in the NARS arrangements? Is the NARI operating budget sufficient? Can a good and well-motivated NARI scientist effectively attract the needed budget? Can public research entities work effectively with private ones? And work with universities, including those in the US? How effective are the **arrangements for monitoring and evaluation**? How well is research-based information shared with stakeholders?

In tackling such non-trivial questions it will be helpful for an assessment team to interact with analysts from the **Ministry of Finance** or equivalent body, perhaps even through team membership, given the importance of such bodies in allocating resources for the public elements of a NARS. Parliamentarians should also be engaged. Similarly, and especially if an assessment is to include appraising the possibilities of alternate sources of funding for research, it would be useful for the team also to engage with **farmer/**

**farm-industry organizations** that could well be direct sources of funding (e.g., as in Uruguay). Some novel research-funding opportunities are not necessarily specific to agriculture. For example, general science, technology and innovation policies can play an important role in creating new funding opportunities, with notable examples in Brazil and Chile.

The scope of NARS assessment should also extend to the higher education sector. This is not only because national universities will be crucial for training the future research workers of the NARS but also because (perhaps largely through access to competitive research grants) the **universities should be playing an active role in the research enterprise of the NARS**. Universities will likely also play important parts in research collaboration that USAID may support between NARS and advanced research institutes in the US and elsewhere. Long-standing collaborative activities such as the CRSPs that have been supported by the Agency should, of course, be continued.

## The time to act has come

It is timely indeed for **USAID to re-engage in supporting NARS**, as most NARS in the developing world are sorely in need of assistance. Some assistance has been on-going, as in the indirect help via the CGIAR Centers and Programs, although in recent decades little of this has been for human-capacity development per se, a theme that might well be revisited by CGIAR decision makers.

Most future USAID assistance (including for work at Regional level) is destined to be delivered by USAID Missions through national programs. It is to be hoped that Missions will focus on countries that commit to institutional reforms and where the enabling environment for agricultural research is supportive. Naturally, due account of what other donors are doing and proposing to do in this domain will also have to be taken in order to avoid duplicative effort and to maximize potential complementarities. Missions must develop their own mechanisms for identifying potential priorities for investing in agricultural development, including **assessing the needs for NARS capacity enhancement**. In so doing it is hoped that the materials assembled for the Roundtable process will be helpful in such planning for productive engagement and investment.

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