

NEPAL

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KEY INDICATORS, 2000–2012

Total Agricultural Research Spending	2000		2009		2012
Nepalese rupees (million constant 2011 prices)	965.8		996.0		1,314.3
PPP dollars (million constant 2011 prices)	39.2		40.4		53.4
Overall Growth		3%		32%	
Total Number of Agricultural Researchers					
Full-time equivalents (FTEs)	391.2		374.6		403.4
Overall Growth		-4%		8%	
Agricultural Research Intensity					
Spending as a share of agricultural GDP	0.28%		0.25%		0.28%
FTE researchers per 100,000 farmers	4.74		3.55		3.57

Notes: Research conducted by the private for-profit sector is excluded from this factsheet due to lack of available data. Acronyms, definitions, and an overview of agricultural R&D agencies are provided on page 4.

► Agricultural R&D investment and human resource capacity in Nepal grew in recent years in response to increased government funding; nevertheless, much more is needed to address the agricultural sector's many critical challenges.

► NARC is by far the largest agency conducting agricultural R&D in Nepal, accounting for more than 80 percent of the country's agricultural R&D investments and human resource capacity in 2012.

► Although Nepal's share of female agricultural researchers increased from 9 percent in 2009 to 13 percent in 2012, women remain extremely underrepresented in agricultural R&D, especially considering they constitute more than 60 percent of the country's agricultural workforce.

FINANCIAL RESOURCES, 2012

Spending Allocation

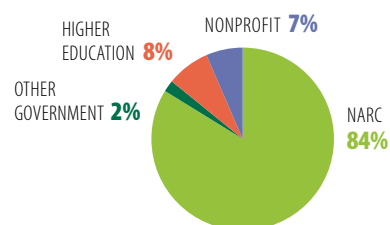
Salaries	36%
Operating and program costs	53%
Capital investments	11%

Funding Sources

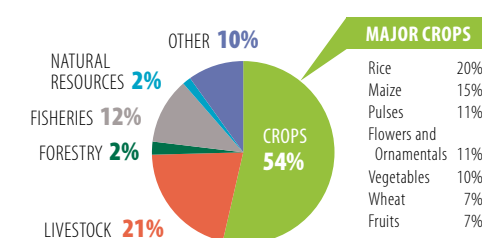
Government	86%
Donors and development banks	14%

Note: Shares are based on data for NARC only.

INSTITUTIONAL PROFILE, 2012



RESEARCH FOCUS, 2012



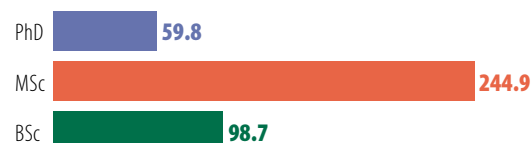
MAJOR CROPS	
Rice	20%
Maize	15%
Pulses	11%
Flowers and Ornamentals	11%
Vegetables	10%
Wheat	7%
Fruits	7%

Notes: Major crops include those that are the focus of at least 5 percent of all crop researchers; 19 percent of total crop researchers focused on a wide variety of other crops.

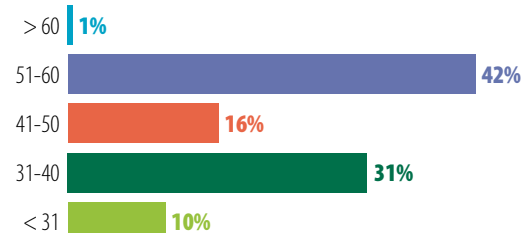
RESEARCHER PROFILE, 2012

87% MALE  **13% FEMALE** 

Number by qualification (FTEs)



Share by age group (years)



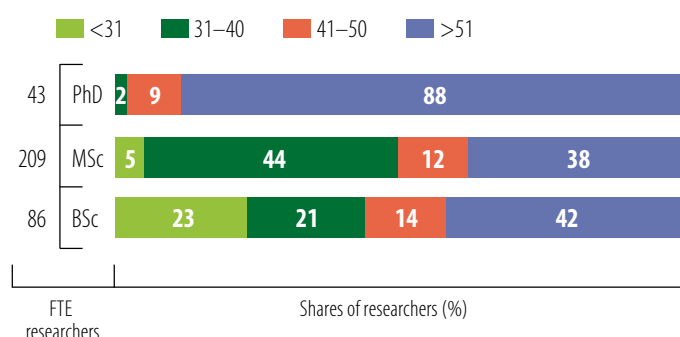
CHALLENGE

- ▶ Protracted political instability caused long-term recruitment restrictions that were finally lifted in 2010. The restrictions significantly distorted the age distribution of NARC's pool of scientists, such that the vast majority of the council's PhD-qualified researchers will retire in the next five years. Low salaries, limited training opportunities, an inequitable system of staff promotion, and a lack of performance-based incentives have caused many younger researchers to seek more attractive opportunities both in-country and abroad.

POLICY OPTIONS

- ▶ A system of regular, vacancy-based recruitment needs to be established through the Public Service Commission. In addition, large-scale training for young researchers is urgently needed. Raising the retirement age from 60 to 63 years (in line with universities), or even higher, would allow more time for senior researchers to train and mentor their younger colleagues. The government also needs to address the inequitable system of staff promotions and introduce performance-based incentives to attract, motivate, and retain scientists over time.

Distribution of NARC researchers by age bracket, 2012



▲ Close to 90 percent of NARC's PhD-qualified researchers are in their 50s, approaching the mandatory retirement age of 60. It is important that the young MSc-qualified researchers recruited in recent years are given the opportunity to upgrade their qualifications so that NARC can maintain an appropriately trained pool of agricultural scientists into the future.

Number of newly recruited researchers and technical officers at NARC

BY DEGREE	2009	2010	2011	2012	2013
MSc	0	55	24	0	0
BSc	0	11	0	23	0
BY AGE BRACKET					
40 years or younger	0	66	24	23	0
BY GENDER					
Female	0	14	7	3	0
Male	0	52	17	20	0
TOTAL	0	66	24	23	0

Number of NARC researchers who received PhD training

BY LOCATION	2009	2010	2011	2012	2013
In Nepal	12	1	1	2	7
In another Asian country	0	1	0	1	3
In a high-income country	1	5	2	1	1
TOTAL	13	7	3	4	11

Note: The MSc-qualified recruits hold official research positions. The BSc-qualified recruits are technical officers (junior research support staff).

▶ DIFFICULTIES ATTRACTING AND RETAINING TALENTED YOUNG SCIENTISTS

NARC and Tribhuvan University are not considered attractive employers to young scientists because their salary levels are two to ten times lower than those offered by NGOs or the private sector. Although NARC has attempted to introduce a series of monetary and nonmonetary incentives, none of these measures have been approved by the Ministry of Finance. Many young and talented agricultural scientists have left Nepal to pursue opportunities in the United States or other industrialized countries, and they are unlikely to return.

Another major disincentive to a career in agricultural R&D in Nepal is the fact that a PhD qualification has no impact on salary levels. Without a monetary incentive to pursue PhD training, Nepal's most talented agricultural researchers will continue to be lured into other sectors or abroad. The majority of NARC researchers undertaking PhD training under Tribhuvan University's Plan B scheme (which is research- rather than course-based) are in their 50s, and some will have even retired before completing their degrees. This is not the most efficient use of resources. Moreover, although Plan B increases the number of PhD-qualified researchers in the short run, it hardly addresses capacity constraints long-term.

▶ NARC'S INEQUITABLE SYSTEM OF PROMOTIONS

A key issue underlying the inequity in NARC's system of promotions stems from the process by which the council was originally staffed. At the time of NARC's establishment as an autonomous research agency in the 1990s, whoever applied for research positions was accepted, regardless of their discipline or position. Compounding the issue, that inequitable structure has remained unchanged over time and can only be modified by the council—which to date it has never done. As a result, NARC's position structure and distribution across disciplines and locations is not based on current needs and continues to be inequitable. Attempts have been made to update the structure, but they have not been executed.

Recently, a handful of senior scientists in a very select set of disciplines were promoted. This had a detrimental effect on the morale of senior researchers with the exact same qualifications, experience, and years of service, but whose disciplines were not considered for promotion.

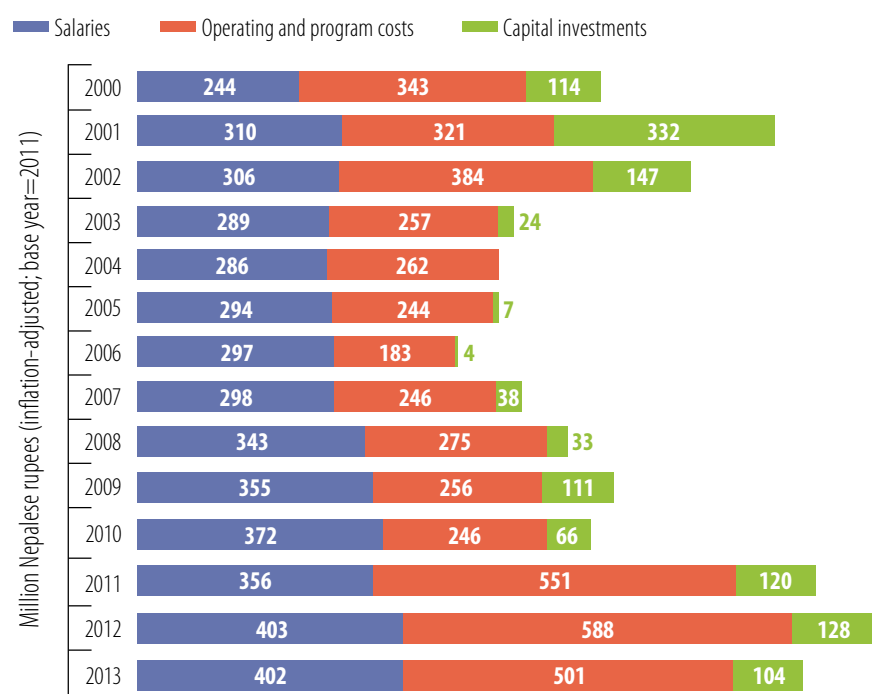
CHALLENGE

- ▶ Despite the recent increase in agricultural research spending, underinvestment in agricultural R&D is pervasive. In 2012, Nepal invested 0.28 percent of its AgGDP in agricultural R&D, which is very low considering the country's low agricultural productivity, rapid population growth, high levels of poverty and malnutrition, and rising agricultural imports—all in the context of adverse climate change impacts.

POLICY OPTIONS

- ▶ The government needs to clearly identify its research priorities and allocate funding for the effective implementation of research programs. Rehabilitation of research equipment and infrastructure is urgently needed, donor funding needs to be more closely aligned with national priorities, and private participation in R&D needs to be stimulated. In addition, sub-regional linkages need to be innovatively developed and enhanced to maximize synergies and efficiencies.

NARC's total expenditures by cost category, 2000–2013



◀ The 2002 completion of the World Bank–funded Agricultural Research and Extension Project prompted sizable contractions in agricultural R&D spending.

◀ With the return of peace in 2006, NARC's spending levels rebounded. Both government and donor funding increased considerably between 2011 and 2013.

▶ HIGHER CAPITAL INVESTMENT NEEDED

Many NARC stations and laboratories are constrained in their research efforts due to outdated research infrastructure; equipment that has fallen into disrepair, insufficient access to vehicles to conduct field research, frequent power cuts that disrupt laboratory research, unreliable Internet access, lack of office space, and lack of up-to-date computer equipment and software. The situation is particularly severe at stations located outside the Kathmandu Valley. In recent years the World Bank funded the acquisition of some modern equipment under the Seed Safety Net Project and Zoonotic Disease Control Project. To facilitate future acquisitions, the government should simplify the highly complex and bureaucratic procurement procedures associated with building construction and the purchase of capital goods.

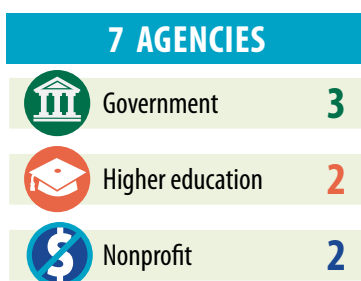
Number of new varieties released by NARC through in-house research, 2007–2012

COMMODITY	VARIETIES RELEASED
RICE	12
WHEAT	6
MAIZE	5
LENTILS	2
CHICKPEAS	2
POTATOES	2
FODDER	2
COWPEAS	1
TOMATOES	1

◀ NARC, which is the main agricultural R&D agency involved in crop breeding in Nepal, released 31 new crop varieties and 2 new fodder varieties during 2007–2012. NARC's cereal breeding program is comparatively strong but has yet to produce any hybrid varieties. In contrast, NARC has no vegetable breeding programs. Moreover, Nepal lacks the large seed companies needed to commercialize the new varieties released by NARC.

OVERVIEW OF NEPAL'S AGRICULTURAL RESEARCH AGENCIES

Seven agencies conduct agricultural R&D in Nepal. NARC (338 agricultural FTEs in 2012) is the largest by far. It conducts research related to crops, livestock, aquaculture, natural resources, postharvest issues, and agricultural economics, together with assisting the national government in formulating agricultural policies. NARC is headquartered in Kathmandu and operates 5 regional agricultural research stations, 13 agricultural research stations, and 15 commodity research programs located across the country's various agroecological zones. NAST (6 FTEs) and DFRS (2 FTEs) are the only other government agencies involved in agricultural R&D. Most of NAST's research focuses on areas such as biofertilizers, biopesticides, and molecular studies, whereas DFRS is engaged in limited forestry research. Compared with many other countries in South Asia, NGOs play a comparatively important role in agricultural R&D in Nepal: LI-BIRD (22 FTEs) conducts research mainly in natural resources, biodiversity, and ecosystem services, whereas FORWARD (5 FTEs) conducts research in a variety of areas, including crops, dairy, and socioeconomics. Until recently, Tribhuvan University was the only higher education agency involved in agricultural R&D in Nepal. Research at the university's IAAS (23 FTEs) focuses on crops, livestock, and fisheries, whereas IOF (8 FTEs) focuses on forestry. In 2014, IOF and parts of IAAS were restructured under the newly established Agriculture and Forestry University. The only private company identified as performing agricultural R&D is a livestock feed company, Probiotech Industries; its R&D activities are reportedly minimal, however.



 For a complete list of the agencies included in ASTI's dataset for Nepal, visit www.asti.cgiar.org/nepal.

ASTI DATA PROCEDURES AND METHODOLOGIES

- ▶ The **data underlying this factsheet** were predominantly derived through primary surveys, although some data were drawn from secondary sources or were estimated.
- ▶ **Agricultural research** includes research conducted by the government, higher education, and nonprofit sectors; research conducted by the private for-profit sector is excluded due to lack of available data.
- ▶ ASTI bases its calculations of human resource and financial data on **full-time equivalent (FTE) researchers**, which take into account the proportion of time staff actually spend on research compared with other activities.
- ▶ ASTI presents its financial data in 2011 local currencies and **2011 purchasing power parity (PPP) dollars**. PPPs reflect the relative purchasing power of currencies more effectively than do standard exchange rates because they compare prices of a broader range of local—as opposed to internationally traded—goods and services.
- ▶ ASTI estimates the **higher education sector's research expenditures** because it is not possible to isolate them from the sector's other expenditures.
- ▶ Note that, due to **decimal rounding**, the percentages presented can sum to more than 100.

 For more information on ASTI's data procedures and methodology, visit www.asti.cgiar.org/methodology; for more information on agricultural R&D in Nepal, visit www.asti.cgiar.org/nepal.

ACRONYMS USED IN THIS FACTSHEET

AgGDP	Agricultural gross domestic product
DFRS	Department of Forestry Research and Survey
FORWARD	Forum for Rural Welfare and Agricultural Reform for Development
FTE(s)	Full-time equivalent (researchers)
GDP	Gross domestic product
IAAS	Institute of Agriculture and Animal Science
IOF	Institute of Forestry
LI-BIRD	Local Initiatives for Biodiversity, Research, and Development
NARC	Nepal Agricultural Research Council
NAST	Nepal Academy of Science and Technology
NGOs	Nongovernment organizations
PPP	Purchasing power parity (exchange rates)
R&D	Research and development

ABOUT ASTI, IFPRI, AND NARC

Working through collaborative alliances with numerous national and regional R&D agencies and international institutions, **Agricultural Science and Technology Indicators (ASTI)** is a comprehensive and trusted source of information on agricultural R&D systems across the developing world. ASTI is led by the **International Food Policy Research Institute (IFPRI)**, which—as a CGIAR member—provides evidence-based policy solutions to sustainably end hunger and malnutrition and reduce poverty. The **Nepal Agricultural Research Council (NARC)** is Nepal's principal agricultural research agency. It operates under the Ministry of Agricultural Development and carries out research related to crops, livestock, aquaculture, natural resources, and socioeconomics.

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