Food and Agriculture Organization of the United Nations

15 YEARS IN AFGHANISTAN

A SPECIAL REPORT: 2003-2018

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REPRESENTATION OFFICE IN AFGHANISTAN
THE FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
KABUL, 2018

ISBN 978-92-5-130936-0

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Citation:
FAO. 2018. 15 Years in Afghanistan a special report: 2003-2018. Rome. 126pp. http://www.fao.org/3/CA14336EN/ca1433en.pdf

Cover Photo: Farmers and irrigation water users in northern Afghanistan. ©FAO/Jenna Jadin

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FOREWORD

Since it emerged from over two decades of war 17 years ago, Afghanistan has made steady progress across almost all economic and social sectors: girls are going to school again, all ethnic groups are being given equal rights, and power grids are up and running in much of the country. Unfortunately, many of these development gains have also been quickly lost due to continuing civil unrest, which is destroying infrastructure and preventing both national and international development staff from doing much-needed work in many parts of the country.

This oscillating pattern of development is supported by Afghanistan's Human Development Index score: it has steadily grown since 2002 but Afghanistan's overall ranking has gone down. This means that while Afghanistan is improving, other least-developed countries are improving faster. For a country that used to be the top in the region in many sectors before war broke out in 1979, this trend is dismaying. And for those of us who work in and care deeply about Afghanistan, this pattern is something we urgently want to change.

Agriculture is, and can continue to be, the foundation for that change. Agriculture and livestock have always been the backbone of Afghanistan's livelihoods and economy, and that shows in the diversity of excellent products produced here, from healthy yogurts, to delectable grapes, to world-renowned rugs. It also shows in the faces of the people of Afghanistan, who beam with pride when they talk about the abundant produce, skillful artistry and agricultural landscapes of their beautiful country. And because agriculture is so key to the success of this country, FAO, with generous support from the international community, has allocated resources accordingly and supports over 250 staff, mostly national, currently hard at work.

Rajendra Aryal
FAO Representative in Afghanistan

Afghanistan became a member of FAO in 1949, and since that time, FAO has been working in Afghanistan nearly continuously. The projects FAO has implemented, as this report will tell you, have always evolved in response to government priorities and national needs. They have ranged from months-long projects to help farmers avoid acute food insecurity, to decade-long projects to build a dairy private sector. The projects have cut across all agricultural sectors, but common themes uniting them all have been full community involvement, women's empowerment, and responding first to those people most in need. As the country's population grows, and climate change progresses, we know FAO programming will continue to respond to Afghanistan's changing needs. For one, a move towards improved value chains, private sector development, community resilience, and technology transfer is already in progress.

This report reflects the highlights of the past 15 years of FAO programming in country. With over 400 projects implemented in that time - on normative, development and resilience building - this report could not possibly detail them all. However, the FAO Afghanistan team came together to recommend some of the most impactful projects, some of the most long-term, and some of the most technically or socially innovative that we have implemented over the past decade-and-a-half. And, like all things in life, not every effort is a success, but every effort is a growing experience, for both FAO and for Afghanistan.

I am so impressed by the work FAO Afghanistan has done in the country, and I am even more impressed with the talented local and international staff, including those at FAO regional offices and headquarters, who have worked hard over the years to ensure our projects improve economies and peace in the communities they touch, and also positively impact government staff, local entrepreneurs, civil society, academia and the private sector. I hope that this report will make you impressed by both FAO and the remarkable agricultural talent of Afghanistan too.

ACKNOWLEDGMENTS

While countless people have provided advice, technical information, logistical support and creative ideas that led to the completion of this report, and are too many to name personally, the author would especially like to acknowledge the contribution of a special few:

First, a great deal of credit needs to go to FAO senior staff Mr. Moeen Ud Din Siraj for conceptualizing this report, and to both him and former FAO Representative Mr. Tomio Shichiri for providing the author the time, freedom and financial support to put this work together.

Next, this report would also not be possible without the elegant layout refinement and advanced training on the use of graphic design tools given to the author of this report by Ms. Elena Shubina of iMMAP. She donated her time freely to support this project, a testament to the power of cooperation among the UN and it's development partners.

Very able field and translational support was provided by FAO Afghanistan staff: Dr. Mohammad Khalid Besmil Amini, Mr. Zia Aria, Mr. Bashir Mawlawizada, Ms. Nazifa Natique, and Mr. Abdul Shadan.

Appreciation also goes to FAO Afghanistan staff who took the time to read through chapters of the report, catch factual errors, provide creative input, and improve the overall reporting of results. These include: Ms. Nasima Ali, Mr. Hameedullah Ahmadzai, Ms. Mehnaz Ajmal, Mr. Mohammad Aqa, Mr. Zia Aria, Mr. Fabio Fukuda, Ms. Frestha Ghani, Mr. Som Khanal, Dr. Aminuddin Naseri, Ms. Shogofa Sarabi, Mr. Sayed Sharif, Ms. Saeeda Sharifi, Mr. Suman Sijapati, Mr. Momir Vranes, and Mr. Khalil Yousufzai.

And finally, thanks to the wonderfully generous and kind people of Afghanistan who took the time to be photographed and interviewed by FAO field teams and answer questions about FAO's work, it's impact on their lives, and their hopes for the future of their families and their country. Such insight was valuable not only for this report, but for the future of all FAO programming.

ABBREVIATIONS

AFN	Afghani Currency
AfSIS	Afghanistan Soil Information System
ANSOR	The Afghanistan National Seed Organization
ARIA	Agriculture Research Institute of Afghanistan
CBNRM	Community-Based Natural Resource Management
CDC	Community Development Councils
CIG	Common Interest Group
CPF	Country Programming Framework
CSO	Central Statistics Organization
EIRP	Emergency Irrigation Rehabilitation Project
ESC	Environmental Sub-Committee
EX-ACT	EX-Anti Carbon Balance Tool
FAAHM	Food, Agriculture and Animal Husbandry
FAO	The Food and Agriculture Organization of the United Nations
FAOAF	FAO Afghanistan
FBO	Farmer Based Organization
FFS	Farmer Field School
FIRST	Food and Nutrition Security Impact, Resilience, Sustainability and Transformation
FMD	Foot-and-Mouth Disease
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Global Information Systems
GoIRA	Government of the Islamic Republic of Afghanistan
HFLS	Household Food and Livelihood Security
HPAI	Highly Pathogenic Avian Influenza
IA	Irrigation Associations
IASC	Integrated Agricultural Service Centers
IDP	Internally-displaced Person
IDS	Integrated Dairy Scheme
IPC	Integrated Food Security Phase Classification
IPM	Integrated Pest Management
IRDP	Irrigation Restoration and Development Project
ISE	Improved Seed Enterprises
MAIL	Ministry of Agriculture, Irrigation and Livestock
MEW	Ministry of Energy and Water
MRRD	Ministry of Rural Rehabilitation and Development
NCADPP	National Comprehensive Agriculture Development Priority Program
NEPA	National Environmental Protection Agency
NGO	Non-governmental Organization
NSB	National Seed Board
PAIL	Provincial Ministry of Agriculture, Irrigation and Livestock
PEAC	Provincial Environment Advisory Councils
PMS	Peace Medical Service
PPP	Public-Private Partnerships
PPR	Peste de Petits Ruminants
SAARC	South Asian Association for Regional Cooperation
SAISEM	Strengthened Approach for the Integration of Sustainable Environmental Management
SALEH	Sustainable Agricultural Livelihoods in the Eastern Hazarajat
SARD	Support Agriculture and Rural Development
SDGs	Sustainable Development Goals
SO	Strategic Objectives
SP	Strategic Priority
TAD	Transboundary Animal Disease
ToT	Training-of-Trainer
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
USD	United States Dollar
VFU	Veterinary Field Unit
WEP	Women's Empowerment Programme
WFP	World Food Programme

EXECUTIVE SUMMARY

Agriculture is unarguably the backbone of Afghanistan. It directly or indirectly employs the bulk of the population, it drives GDP growth in years with favorable weather, and it provides the only source of livelihood for the majority of the estimated 19.3 million people living below the poverty line. For these reasons, FAO Afghanistan is one of the biggest FAO country offices in the world, and it has been based in and operating in Afghanistan continually since post-war reconstruction began in 2002. It has been doing work in the country since at least 1952, often operating through brave national staff during years of unrest that barred international staff from the country.

In the past 15 years, FAO has operated over 400 large and small projects in country, ranging from months-long projects on backyard beekeeping, to decade-long projects on restoring irrigation infrastructure. The projects have always taken care to follow priorities defined by the Afghan Government itself, beginning with those priorities outlined in the 2006 Master Plan, the 2009 National Agriculture Development Framework, and now the National Comprehensive Agriculture Development Priority Program (NCADPP) today. This report has been organized to show how FAO's work aligns closely with the current NCADPP, however, it always has been and always will be responsive to Afghanistan's changing needs.

One of the longest-running FAO projects in Afghanistan has been the combined **irrigation systems** restoration and development project. Beginning in 2004 and continuing today, these projects have supported both large and small traditional irrigation schemes through MEW. Primary and secondary canals, culverts, canal gates, holding ponds and small hydroelectric works that provide power for local communities have all been built, and feasibility studies for small and medium-sized dams have been completed. At the center of all of these projects were the communities they impacted. Before irrigation works are designed, local communities are consulted in order to understand their needs, local workers are paid for time spent constructing irrigation structures, and both water users and mirabs are trained in the operation and maintenance of these structures, as well as efficient water use.

These projects were also instrumental in setting up the beginnings of a modern hydromet network in country. Such a network is essential for collecting accurate ground-based climate and water flow information so that stakeholders can make data-based decisions, as well as understand when slow-onset climactic disasters might be occurring. This hydromet network is now in need of repair due to theft and degradation in parts of the country where security prevents maintenance. But, many stations still exist and with a bit of work and improved security, Afghanistan could again collect the data on precipitation, run-off and water flow it needs to make its' future more water secure. Groundwater monitoring efforts in major cities are also underway, complementing the hydromet network.

A number of smaller irrigation projects implemented through both MAIL and MEW are also trying to combat devastating local flooding, stem soil erosion and improve the efficiency of on-farm water management. These projects have focused on areas where water control structures were built with primitive local materials, where severe soil erosion caused poor harvests, or where rice growing was prohibited by poor water control. These projects also trained GoIRA staff and community members, they developed small-scale livelihood opportunities that could make use of the well-controlled water supplies, and they considered social needs, like washing platforms, and built them into infrastructure as appropriate.

Improved wheat and cereal production has also always been a major focus of FAO's work in Afghanistan. This began with a large number of emergency wheat response projects in the early years of reconstruction. These projects are estimated to have donated close to 40 000 MT of quality wheat seeds, tools and training on wheat growing practices to smallholder farmers in need of help during droughts and other natural disasters. However, recognizing that emergency response is not sustainable, nor does it give people the self-sufficiency they desire, FAO has invested significantly into improving the wheat seed industry within the country.

Afghanistan was once nearly self-sufficient in wheat, but after over 30 years of war, its wheat and seed industry were completely destroyed and farmers depended upon imports of both wheat and wheat

seed. Recognizing that Afghanistan needed it's own wheat input industry, FAO supported a series of seed development projects that succeeded in setting up what is a now-thriving national seed private sector.

The Seed Projects were primarily focused on researching, growing, selecting and marketing high-quality seed, while also doing policy work, such as helping MAIL develop the current National Seed Law and Seed Policy. The main goal of the project was to help the Agriculture Research Institute of Afghanistan in MAIL become the leading breeder seed production center for the country. Staff were trained both in-country and abroad to do test plots, trials, and strictly manage the production of quality seed, which was then sent to the now semi-privatized Improved Seed Enterprises who made the next round of seeds. These were finally sold to private seed companies, many of which FAO helped establish, so they could produce certified seed and sell them to farmers nationwide.

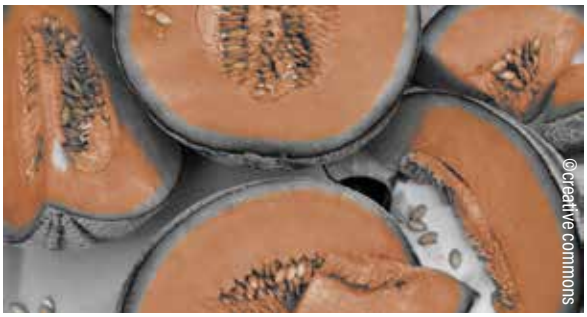
While a bit costlier than traditional seeds, farmers quickly realized investment into better seeds was more than paid off by the huge increases in wheat yield. And because a national wheat seed industry now exists, the country is one step closer to self-sustainability in this essential crop.

Wheat, while the nations' staple crop, is not the most profitable nor most nutritious. That's why FAO has also supported an increasing number of projects aimed at developing **high value horticultural crops** and the value chain that brings them to market. Most of these projects were subcomponents of irrigation or small-scale livelihood projects, but a handful of projects have specifically focused on improving these crops and their value chains.

One such project introduced the concepts and techniques of Integrated Pest Management to farmers of melons, potatoes, pomegranates and select other crops. These techniques were simple, cost-effective, and resulted in less money spent on farming inputs for growers, pesticide-free products for consumers and an improved farming environment. Farmers were taught to grow potatoes in small ridges that discouraged weed growth, bag melons with simple cloth bags to protect them from melon flies, and use other conservation agriculture techniques to improve crop yield while rehabilitating the land. As an example of the success of this project, there were no reported outbreaks of melon fly in the country during the project, and melon yields went up by 77 percent.

One ongoing high-value horticultural crops project

(known as SARD) is aiming to elevate subsistence farmers into small-scale producers. This project began with a household livelihoods survey that reached over 150 000 people, and was then uploaded into publicly



accessible MAIL computer systems, allowing project designers to understand communities and create responsive projects. An FAO innovation, Common Interest Groups (CIGs), were formed so farmers and producers could jointly solve production and marketing challenges. Many groups have opened revolving funds for reinvesting their profits.

Farmers in this project and many others are trained using a successful Farmer Field School model, where local farmers are taught to be trainers themselves, ensuring the technical advice is sustained in communities beyond project end. Two years into SARD, over 1200 farmers, entrepreneurs and government staff have been trained on everything from beekeeping to food safety to fig cultivation. Decent work has been created for hundreds, and will be sustainable if the groups continue to reinvest their profits into smart farm technology.

The **livestock sector** is a giant in Afghanistan: it accounts for 15 percent of the agricultural GDP and supports ~1.1 million jobs. Fittingly, livestock support has been another major focus of FAO. The biggest success in this sector has been the Integrated Dairy Schemes projects, which have succeeded in creating a flourishing private-sector dairy industry.

These projects helped dairy farmers organize into village-level cooperatives linked to district-level milk collection centers that collect milk daily, and bring to provincial milk processing centers. The centers process the milk into pasteurized milk, butter, yogurt and cream, and make fodder into nutrient-rich animal feed. As a result of the projects, dairy farmer incomes have increased 338 percent, and Afghanistan is getting closer to total import substitution of dairy products.

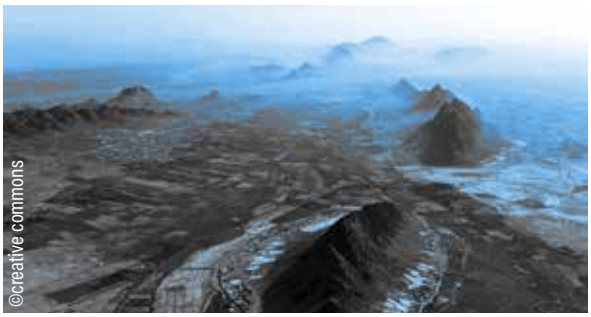
Poultry provides a way out of poverty for the poorest: chickens are inexpensive to raise, they provide protein, and excess eggs can be sold to generate income. FAO has supported three large and many small poultry projects. Most were begun by establishing a local poultry group who was trained to buy quality inputs, treat disease, and market eggs. Combined, the major poultry projects taught 70 000 women about poultry farming, distributed nearly 800 000 chicks and vaccinated nearly 2 000 000 birds for avian influenza. As a result of this, a semi-commercial poultry industry has emerged in parts of north and central Afghanistan.

Animal disease is another major issue for livestock. Afghanistan has several diseases which are rampant, resulting in unnecessary livestock death. The ongoing Transboundary Animal Diseases project is following world-recognized protocols to bring these diseases under control. It is doing this through helping veterinarians better diagnose and treat illness, teaching

pastoralists to recognize disease, and providing free high-quality vaccinations at animal markets and with field mobile veterinary field units. Only two years in, 400 000 cattle and millions of sheep and goats have already been vaccinated against two diseases. By project end, the goal is to have reached every ruminant in the country.

The NCADPP outlines **climate-sensitive natural resource management** as its' fifth priority area. While past FAO projects typically focused on sub-sectors (water, seeds, livestock, gardening, etc) and did not take a holistic climate change-driven approach, a growing number of ongoing and planned projects are aimed at specifically addressing climate change and natural resources. This number will only grow as more donors are directing funding at this topic.

A joint FAO-UNEP-UNDP project known as SAISEM, and a great example of the One UN Approach, was aimed exclusively at improving natural resource management. It had both policy and practical components that aimed to restore Afghanistan's natural resources. On the policy side, the project



helped NEPA develop National Environmental Mainstreaming Guidelines, and the countries first-ever National Forestry Management Plan. On the practical side, the project helped establish environmental subcommittees in districts to raise local awareness about environmental issues, taught communities the principles of community-based natural resource management, donated firewood saplings to farmers to discourage the cutting of forests, and rehabilitated over 150 hectares of rangeland in three provinces that had severe problems with land degradation.

As Afghanistan grows it's economy, it will become a bigger greenhouse gas emitter. One ongoing project is tackling both climate change mitigation and adaptation through government training, high-technology approaches, and low-cost community solutions. This project has been setting up forest management associations in Nangarhar and Parwan, teaching communities about natural resource management, training government staff to better support local initiatives, constructing biogas digesters, and selling low-cost fuel-efficient heaters and cookstoves, so that communities cut down fewer trees and protect their forests. By project end, it will have distributed over 5000 fuel-efficient heaters and cookers, and trained thousands of people on natural resource topics, ideally saving hundreds of hectares of forests in just two provinces.

Nutrition and food security are the foundational principles behind every project FAO has ever done in country; however, FAO has also implemented projects specifically aimed at building community resiliency around food and nutrition. The first one of these focused on the Hazarajat, an impoverished area of Bamyan province largely populated by the Shia Hazara minority. The Hazarajat is challenging to farm due to its' high altitude. However, it has always been known for producing the best potatoes in the country. FAO worked with communities in this region to make small but sustainable improvements in wheat, potato and pulse production, promote better animal husbandry, build greenhouses, establish orchards, and empower locals to make their own data-driven decisions about land use. Over 12 000 farming families benefited from the project, including over 3000 female farmers who were raising poultry in backyard farms by project end.

Another set of projects , known as the Household Food and Livelihoods (HFLS) projects, specifically address food security and nutrition, and have been ongoing for the past 8 years. These projects work with both MAIL, MRRD, the Ministry of Education, and other UN organizations and NGOs. This joint effort works to alleviate extreme poverty by providing small-scale

farmers with improved and diversified farming systems, training the farmers to become self-reliant, and building the national extension services so that they will be more responsive to farmer needs.

Notably, the projects have been successful in setting up CIGs and revolving funds to support topics ranging from potato cultivation to poultry-farming to school lunches. They always have begun with in-depth surveys, so that both the communities and GoIRA have a strong foundation of data on existing livelihoods to work from. While the HFLS projects have only worked in four provinces, the GoIRA has is very interested in expanding them nationwide. This desire was largely driven by the fact that it's been very financially efficient: in just one growing season, the CIG revolving funds recovered 80 percent of the costs of the inputs.

The NCADPP calls out **institutional resilience building** as the final key priority for agriculture sector development. With the exception of some of FAO's emergency response efforts, every project in country has always had a substantial government training and strengthening component. Often that's happened through conducting training programmes, sponsoring MS degrees, or developing curriculum and guidelines to support the applicable agricultural sectors. Other times it's been through building government facilities or supplying laboratories with the reagents and supplies they need to support the most modern agriculture practices. A handful of projects have also focused exclusively on institutional capacity and resilience.

The longest running such project worked with agricultural information management and agricultural statistics staff within MAIL and the CSO. The FAO staff helped MAIL and CSO staff better collect, process and analyze data. As a result of this work, Afghanistan began to and continues to produce bi-yearly agricultural prospects reports which are regularly used by national

and international NGOs and donors. These reports are used by FAO globally to help producers, traders and national governments understand farm commodity prices, availability and production rates so that stakeholders can adjust to market changes to improve their profits and meet market demands.

While these reports are extremely useful, by far the biggest achievement of this project was the creation of the 2016 Land Cover Atlas of Afghanistan. Land cover data for Afghanistan had not been updated since 1993, and the country has obviously went through enormous changes since then. This Atlas, jointly created by FAO, MEW and MAIL not only contains updated, high-resolution land cover data for the entire country, supporting better data-based decision-making, but the process of making it trained hundreds of government staff in better data collection and visualization techniques. If these staff can train new staff in these skills, MEW and MAIL will have a long term-ability to collect and process geographic and visual data, supporting better decision-making long into the future.

Finally, though FAO has always responded to government priorities, it's work goes **beyond the primary focal areas laid out in the NCADPP or any previous agricultural sector development plans**. Private sector development, improving research and extension, and supporting farmer organizations are embedded within nearly every FAO project. But, FAO has also done stand-alone work that addresses UN priorities or Afghan needs while still crosscutting the NCADPP.

One of these topics is women's empowerment. All FAO projects begin with community consultations in order to understand the special needs of women given their limited mobility and social roles. Notably the Integrated Dairy projects played a major role in building the capacity of women to care for their animals and safely process milk, empowering many women to earn money from their animals for the first time ever. Some projects have also directly focused on women's standing in the

agricultural sector. One of these such projects helped GoIRA formulate the National Strategy on Women in Agriculture Development, helped MAIL develop curriculum for rural women, and supported the celebration of International Women's Day for the first time ever in Afghanistan. Other projects, such as the ongoing HFLS and closed SALEH projects had specific components focused on teaching women to read, grow mushrooms, or start backyard poultry farms.

Other cross-cutting work supported by FAO is work on the Sustainable Development Goals. FAO has particularly been helping Afghanistan meet its' own stated goals related to SDG 2: Zero Hunger. For example, the FIRST program has been preparing roadmaps for reaching Zero Hunger goals, and helping MAIL raise awareness this of this work both in Kabul and across the country. FAO also helps MAIL mainstream the SDGs into it's projects and helps MAIL staff monitor and reports on SDG progress.

Emergency response is also cross-cutting. And, it's always been a major part of FAO's work in Afghanistan. It likely will continue to be a large part of FAO's work into the medium-term future, but hopefully, as the country rebuilds, work will be proactive, rather than reactive. Regardless, through FAO's quick and well-targeted emergency response and resilience work, thousands of tons of certified wheat seed and concentrated animal feed have been donated, vaccines have been delivered to millions of animals, water infrastructure has been rebuilt, insect infestations have been managed, and vegetable seed kits, fertilizer, farming tools, and training have been given to those communities most in need when a disaster hits.

Finally, just like science doesn't stop at international borders, neither does FAO. Several projects over the past 15 years have originated from FAO Rome or Bangkok, but have addressed Afghan needs as they relate to larger regional issues. These include projects on soaring food prices, food security monitoring, and avian influenza. FAO Afghanistan is also leading regionally through its ongoing animal disease project. This project brings together animal science experts to solve animal health both within their own countries, and across regional trade and migration borders. These experts are able to work freely together in ways that official diplomats often cannot. This work therefore not only builds Afghanistan's food security and resilience, but also regional trust and cooperation.

ABOUT FAO

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Achieving food security – making sure people have regular access to sufficient high-quality food to lead healthy, active lives - is at the heart of the Food and Agriculture Organization of the United Nations (FAO) efforts worldwide.

FAO has 194 Member Nations, two associate members and one organizational member, the European Union. FAO staff are technical experts who support improved governance, the development and adaptation of tools and guidelines for agriculture, and provide technical expertise to FAO offices and national governments worldwide in over 130 countries.

FAO's three main goals are to eradicate hunger, food insecurity and malnutrition; eliminate poverty and forward economic and social progress for all; and, sustainably manage and use natural resources, for the benefit of present and future generations.

Ending hunger and poverty is a complex and difficult challenge, however, in an increasingly interdependent and highly-populated world, addressing this challenge is more urgent than ever before. Rising food demands, persistent food insecurity, malnutrition, rural poverty, economic instability, population growth and climate change, are just some of the individual challenges that need to be addressed to ensure no one goes hungry. Because of the depth and breadth of these challenges, FAO created a new strategic framework in 2013, which is defined by five Strategic Objectives (SO).

FIVE STRATEGIC OBJECTIVES

SO1	SO2	SO3	SO4	SO5
Help eliminate hunger, food insecurity and malnutrition	Make agriculture, forestry and fisheries more productive and sustainable	Reduce rural poverty	Enable inclusive and efficient agricultural and food systems	Increase the resilience of livelihoods from disasters

FOOD AND AGRICULTURE IN AFGHANISTAN

About 19.3 million Afghans live in poverty, a number which has grown 21 percent in ten years[1]. Nearly 82 percent of those poor live in rural areas[2] and at least 54 percent of rural households farm or tend livestock[3]. The agri-industry employs 44 percent of the national workforce,[4] 61 percent of all households derive some income from agriculture[5], and 90 percent of manufacturing is in the sector[6]. Agriculture accounts for about 25 percent of the national GDP[7], and, it leads GDP growth in years with sufficient precipitation. If agricultural production can be improved, particularly in dry years, agriculture could consistently lead national economic growth.

As of 2016, agricultural products were almost 60 percent of total licit exports[8]. Major exports are grapes, vegetable saps, nuts, and tropical fruits. Afghanistan was once a world leader in many agricultural exports[9] - but agricultural production decreased by 3.5 percent a year between 1978 and 2004 and livestock herds also decreased radically. The agriculture sector still needs to make up for these losses suffered over the long period of civil conflict. Today growth in the sector depends on cereal production, which is over 80 percent of the agricultural economy[10]. This needs to be diversified if Afghan agriculture is to return to it's former economic prominence.

Agriculture value has grown nearly 3 percent each year since 2003, but increasing numbers of people have entered the sector, meaning there is an overall per farmer decline[11]. This is due largely to decreasing water availability and depleted natural resources, being exacerbated by climate change, and leading to pervasive food insecurity. About 45 percent of the country is food insecure, and food insecurity is highly tied to low educational attainment[12]. Rural households are more food insecure than urban ones[13], but urban food insecurity is also rapidly increasing as returnees and environmental refugees surge into cities and create large food-poor slums.

Food insecurity perpetuates high maternal, infant, and child mortality rates. Women have disproportionately lower access to adequate food, and malnutrition is more likely to occur in women who are illiterate, unmarried, or have not had access to at least primary education. Nearly 9 percent of the women of reproductive age are severely malnourished, 5 percent of female-headed households are severely malnourished[14], 41 percent of children under the age of five are stunted, and 25 percent of them are underweight[15], all leading to limited mental development. While these numbers have improved in the past ten years, there is still a long way to go.

Despite these statistics, Afghanistan has also shown significant progress in recent years. After decades of war, with over a million Afghans dead, an exodus of refugees, transport infrastructure in disarray, agricultural land destroyed, livestock populations decimated and an absence of public services, Afghanistan has many major challenges to overcome. However, with the support of FAO, other donors, and an increasingly capable and dedicated national agricultural workforce, these challenges will not be insurmountable; there is a real hope that climate-smart and sustainable agriculture can play a major role in bolstering Afghanistan's prosperity and peace.

15 YEARS OF FAO STRATEGY

During its' first, early days in Afghanistan in the 1950's FAO's work focused on rural capacity building and acute disaster relief. It continued that way for years, even operating out-of-country from Pakistan during the 1990's, and returning in 2001 after the ousting of the Taliban. As the country was in dire need of rapid rebuilding, FAO efforts on disaster response continued, but also turned towards aiding in reconstruction.

In 2005, after a few years of stabilization and a long-deserved period of relative peace and economic growth in Afghanistan, GoIRA set out to outline strategic objectives for the country's development. Agriculture was a sector that received considerable attention, due to its' prominence in daily life as well as its potential to stimulate economic growth and security. Afghan agricultural exports were once some of the best in the world, and with improved production, processing and marketing, they could return to their former glory.

To achieve these ends, GoIRA wrote a series of plans that clarified development objectives; the first such plan was known simply as the Master Plan[16]. The Master Plan was formalized in 2006 and defined priorities for agricultural development and nationwide stability: horticulture improvements, livestock growth, and increased cereal production. The Plan also identified priorities in natural resource management, research, extension, financial systems, gender equity and institutional capacity.

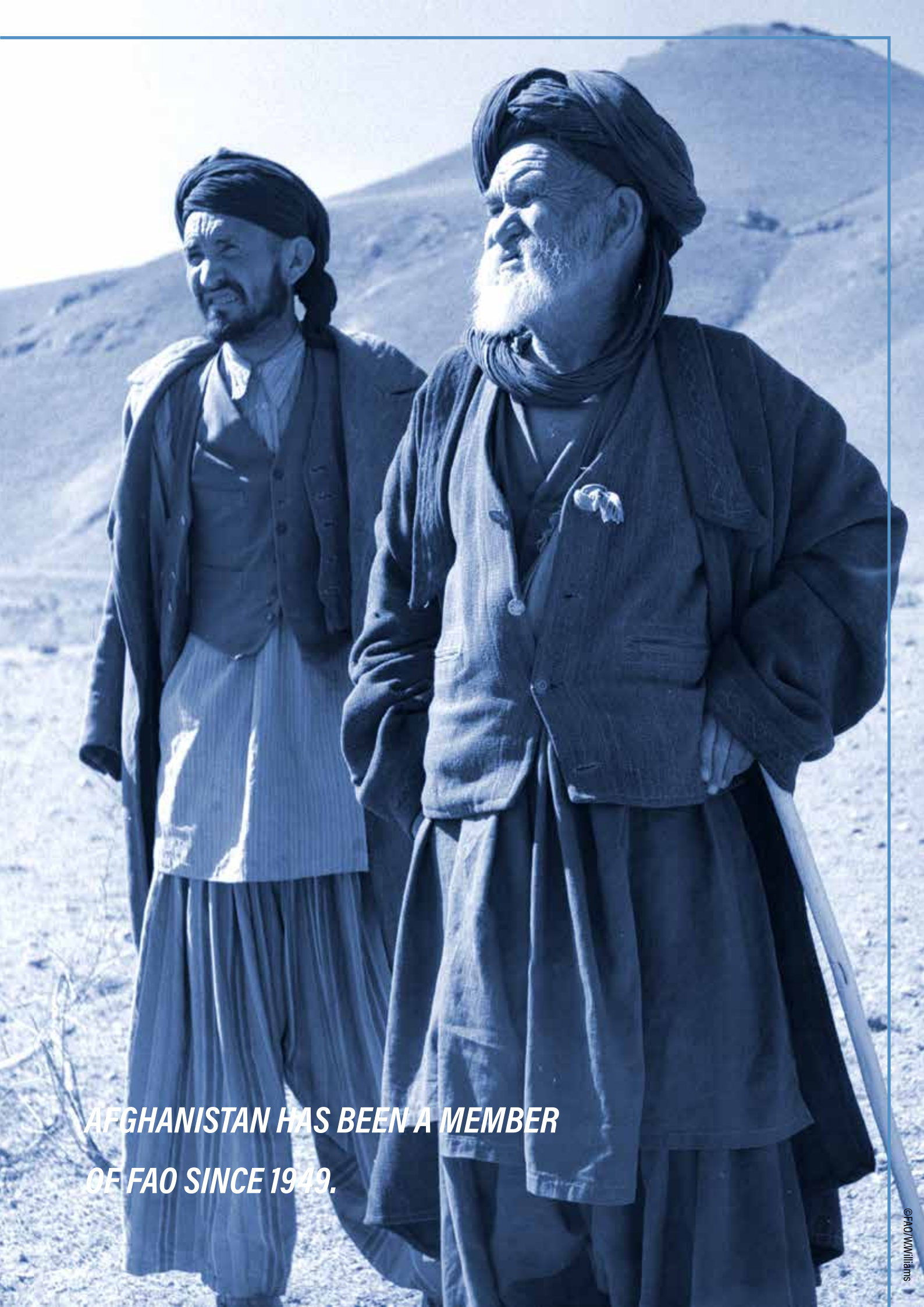
To realize the Plan, the former Ministry of Agriculture used it to prioritize its' own strategic actions. The Ministry identified seven major program themes that it would implement over the ensuing five years. These included Food Security, Livestock, Natural Resource Management, and Irrigation, among others. FAO stepped up to help by ensuring its support for the (former) Ministry of Agriculture and the Ministry of Energy and Water (MEW) lined up with these seven strategic priorities, while still responding to humanitarian disasters.

While much of FAO's early work was successful in achieving its' short-term goals, FAO Afghanistan (FAOAF) knew that it needed its' own coordinated strategy that was more proactive than reactive. Only with such a future-oriented development strategy would Afghanistan be able to achieve sustainable rural development, food security and economic growth, which would be implemented by the Afghan people themselves. Therefore, in 2012 FAO formalized its first Country Programming Framework (CPF) for Afghanistan[17].

The CPF was designed to help the agriculture industry through the "transition" phase marked by the gradual withdrawal of international security troops and their provincial reconstruction teams. This transition required a transfer of ownership of the development process to Afghan leaders. National institutions took on increasing roles in policy formulation, implementation and monitoring. FAO designed the CPF to be a cohesive approach that addressed the needs of this rapidly-changing environment, and was aligned with the UN Development Assistance Framework and the growth agenda outlined by the Kabul Process that emerged from the 2010 International Conference on Afghanistan.

The CPF laid out six focal areas for FAO which were directly aligned to the existing national agricultural priorities, as well as with four National Priority Programmes adopted by an inter-ministerial Agriculture and Rural Development Cluster. The CPF foci also directly reflected the development agenda GoIRA was pursuing in the transition phase. The CPF was also consistent with the objectives of other national strategic documents such as the Afghanistan National Development Strategy (2008-2013), the Agriculture and Rural Development Sector Strategy, and the National Agriculture Development Framework of 2009. Rural development took precedence, and all national development would support this goal.

In 2014, a new government took power, led by H.E. President Ashraf Ghani, and this new government had new goals. To clarify these, GoIRA developed a five-year (2017-2022) Afghan National Peace and Development Framework, which currently serves as a guideline for all Ministries to develop their policies and programs. For the agricultural sector, the administration placed emphasis on raising agricultural productivity through Public-Private Partnerships (PPPs), improving the irrigation network, and building value chains for all agricultural products. To make sure this new vision was implemented reliably, the newly-reorganized Ministry of Agriculture, Irrigation and Livestock (MAIL) developed a new National Comprehensive Agriculture Development Priority Program (NCADPP) for 2016-2020[18]. The NCADPP was created using lessons learned from many previous plans and strategies, and is the current framework for agricultural development.



AFGHANISTAN HAS BEEN A MEMBER OF FAO SINCE 1949.

FAO WORK HAS ALWAYS BEEN DRIVEN BY GoIRA PRIORITIES.

This NCADPP begins by noting the paradox in Afghanistan's agricultural sector: the rural population has doubled in under a decade, and because of this, the amount of arable land is shrinking almost as quickly. Youth are losing interest in farming and moving to cities, while the overall population growth rate is well beyond replacement rate; this means that feeding all of Afghanistan's citizens is going to be increasingly challenging as the 21st century marches on. The NCADPP goes on to define the seven strategic priorities (SP)s that are now the focus of the agriculture and food sector. These are: 1) Improving Irrigation Systems; 2) Increased Wheat and Cereal Production; 3) Development of Industrial and High-Value Horticulture Crops and Vegetables; 4) Livestock Production; 5) Climate-Sensitive Natural Resource Management; 6) Food and Nutrition Security and Resilience Building; and, 7) Institutional Reform and Capacity Building.

The NCADPP also specifies that the role of MAIL is to plan, regulate, and enforce this new vision, rather than act as a direct service provider. Therefore, MAIL announced that from now on, agriculture will take a farmer-centric, rather than an institution-centric, approach. The aim is to create an atmosphere in which farmers to are able to create surpluses in their products, increase on- and off-farm employment and generate income through increased exports. MAIL has also recognized a need to decentralize agricultural governance and transfer much of the knowledge and decision-making power to the Provincial Ministries of Agriculture, Irrigation and Livestock (PAILs). These PAILs and their extension specialists will focus on training and capacity in agricultural workers. Such an approach will help ensure that new agricultural practices and policies are sustainable.

FAO has always shared the Government's vision for agricultural development, which is why its' current and past projects have always been designed to align with priorities set out GoIRA. To line up with GoIRA's new goals, FAOAF also produced a new CPF for 2017-2021. The CPF was prepared following consultations with government Ministries, donors and other stakeholders, as well as extensive reviews of published materials on agriculture in Afghanistan. It also is tied to the Afghanistan National Food Security and Nutrition Agenda and the Citizen Charter Programme. Under the new CPF, FAO will support Ministries and other stakeholders in four areas of FAO expertise: 1) Improved capacity for policy planning, land reform, decentralization, and natural resource management; 2) Expansion of irrigation and water management; 3) Development of agricultural commercialization, value chains, and jobs; 4) Support for vulnerable farmers to improve their food security, climate resiliency, and response to disasters.

Support for FAO activities has come from many multilateral and bilateral donors, including the governments of Belgium, Germany, Italy, Japan, Luxembourg, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States, as well as the European Commission, and the UN Central Emergency Response Fund. FAO work has also been supported through funds from GoIRA received via the World Bank and the International Fund for Agriculture Development, among others. And while donor funding will reduce over time, if Afghanistan can continue to stabilize, reduce corruption and show development progress, new funds will also emerge. Right now, some new funding opportunities for Afghanistan are coming from the Green Climate Fund, the Global Environment Facility, and FAO's Technical Cooperation Programme. Much of this funding is for climate change adaptation, an increasingly widespread theme in development.

This report was written to showcase the impressive volume of work that the FAO, in close cooperation with GoIRA, has done in the past 15 years. Most projects have made substantial differences in the lives of many Afghans, and field interviews done for this report found that the majority of those positive changes have been sustained despite pervasive insecurity. Institutions FAO helped set up continue to function and grow, government staff that FAO trained continue to lead in their fields, and farm producers that FAO coached are still practicing their crafts. The credit for such success goes not only to FAOAF and its' donors for careful planning, but also to GoIRA and the enduring Afghan people, who know that the torches of sustainable agriculture, peace, and prosperity are held by them.

The following chapters are organized in line with the priorities set out in the current agricultural development plan, the NCADPP, in order to highlight how FAO continues to address Afghanistan's priorities. They showcase just a few of the hundreds of projects FAOAF has completed. They underscore the progress the FAOAF has made over the past 15 years, and continues to make today, to achieve GoIRA priorities and bring food security, a healthier environment, and more wealth to all people of Afghanistan.

1 IMPROVED IRRIGATION SYSTEMS

This canal being used by female herders is one of many canals built by FAO.

Investment in irrigation may be the best way for Afghanistan to encourage economic growth, increase employment and enhance food security - especially in rural areas. The nearly 75 percent[19] of the population that lives in rural areas are dependent on agriculture systems for at least part of their income. These systems are in turn dependent upon water supplies.

In a semi-arid, mountainous country like Afghanistan with depleted natural land cover due to years of overuse, agriculture is challenging even under the best of conditions. Irrigation systems that were once functional fell into disrepair through years of civil conflict, which has resulted in farmers reducing the area under cultivation, growing less food and earning less money for their families. On top of this already troubled situation, climate change is bringing both increased droughts and floods, meaning that agriculture and livestock production are becoming more volatile every year. A reliable system for capturing, caching and distributing water must be a top priority if Afghanistan wants to not only sustain its' surging population, but stabilize and grow its' economy.

Many communities nationwide experience severe floods most springs. Local land owners express an urgent need for assistance on rebuilding canals[20]. In areas where traditional canals and other irrigation works have been repaired, *mirabs* (water controllers), farmers and other local users have shown an impressive ability to maintain, operate and repair canal systems. However, most of these users are quite cash poor, and do not have the financial means to rent the machinery or purchase the supplies that are needed to repair and extend canal systems farther. Many areas of the country are still in dire need of repair or melioration to their irrigation systems, which will need to come through GoIRA or donor support.

Within the Government, responsibilities for developing irrigation systems are shared between MAIL (small irrigation systems and networks) and MEW (primary irrigation infrastructure and main canals). MAIL's stated goal is to increase irrigated land to 2.7 million ha in the next five years through improvements in these smaller networks, positively impacting 650 000 households[21]; the longer-term goal is to have irrigated land return to prewar levels in ten years.

Achieving this goal will require building new and restoring old irrigation systems, all while taking a farmer-centric approach to water management. Water governance and management will be turned over to Irrigation Associations (IAs), Water Users Associations and Clustered Community Development Councils.

These groups will be trained in water management and given technical support for construction of water structures, and will work with farmers to teach them best water uses practices for their lands and communities.

Under Strategic Priority (SP) 1: Improved Irrigation Systems, MAIL has three subpriorities. First, they aim to increase irrigated land through restoring existing and building new irrigation systems, bringing the total of irrigated land to 3.1 million ha by 2025. These interventions alone should increase food grain production by 2.2 million metric tonnes. However, building irrigation canals will not necessarily lead to sustainable water management. Therefore, the second sub-priority under SP1 is to make sure the newly-built or restored irrigation environment is supported by well-educated users.

MAIL has pledged to improve support for and research on advanced irrigation technologies, as well as enhance farmer educations via extension services. When farmers and water managers make informed decisions about water use for their communities, not only do farmers and pastoralists produce more, but communities avoid conflict, bringing an extra measure of cooperation and stability to places that often badly need it. This second sub-priority under SP1 truly underlines the farmer-centric approach that is a focus of the NCADPP.

The final sub-priority of SP1 is to reform policies, institutions and management to promote investment in irrigation by the private sector. World over, the development community is turning to the private sector to inject innovative thinking and sustained investment into new projects. The private agricultural sector in Afghanistan has already grown significantly in the past 15 years; the irrigation sector needs to capitalize upon this growth by privatizing in a commensurate manner.

Having transparent frameworks and regulations and new Irrigation Associations at the community level, will allow irrigation to be managed locally by community groups and private entities that know the needs of their communities best, empowering locals to grow their water systems and local economies like never before.

FAO has a long history of working on irrigation in Afghanistan, starting with the Soviet withdrawal in 1989, when it began to rehabilitate traditional irrigation systems. Throughout the 1990's the work was focused in the Eastern and Southern provinces, due to funding limitations as well as the challenges posed by the need to be managed out-of-country. But once the Taliban were ousted in 2001, FAO began to invest in or technically-support irrigation across most of the country. The aim of the early projects was to build institutional capacity in small-scale irrigation so that this infrastructure would be able to cope with larger national-level changes.

Since 2003, FAO has made remarkable headway in improving irrigation in Afghanistan. All projects have been designed to help local people extend the reach of irrigated land, and ultimately ensure food security. FAO's contributions have largely fallen into two categories: technical support to MEW through large projects funded by grants to the GoIRA, and through donor grants to FAO that support smaller projects implemented with MAIL. Just a few of the most extensive and impactful projects that have made a remarkable difference on the lives of beneficiaries, and have been sustainable beyond the length of the project, are detailed here.

The first of the large GoIRA-funded projects was the **Emergency Irrigation Rehabilitation Project (EIRP)**[22]. The EIRP was a national project serving all major river basins of Afghanistan and the ministry responsible for implementation was the Ministry of Irrigation, Water Resources and Environment, which has since been reorganized into MEW and MAIL. At the time, EIRP was the only nationwide project that was supporting GoIRA's agenda for irrigation rehabilitation. FAO was the chosen technical advisor for the Ministry because of its long history of successfully managing irrigation projects.

EIRP turned out to be very successful, so the new MEW and FAO wanted another long-term irrigation development project that would continue to rehabilitate irrigation schemes, as well as develop the country's hydromet system. And, perhaps most importantly, this second project would continue to build the capacity of MEW so that they will be able to one day soon prepare and implement their own irrigation and water resource projects without international assistance. The new project that was designed to meet the new needs is called the **Irrigation Restoration and Development Project (IRDP)**[23].

The development objective of both projects was to increase agricultural productivity. Increased productivity improves food security, and reduces vulnerability caused by droughts through fair and reliable dispensation of irrigation water. FAO and MEW are now continuing to rehabilite and improve dilapidated irrigation infrastructure, restore and modernize the hydromet network, develop the capacity of public water institutions, and strengthen community water organizations so that they can sustainably operate and maintain their irrigation systems. This final component is essential, as spending money on new irrigation works only to have them fall into disrepair a few years later benefits no one.

Another major concern is quality control for building irrigation works. Quality control is addressed through various topical trainings for project personnel, quality assurance groups within regional offices who report on the quality of building materials and construction to a quality control officer, and books in the local language that are used by the community builders so that they can understand the necessary specifications.

The projects also prepared feasibility studies for multipurpose irrigation projects, as well as developed monitoring & evaluation plans for all of the subprojects. During IRDP, iInternational consultants were brought in to assess the practicality and effectiveness of both small and large dam projects. After evaluating many options, a full feasibility study was prepared for MEW for the Lower Kokcha Irrigation Hydropower Project. The Project was conceptualized to provide irrigation water for farmers, and electrical power to operate the irrigation schemes, and sell to the local community.

Also in the damming component of IRDP, MEW recruited consultants to select potential dam sites, perform surveys, and draw detailed designs of dams with micro-hydropower installations and related infrastructure. The goal was to provide the government with plans for building small to medium dams and other water resource projects that maximized benefits to local communities while minimizing environmental and social impacts. FAO is currently producing Dam Safety Guidelines for Afghanistan, a document which is destined to be promoted into a legal document once finished.

FAO has also commenced a programme of dam safety reporting and reviews for existing dams; so far nearly half of the dams in Afghanistan have been visited and reported upon. Related dam technical documents and trainings have been produced, such as operation and maintenance manuals, dam break scenario models, and emergency preparedness plans. Finally, dam

All irrigation work was driven by community needs. Canals in need of rehabilitation were assessed, community consultations were held and agreements were signed. The communities received operations and management training before assets were transferred to them. They felt a sense of ownership of the projects that has sustained them.

repairs have commenced on two dams as a result of recommendations from dam safety reviews.

Beyond damming, other studies have been done to support MEW; these included a land acquisition and resettlement policy framework, an environmental and social management framework, and a training framework to improve staff ability to monitor and evaluate these newly-built irrigation schemes.

Another component of the projects was to set up and/or repair a much needed modern hydromet network. Such networks include weather monitoring stations, water level gauges, water and snow stations, water current meters, survey equipment, and laboratories for processing field data, all of which are all connected to a central, national-level monitoring station. Staff then must be trained to use the tools, and guidance manuals need to be prepared for the next generation of managers. Hydromet networks are an essential part of good water management: they collect info for farmers about water diversion, and they help national planners know when droughts or floods are likely to happen, facilitating getting emergency supplies or response plans in place before a community is devastated.

Under another component of the combined projects, human resources were developed, offices were rehabilitated, new equipment was purchased, and technical assistance was delivered to MEW and their Project Coordination Units to help them manage procurement, finances and administration of projects. This was perhaps the most important part of the projects, as such support is what leads to sustainability and precludes the need for international donor support.

To improve government delivery on irrigation matters, trainings were given to provincial irrigation department staff, MEW staff in Kabul, local communities and mirabs, private-sector implementers of sub-projects, university students and lecturers, and FAO national staff. FAO technical assistance included regular backstopping for staff on cost planning, reviewing reports, clearing technical documents, and approving training curricula and capacity-building plans.

After 14 years of implementation, the results from EIRP and IRDP have been impressive. An independent evaluation of EIRP, done by the FAO Rome Evaluation Office, found that the project "is considered by the World Bank as having been one of the more effective projects in Afghanistan with respect to the rehabilitation of traditional irrigation channels." Communities interviewed after both projects have had nothing but positive feedback both on the training they received as well as the quality of the work done.

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The most commonly heard negative feedback is that the beneficiary communities want FAO or GoIRA to work on more of these schemes[24], especially as the nation faces an increasing number of droughts and a changing climate.

As noted previously, FAO also implements a number of smaller irrigation projects that are shorter in duration and focus on smaller-scale interventions that build off the IRDP and EIRP projects. These projects also spend significant time training dedicated MEW and MAIL counterparts so they can directly implement projects

in the future. Three of these such projects were related and overlapping, and ended with **The Programme of Improvement of Irrigation Systems in Kabul, Bamyan and Kapisa Provinces**[25]. All three of these projects[26], run in partnership with MEW, were focused on combating the devastating impacts of flooding and improving agricultural productivity in these three provinces. The projects did this by rehabilitating water control structures, training government staff and local users on water issues, and increasing community livelihoods through agricultural development, land rehabilitation and electrification.

Previous to the projects, farmers needed to continually re-build their water control structures with local materials, such as mud and rocks, that were easily wiped out in the face of raging floods. Continual powerful flooding causes runoff and land degradation; this meant that fertile soil availability and patterns in catchment areas were ever-changing and farmers could not properly plan their cropping patterns. The only way they could adapt was by gradually reducing their irrigated fields - and thereby reducing their wheat crops and their families' food security. In an arid environment like Afghanistan, functioning water retention and direction structures are essential if any sort of agriculture is to take place.

Another major challenge that the project area faced was degradation from decades of over-grazing and deforestation which caused rampant erosion; one project tackled these problems in Bamyan through a joint program with United Nations Environment Program on reforestation, terracing and check dams. In all provinces, the projects also addressed community needs for drinking water and other domestic water uses by rehabilitating *kareezes* and building water retention ponds. These construction projects not only led to better water management, but also were able to bring short-term construction jobs to communities. By being part of the building process, locals learned about improved canal construction. This means they are now able to repair their canals using the right materials, and build more canals if they had the resources. Both of these factors contributed to the sustainability of the irrigation works after the end of the project.

Throughout all three provinces, the projects had provincial staff from the MEW Water Management Department on each team: they were involved at every stage of the project cycle – from community mobilization and prioritization of sub-projects, to project design, to final handover to communities. MEW and project staff received formal training both in-country and abroad in project management,

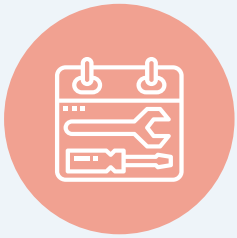
SAVED LABOR COSTS AS A RESULT OF THE TRAINING GIVEN TO LAND AND WATER MANAGERS BY IRDP/EIRP:

37%

ON CLEANING CANALS

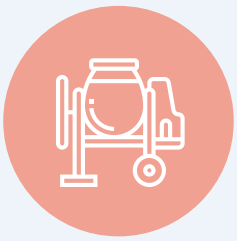
22%

ON ROUTINE MAINTENANCE



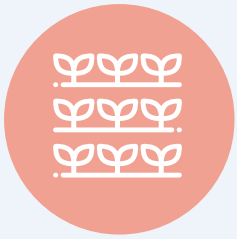
44%

ON REPAIRING STRUCTURES



21%

ON REPAIRING FIELDS



IN UNDER 7 YEARS, THE BAMYAN, KABUL AND KAPISA PROJECTS BUILT:

18
PRIMARY CANALS REHABILITATED

166
SMALLER CANALS REHABILITATED

635
HYDRAULIC STRUCTURES BUILT

9
STORAGE PONDS BUILT

501 kW
MICRO-HYDRO ENERGY GENERATED

665
STAFF TRAINED ON ADVANCED WATER ISSUES

surveying methods, and designing irrigation structures. Provincial MEW staff were also responsible for training communities through Community Development Councils. At the end of the projects, these MEW staff were able to work on similar irrigation rehabilitation and water control interventions without project support in other watersheds. Between courses, scholarships, and on-the-job training, many hundreds of MEW staff were educated through project funding.

By the end of one of the projects, farmers reported spending less time maintaining irrigation infrastructure and rebuilding damaged areas, and irrigation water was more reliable and equitably distributed among communities according to their needs. This helped reduce disputes by an estimated 75 percent between water users at critical periods during the cropping season, thus contributing not only to wheat improvements, but also local peace-building.

One project also oversaw several alternative livelihood support activities. These included orchard development, honeybee keeping, backyard poultry, seed development, flood protection works and catchment rehabilitation activities. These activities specifically focused on women, the landless, or other marginalized people who would not directly benefit from irrigation development activities. The activities ensured that everyone in the target areas benefited from the project. In total, almost 53 000 households belonging to the aforementioned groups benefited from jsut one of these combined projects.

Another way that the projects considered the marginalized were through social infrastructures included in the irrigation works. For example, washing platforms for women and footbridges for cattle were included in canal rehabilitations. Now families have more convenient water supply points, and women and children no longer have to walk long distances to fetch water.

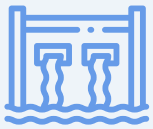
Farming households reported that they were able to expand the size of their irrigated fields - which meant improved food security, larger surpluses of produce to sell, and higher household incomes. Beneficiaries felt that they were adequately involved in all decision-making processes on construction, management, training, and ownership of their irrigation infrastructure. An independent evaluation found that the increased irrigated areas and yields brought about by FAO's irrigation projects in Afghanistan had led to improved living conditions of water users and to significant positive impacts on income and food security.

Another notable irrigation project is the ongoing **Project for Enhancing Agriculture Production through Irrigation System Improvement and Strengthening Institutional Capacity**[27]. This project is a collaborative effort between MAIL, MEW and the Ministry of Rural Rehabilitation and Development (MRRD). One component is centered on rehabilitation of irrigation schemes in rice growing areas of Kunduz, Takhar and Baghlan provinces. The Project began with the project team identifying irrigations schemes that needed rehabilitation, and developing proposals for a subset of these schemse after an analysis and design process was completed. As the project continues, maps for the schemes are being updated to give the community an overall view of each stage of the rehabilitation. The Project team has also conducted five basic water accounting trainings, including one held in Bangkok. These trainings help government staff plan and manage the use of scarce water resources, as well as delegate water management duties according to needs.

The Project has a second component focused on the Peace Medical Service (PMS) approach. The PMS approach was created in Japan, and focuses on community ownership and participation throughout all of the irrigation process, from planning and construction through usage and repair. Thus far, a training center, related accommodations and river bank protections have been completed. Curriculum, in the form of books, videos on the PMS methodology, and physical models of Japanese weirs have been developed to train the next generation of irrigation engineers and water managers in the design and use of simple but effective water management structures.

THE **EIRP** AND **IRDP PROJECTS** HAVE REHABILITATED 1000'S OF KILOMETERS OF CANALS. THEY HAVE ALSO BUILT THE BEGINNINGS OF A MODERN HYDROMET NETWORK, INCLUDING 181 NEW HYDROMET STATIONS AND 43 RIVER BANK OPERATED CABLEWAYS TO MEASURE WATER FLOW.

1 245 800
HOUSEHOLDS BENEFITED

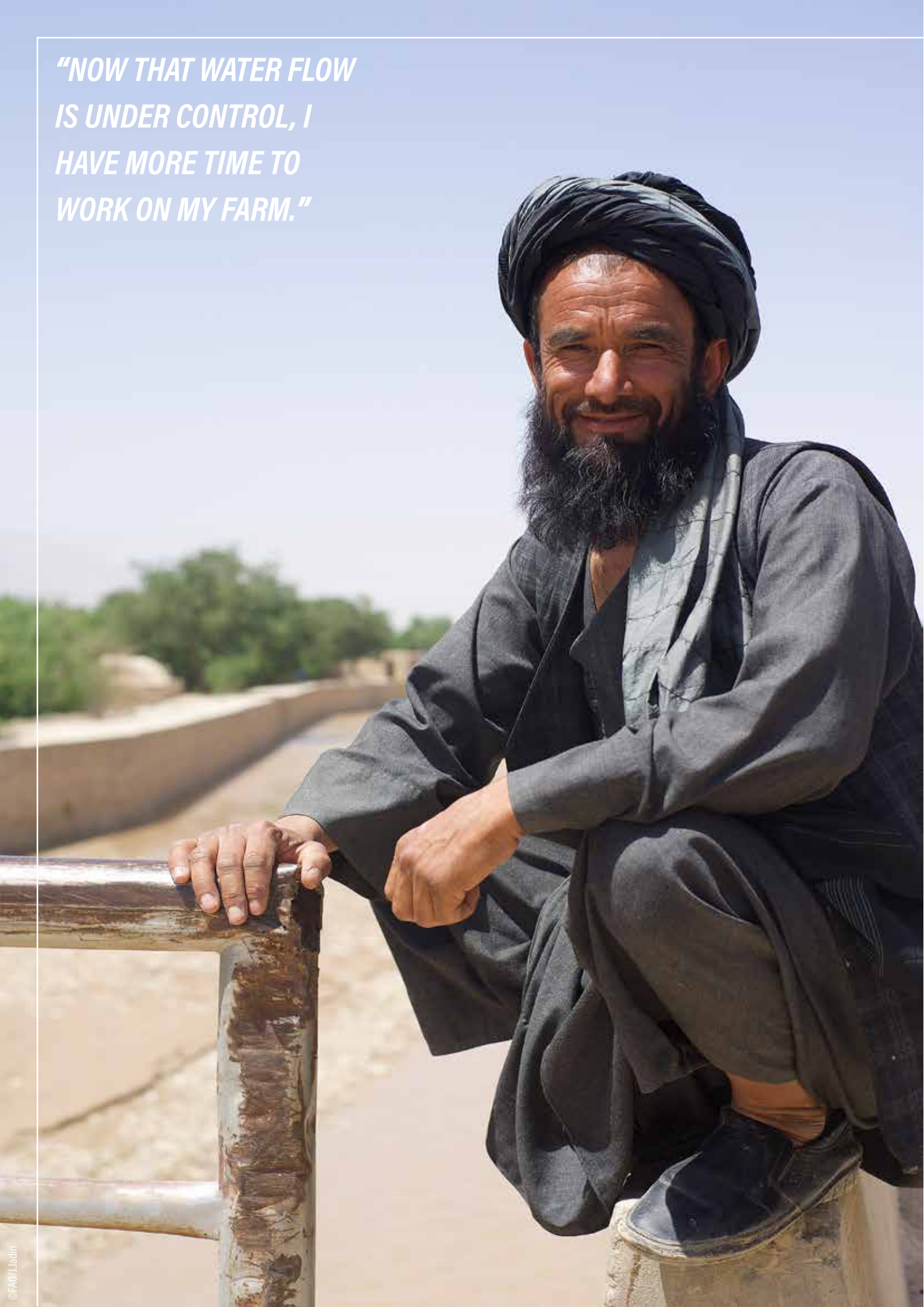


909
IRRIGATION SCHEMES REHABILITATED OR BUILT

993 000
HECTARES OF NEWLY-IRRIGATED FARMLAND

7000+
PROFESSIONALS TRAINED

“NOW THAT WATER FLOW IS UNDER CONTROL, I HAVE MORE TIME TO WORK ON MY FARM.”



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PROFILES OF SUCCESS: ASHRAF

The thirty men sitting on the floor circling the outside of the room stopped their animated chattering when the FAO staff walked in. These men had come from Ismail Khill village in Balkh to talk to us about water - and during this dry year, the issue was surprisingly about how they had too much of it.

In Balkh, though parched much of the year, spring floods always trouble villages. These floods not only wash away valuable topsoil, but houses, animals, and other property too. In order for farmers to keep growing crops in many parts of the province, a way to harness that excess water and save it for the planting season was needed. That's where the Irrigation restoration and Development Project, implemented by FAO and MEW, came in.

One man asked to speak up. He had worked on the IRDP project for years, and wanted to talk about benefits and continuing issues. That man was Ashraf, the village mirab.

Ashraf had never finished high school, and like his parents before him, became a farmer once he was old enough to work. Throughout the Soviet occupation, and under Taliban rule, he'd struggled to feed his family with his two-jerib (0.4 hectare) wheat farm, and part of that struggle had to do with decayed water infrastructure and poor local water management. In 2010, Ashraf was asked to be the local mirab, a formidable job, given the ancient water control system.

When the IRDP project came to the village a year later, it began the construction process by bringing the community together to discuss water needs and approve the canal plans. It then employed Ashraf and many of the men in the village to help build a large canal and smaller side canals, as well as gates to control the flow between the canals and into fields. This provided temporary paid employment to many of the locals, which they were able to invest into their farms. But, more importantly, for the first time in the history of the village, spring floods were being controlled, and the village had a reliable source of water all throughout the growing and planting season.

The canals benefited the whole community, but perhaps no one more so than Ashraf. Previous to IRDP, Ashraf spent the entire day running between canal gates, controlling the unruly flow of water with sticks, rocks and whatever else he could find. This was labor-intensive, and unreliable, which led to many disputes between villagers. It also meant he got to spend very little time working on his own farm, and very little time with his family. In short, his day was long and exhausting.

Post-IRDP, Ashraf said his job is much easier. Now, he simply opens or closes gates based on a schedule set by the local water department. FAO helped the water department determine the schedule, which is dependent upon water availability as well as farm size. Having such a schedule based on equitable water use has resulted in far fewer water conflicts, eliminating stress for Ashraf. Plus, with the extra time he has, he's been able to expand his wheat farm to include barley and a vegetable garden - which means better food and more money for his family.

After Ashraf was done talking, the rest of the men piped back in. Everyone was happy with the project, because the benefits were tangible on their farms. And, as one farmer noted, FAO had delivered on everything it had promised. But, they had one major concern, and that was that the canal still wasn't long enough. It didn't lead all the way to their village, so spring floods still threatened those homes and land beyond the reach of the canal. A chorus of voices emphatically pleaded that the canal be extended, by FAO, the Government, or anyone, so all of the families in the village would be like Ashraf's: financially stable, water-rich, and food secure.

2 INCREASED WHEAT AND CEREAL PRODUCTION

With the Seed Development Projects, FAO increased farmer profits 10 times over project cost.

Walking the chaotic streets of Kabul, one can barely traverse a block without the sweet smells of warm baked bread wafting into their nose. The bakeries of Kabul each are tiny art galleries for the senses. Bread in Kabul is not only a staple of the local diet, but it is an art form – the bread, or naan, is made of wheat and a sourdough starter, stretched out into a variety of novel shapes, then baked flat in a clay tandoor. After removal, the bakers punctuate the fresh bread with perforations and hang it to slowly cool. Bakeries are hung with triangles, circles, and fish-shapes of bread, waiting to be used to scoop up the flavorful sauces of Afghan cuisine.

Afghanistan once had a thriving seed and wheat industry and was nearly self-sufficient. But, over 40 years of conflict has destroyed that. Stable and abundant wheat production is fundamental for food security and food self-sufficiency in Afghanistan, where wheat is the staple crop. Wheat production accounts for more than 70 percent of the cultivated land of Afghanistan, but productivity is very low compared to neighboring countries. Threshing, harvesting, and storage are also issues, resulting in wheat that is grown and lost before it ever gets to market. These production and processing inefficiencies and moderate yields mean that there is significant room for growth in wheat. Wheat production and processing already generates approximately 1.3 million full-time jobs, accounting for one quarter of the agricultural GDP[28]. Reinvigoration and stabilization of the wheat sector would bring more jobs, and more of a critically-needed food to Afghans.

Through FAO and other donor-supported interventions, the wheat sector was reinvigorated again in 2002. It grew so quickly that in 2009 the UN Assistance Mission in Afghanistan predicted that for the first time in decades, Afghanistan would become self-sufficient in wheat production. However, increasing and extended droughts over that same period of time have resulted in decreasing wheat yields and lost development gains in the wheat sector. Like all other agricultural sectors, climate change and water availability underlie high productive capacity.

MAIL has stated that its' production target is 5.9 million metric tonnes annually, in the next five years. This increase would meet local demands, would allow Afghanistan to export the surplus, and would create over 200 000 new full-time jobs in wheat production and processing[29]. To see that these ends are met, GoIRA developed a national wheat policy in 2014. Its' goals are to sustainably develop the wheat sector to achieve self-sufficiency, improve food security and respond quickly during national food emergencies.

This will be achieved by increasing the irrigated area for wheat, by developing new varieties through research, by devising effective technologies to reduce loss, by providing adequate storage and distribution facilities, and by strengthening trade and value chains for wheat and other grain crops. Production of rice, barley and maize is also far from meeting consumption needs, so MAIL has developed a rice strategy that will improve cultivation techniques and develop new varieties that are able to use water more efficiently, saving water for other crops and other downstream water users.

However, these gains in production will not be met with more cultivated land alone. MAIL is also encouraging the private sector to take a lead by investing into small and semi-commercial producers - so that they become larger enterprises that can accelerate grain production and processing, through improved seed quality or new machinery/techniques that can improve planting and harvesting efficiency. The private sector could also step up and develop niche industries for Afghan wheat products, created for both domestic and international clients - if Afghans already make a variety of shapes and sizes of naan, diversification into other breads, pastas, or pastries that make use of the bountiful fruit of the country is not a far reach.

All these plans are underpinned by the farmer-centric approach MAIL has pledged to take. No amount of research, inputs, or marketing alone will sustain the Afghan grain industry if the capacity of the Afghan farmers, millers, bakers and others in the wheat industry is not strong. MAIL is also focused on promoting best practices, promoting conservation agriculture and training farmers on efficient use of seeds, fertilizers and water. Such practices will be key to the survival of the Afghan wheat industry as droughts become more and more frequent.

Conservation agriculture techniques are a return to past ways of farming that use land and crops in ecologically-efficient ways with minimal chemical inputs. Such techniques can save wheat productivity in the face of climate change; these techniques will be taught through PAILs, Farmer Resource Centers and extension services.

FAO ACHIEVEMENTS IN WHEAT AND CEREAL PRODUCTION

FAO has supported dozens of projects that directly or indirectly improved the production of wheat and other grains. These include all the irrigation projects mentioned in the previous chapter, as well as many of the other projects that will be discussed in forthcoming chapters. While the projects have evolved over the years, early wheat/cereal programming post-reconstruction was focused largely on **Emergency Wheat Response**.

After decades of conflict that lead to the destruction of its' infrastructure and the erosion of its social and economic base, Afghanistan was in dire need of emergency and rehabilitation measures in the early 2000's. Land lay fallow due to land mines, physical destruction from armed conflict, and years of severe droughts. After the Taliban was ousted, the economic situation of the country was further aggravated by large numbers of returning refugees and internally displaced people (IDPs) who were suddenly landless and unemployed. Many of these people were willing and skilled to work on farms or in other agricultural activities, but they needed a jump start. For this reason, FAO activities in the wheat sector were focused on emergency relief through short courses, tool procurement, and subsidized packages of good quality seeds and fertilizers.

One of the first one of these was an emergency wheat seed distribution project funded by the United States[30]. This project was designed to assist vulnerable rural families in the northern provinces of Faryab and Sar-i-Pul where the drought-induced food shortage was particularly severe. FAO's plan for immediate relief was to provide high-quality wheat seed and fertilizers from the spring 2002 planting to the autumn 2003 harvest. The beneficiaries included IDPs, returnees, widows, elderly people, orphans and other particularly vulnerable households. When the project concluded, it had reached 32 600 farming households, and given out 1630 metric tonnes of quality wheat seed.

FAO's wheat seed was a high-yielding variety; because of this, many of the farmers could not only produce enough wheat for their own consumption, but also had surplus to sell on local markets. Such an ability to generate income helped these farmers break out of the ceaseless cycle of poverty and debt they were trapped in. In addition, FAO promoted farmer-to-farmer exchanges of seed to disperse the seed to a larger number of farmers, some in extremely remote regions. The recipients were required to pay for the seed after the harvest; the revenue generated from reimbursement schemes was returned to the local communities for financing development programmes such as road, school and irrigation network rehabilitation. Harvest results showed that the best yields were in areas where implementing partners had strong agricultural networks; the need to support such relationships was an important early lesson that FAO used in all future programming.

While differences existed from project to project among the emergency wheat projects, there were overall patterns. One was that the distribution and monitoring of wheat seed, fertilizer and other inputs, was done by NGOs, with supervision and technical assistance provided by FAO. MAIL and PAILs were always close partners, and participated directly in the planning, coordination, and post-project evaluations. CDCs and other local institutions were also always involved in helping FAO identify the most vulnerable farmers and ensure that they received the inputs. Many of the projects also contained awareness-raising, Training-of-Trainers (ToT) and capacity-building segments so that everyone - from PAIL and NGO staff to farmers - would not only intelligently use the wheat seed and fertilizer, but would also learn how to sustainably grow the local agricultural industry.

And, as noted above, in most of the projects there was also a cost recovery component. Funds collected from the beneficiaries were used to construct everything from retaining walls and water diversion systems to veterinary clinics and sheep distribution centers - in short, they were meant to further agricultural development. These micro-projects were a pleasant by-product, as they benefited all community members, not just direct project beneficiaries. These projects amounted to USD 61 000 000 in emergency relief investments into Afghanistan, benefiting approximately 7 000 000 people.

While emergency response is necessary, it is not a sustainable way to address chronic vulnerabilities. In order for Afghan agriculture to prosper without donor aid, the foundations of the system have to be strengthened, and one important part of the foundation of good agriculture is good seed. A lack of quality seed is one of a multitude of factors impeding high wheat, potato, vegetable and other crop productivity in Afghanistan. Previous to 1995, no formal plant breeding was being done in country. Instead, seeds were kept by farmers and traded from year-to-year. These seeds were typically poor-quality: they often had low germination rates, they were susceptible to disease,

Since 2003, FAO has completed at least 95 short to medium-term emergency response projects, at least 30 of which were focused entirely or mostly on wheat production. These have been funded by the governments of Italy, the USA, Kuwait, Belgium, Germany, Switzerland, the UK, the Netherlands, Sweden, Norway, Japan, and FAO itself through core funding.

and they were low-yielding and not necessarily bred to be tolerant to Afghanistan's climactic extremes.

In a well-regulated seed industry, there are three steps which lead to quality end-user seeds. These are first breeder seeds, which are screened and grown to create a pool of "foundation" seeds, which then go through another breeding and inspection process to become "registered" seeds, both of which are produced by ISE and sold to private seed companies. The private companies then "certify" high quality seeds and sell to farmers. Post-war Afghanistan had no such system for testing seeds, meaning farmers were using low-quality seeds collected from their own or their neighbors' harvests. Poor seeds led to low harvests and wheat of dubious quality.

Testing and screening these seeds is an essential component of crop production because seasonal variation and site-specific environmental conditions affect the performance of crops; seeds must therefore be continually trialled to find varieties that are adaptive to changing climactic and environmental factors. This is especially true as Afghanistan faces the threats of climate change - higher temperatures, more droughts and unpredictable and unseasonable rainfall. These climate impacts have already been affecting wheat production in Afghanistan, and it was clear that better, more adaptive wheat breeds were urgently needed. Therefore, FAO prioritized developing a new seed industry in Afghanistan. It did this through three linked projects which together are referred to as the **Variety and Seed Industry Development Projects** (hereafter referred to as **"the Seed Project"**)[31].

The Seed Project began in September 2003, when the European Commission and FAO created a nationwide trust fund project designed to produce and sell high-quality and certified seed in Afghanistan, and to facilitate the growth of a private seed sector. The new Interim Administration promised to offer stability in the country for the first time in 30 years, and FAO intended to make use of this opportunity by strengthening the capacity MAIL (at that time simply known as the Ministry of Agriculture) to expand in-country production and distribution of Quality Declared Seed - especially to rain-fed regions that had not been adequately covered by previous seed projects. Subsequent continuous follow-on projects lasted until 2012. In total, nearly USD 38 000 000 was invested.

Throughout the Seed Project there were eight focus areas, including: developing new lines of wheat seeds, setting up a standardized system of production, building government capacity to manage the seed

sector, supporting the development of a national private sector for seed, promoting and marketing seed, coordinating the seed industry, regulating the seed industry, and improving general education and capacity so that a well-trained seed industry workforce could develop.

The project, in the initial phases, helped the Agriculture Research Institute of Afghanistan (ARIA) in the Ministry of Agriculture become the breeder seed production center for the country. FAO worked to train ARIA staff to systematically create test plots and strictly manage the trials and analysis of quality seed. ARIA stations were also equipped with modern facilities and equipment to continue breeder seed production, packaging and labeling.

Breeder seed that was found to be acceptable was sent to Improved Seed Enterprises (ISE), who were responsible for foundation and registered seed production. These registered seeds were sold to private seed companies, who in turn produced the certified seeds that were sold to farmers nationwide. Because ISE was a purely governmental organization, it was impossible to reinvest the money from seed sales to sustain the production cost. Such reinvestment is however an essential first step for developing a sustainable seed sector. With advisory support from the Seed Project, MAIL turned ISE into a semi-private autonomous body. Having this status allowed ISE to receive technical, financial and policy support from MAIL, but also run independently by reinvesting seed sale profits to cover the costs of seed production.

Along with transitioning the status of ISE to a parastatal body, FAO also worked to rapidly increase the number of private seed companies in country. Such quick growth was enabled by the establishment of The Afghanistan National Seed Organization (ANSOR), an umbrella organization that governs private seed company sales and production, and coordinates regionally through the Asia and Pacific Seed Association. ANSOR laid the foundation for commercializing the Afghan seed sector. By the end of the Seed Project, ANSOR was the focal point for all large-scale seed marketing contracts and negotiations, while private enterprises became the sole suppliers for Afghan farmers of quality-certified wheat seed.

Marketing this new industry was also a challenge. The seed that farmers traditionally bought or traded from other farmers was poor quality, but inexpensive. To convince farmers to pay for these new seeds, field days with crop demonstrations, quality assurance techniques, and packaging and storage facilities

OVERALL RESULTS FROM THE **SEED PROJECT** ARE NOTHING SHORT OF REMARKABLE:

OVER THE COURSE OF THE PROJECT, THE SEED-PRODUCING CAPACITY OF ARIA STATIONS INCREASED BY: **260%**

THE CAPACITY OF ISE FOR PRODUCING FOUNDATION AND REGISTERED SEEDS INCREASED: **458%**

ADDITIONAL LAND PRODUCING CERTIFIED SEEDS: **350ha**

INCREASE IN WHEAT YIELD THANKS TO THE NEW SEEDS NATIONWIDE: **30%**

were demonstrated at field days, traveling workshops and agricultural fairs. FAO helped with marketing by producing promotional items like posters, calendars, and press releases for these events, increasing the visibility of MAIL's efforts to improve the seed infrastructure of the country.

Another important achievement of the Seed Project was preparing and approving the Seed Law (2009) that now forms the basis for permanent institutional arrangements for the coordination of seed industry functions in Afghanistan. The Seed Law contains provisions for the establishment of the National Seed Board (NSB) as the overall coordinating institution and statutory body that provides the Minister of Agriculture with advice related to seed policy. Other affiliated bodies that also function under the Seed Law include the Variety Release Committee and the Seed Certification Agency. In 2013, MAIL fully integrated a Seed Certification Directorate into its' institutional structure. FAO built office space for the NSB headquarters at the newly-established National Seed Secretariat in Kabul, and a network of well-equipped seed testing laboratories across the country were built. Providing buildings for this new industry was an important first step in not only giving dedicated workspace to seed workers, but also in recognizing their place and authority in the Afghan agricultural production system. Having dedicated space made it possible for the NSB to become functional, and for the Variety Release Committee to became part of the NSB once the Seed Law came into force.

The project also helped develop a wheat seed certification system in line with guidelines from the Organization for Economic Cooperation and Development and International Seed Testing Association. This certification system was an important first step for developing Afghanistan-owned seed guidelines, and the methodology for developing this system will be extended to other major crops in the near future. While much of The Seed Project work focused on wheat, this system has laid the groundwork for using similar approaches with other major crops, such as rice, maize, vegetables, mung beans, chick peas, lentils, potatoes and higher-value crops like melons and other fruits.

Finally, capacity building was a critical component for this new sector; once a solid foundation with adept individuals was in place in the seed industry, FAO could focus on other areas of agricultural development. Throughout the 11 years of the project, hundreds of informal and formal courses and training events took place. The topics covered in these courses primarily

focused on seed quality assurance, seed evaluation, and seed certification. The project transferred 10 190 publications to stakeholders in ANSOR, MAIL, libraries and universities in Kabul. The project did a series of capacity building measures for almost 2200 people within the private seed enterprises, including study tours at home and abroad.

The most useful of these tours were in India and Turkey, because similar crops are grown in similar ecosystems within these countries, enabling easy knowledge transfer, and because the tours allowed Afghan enterprises to form business relationships with their Turkish and Indian counterparts. In total, 1677 ARIA and ISE staff were trained at home and abroad. Six government staff members were also supported to complete MSc degrees in seed technology abroad, and four returned to work for MAIL post-graduation. The project held over 131 field days where crop demonstrations, quality assurance techniques, and packaging and storage facilities were demonstrated. Over 18 000 farmers and wheat industry people came to these events.

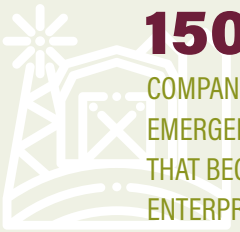
Meanwhile, the total financial value of all wheat seed classes produced by the project was estimated at USD 53 162 924, almost five times the project's total cost. Assuming that improved seed alone contributed to the wheat yield increase, the additional value of output, subtracting the initial seed and distribution costs, provided a net financial return amounting to USD 139 015 344. This is approximately ten times the total cost of the project, demonstrating an astoundingly high return on FAO productivity and donor investment, and an impressive financial gain for the GDP and people of Afghanistan!

8 171

NEW WHEAT BREEDING LINES WERE TESTED, AND 11 NEW VARIETIES WERE LATER RELEASED, 4 OF WHICH ARE RESISTANT TO THE UG99 STEM RUST DISEASE CREEPING THROUGH CENTRAL ASIA

18 000

FARMERS AND WHEAT INDUSTRY PEOPLE ATTENDED FIELD DAYS, AND **1677 ARIA/ISE STAFF** WERE TRAINED AT HOME OR ABROAD

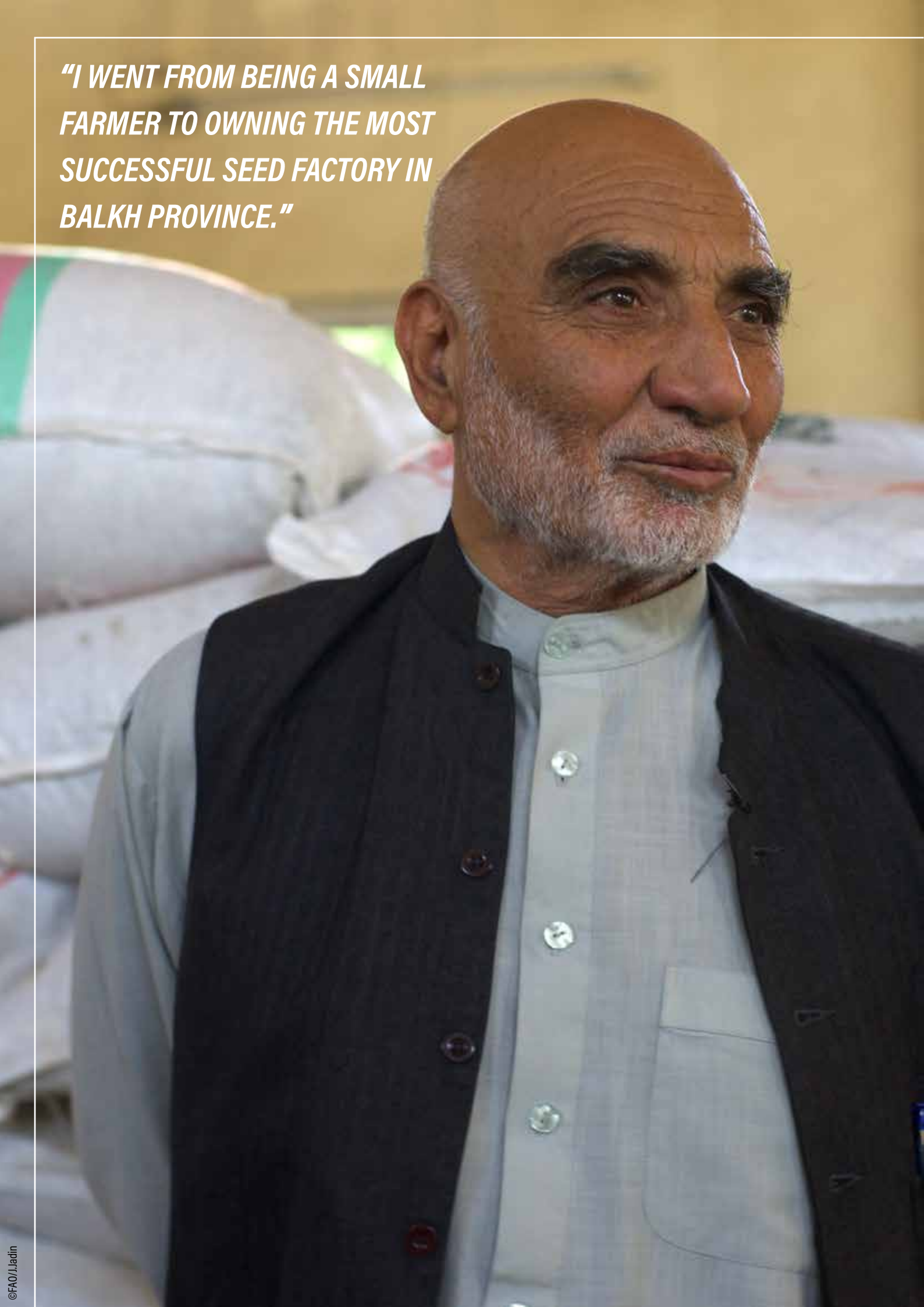


150

COMPANIES IN 28 PROVINCES EMERGED FROM **ISES** IN A PROJECT THAT BEGAN ONLY WITH EIGHT PILOT ENTERPRISES

USD **139 015 344**

NET FINANCIAL RETURN OF THE **SEED PROJECT,** WHICH WAS 10 TIMES THE TOTAL COST OF THE PROJECT


“I WENT FROM BEING A SMALL FARMER TO OWNING THE MOST SUCCESSFUL SEED FACTORY IN BALKH PROVINCE.”

PROFILES OF SUCCESS: SHAH MOHAMMAD

At age 77, after a lifetime of growing crops, Shah Mohammad knows seeds. Ever since he was 18 years old he's been a farmer of some sort, first as a pastoralist, helping his father herd sheep and goats, and then as a wheat farmer as he came to own more land.

When he first started growing crops, the seed, which he would buy or borrow from neighbors was low quality, and the wheat he produced was barely enough to feed his growing family. Things changed during the Russian occupation of Afghanistan. Seeds were regulated to some degree, and the quality went up.

During that time period, Shah Mohammad became a contract seed grower. He would grow seed that went through some amount of quality control before being sold on markets, leading to improved harvests for everyone. But, the bureaucratic hassle of getting these seeds still ended up resulting in crop losses. It used to be that when farmers wanted seeds, they had to get the signature of the head of the local agriculture department, then go to the government-owned seed company with the signature, order their seeds, go to a bank to deposit money, and then bring the deposit receipt back to the company to get the seeds. What often happened, he explained, is that by the time you went through this whole process, you'd already lost up to a week of valuable planting time. The results? Better seeds, but more hassle, and less time for crops to grow.

When the Seed Project started in 2003, Shah Mohammad was farming 5 hectares of land, and seed had diminished to pre-Russian occupation levels… low productivity and ill-adapted to the climate. Shah Mohammad was approached by Seed Project staff after they did nearly 40 community consultation workshops, and was asked if he'd like to help them start Shir Abad's first private seed company.

After many meetings to explain the project and its' potential rewards, he agreed. And, along with several others, he was given the training, machinery and seed inputs to get his seed company up and running.

According to Shah Mohammad "things were not easy at first. People were wary of this whole 'seed enterprise' concept because they'd been used to getting very cheap bags of seed from the government. It was difficult to get people to understand that by paying more for a bag of seeds, they'd gain more in the end. But, after one greatly-improved harvest, the idea caught on quickly."

His company , the Shir Abad Seed Company, is now the primary seller of privately-produced quality certified seed for not only Mazar-e-Sharif, but all of Balkh province. During every harvest, he gets seeds from official growers, and then runs the seeds through a mechanized selection process, which filters out the biggest and best seeds. These seeds are then further hand-checked for quality, bagged, sent to the government for ISE certification and sold.

Shah Mohammad still owns a farm, but it has grown from five hectares to forty, and the yield per hectare has tripled since he started using his own seed; his neighbors have all had the same gains. He now owns one of the biggest houses in the village and can put on quite the feast for visiting FAO staff and local officials who come to talk to him about seeds and success.

Shah Mohammad smiles and tells us that he calls his company "the FAO Seed Company," because without FAO, he would not be independently running his own company today. Nor would his cute young granddaughters, who are running around playing tag as we talk, have been able to receive the educations they are getting had they come from simple farming families.

3 INDUSTRIAL AND HIGH VALUE HORTICULTURAL CROPS AND VEGETABLES

The FAO SARD Project established 368 one-jerib pistachio orchards.

In cities throughout Afghanistan, one can see every color of the rainbow in the fruits and vegetables of the street markets and roadside vendors. And this cornucopia is reflected in the varied cuisines of Afghanistan, which are feature all of the horticultural products that the country grows, from raisins to pomegranates, and okra to oranges. These crops not only provide vitamins and minerals not present in grains and meat, but they bring greater earnings to farmers than fodder or grain crops. Horticulture is open to many of the smallest and poorest farmers, including women, who can improve the value chains through post-processing. They are also a profitable and legal option for those who might otherwise be tempted to grow poppy for the opium trade.

For these reasons, MAIL has made the development of industrial and high-value horticulture crops its' third strategic priority. Currently, horticulture covers about 360 000 hectares, almost 14 percent of the country's irrigated land area and employs more than 2 million people. It contributes 34 percent to the national GDP and has grown 5.5 percent over the past decade; already there has been a marked increase in year-round production thanks to covered farming. With a little additional investment, it is expected to expand even faster. And, while much of the country is chronically food insecure, some areas have the capacity to produce excess which could reach food insecure regions with proper value chain and infrastructure development.

The problems that may slow expansion are, however, many: inadequate supplies of high-yield crop varieties and certified seeds; old orchards that need replanting; insecure property rights that discourage long-term investment; insufficient access to credit; inadequate extension services; and poor on-farm management of water, crops, and pests. Farmers also have limited access to the cold storage and transport they need, and marketing remains an issue. After years of broken infrastructure and transport systems, Afghan horticultural exports have taken a dive in the global markets. Value-adding and marketing these products to appeal to global tastes will need to be a priority if this sector wants to reach its' potential. However, that also requires a cadre of trained processors, marketers, and technologists who can devise new ways to make food appealing to an array of consumers.

To develop the horticulture sub-sector, MAIL intends to focus on the development of high export potential crops and their markets; these would include high value horticulture crops, industrial crops and medicinal plants. Medicinal crops (cultivated and wild) have been important export items for centuries, and worldwide market research shows a growing demand for these products, particularly in Asia. Afghan medicinal exports are currently valued at USD 80-100 million annually, and can easily be doubled with the right investments. The income from all horticultural production was USD 700 million in 2015; the target is to increase exports by at least 5 percent each year.

MAIL plans to do this using seven integrated approaches. The first is by expanding the land base for these crops by 12 400 hectares per year through improved irrigation and infrastructure, then by increasing productivity through research into improved crop management and pest control, all supported by high-quality seeds and other inputs via a more effective extension system.

Production cannot be maximized without efficient ways to use and market products. That's why developing value chains for fruit and nut crops in which Afghanistan has been historically strong in export markets is another key priority. This will in turn be supported by developing PPPs that can invest in processing, marketing and other infrastructure supports for the value chains. MAIL also wants to enforce standardization through investments in branding, and by establishing Quality Control and Organic Certification Laboratories, as well as by upgrading existing processing facilities through collaborations with PPPs, other Ministries and the Afghanistan Investment Support Agency. Finally, they aim to develop the nursery industry by increasing access to certified seeds and planting materials, and by expanding the area for off-season production of crops.

As this next section shows, FAO has already been investing into these priorities for years through partnerships and projects with both MAIL and MEW.

Many FAO projects focus on larger issues, like irrigation, to bring about improvements in high-value crop cultivation. Increasingly FAO programming is turning towards directly building grower, processor and marketer capacity, and finding ways to engage a new private sector.

FAO ACHIEVEMENTS IN HIGH VALUE HORTICULTURAL CROPS

FAO has supported dozens of projects that directly or indirectly improved high-value crop production. These include many of the irrigation projects mentioned previously, which not only improved irrigation for wheat and rice, but also delivered more reliable water supplies to crops like pistachios, melons and apricots. Likewise, many of the projects that will be discussed in forthcoming chapters have focused on high-value horticultural crop production, as well as strengthening value chains for these projects. All of these projects have notably had an impact on women, because women are the primary producers of horticultural crops, as well as the primary processors of these crops. In addition to the projects that are noted in other chapters, this chapter highlights two projects which have been or are proving to be great successes.

One of these, implemented from 2009-2012 in close partnership with MAIL, was a project called **Promoting Integrated Pest Management (IPM)**[32], or the IPM Project. The objective of the project was to establish a national IPM programme within the Plant Protection and Quarantine Department of MAIL, and to train farmers in sustainable pest control and crop management through Farmer Field Schools (FFSs). The project was implemented in close collaboration with MAIL in 15 provinces of Afghanistan. It addressed many cross-cutting priorities for GoIRA, including institutional reform, climate-sensitive natural resource management, improving wheat and cereal productivity, and of course, producing high-value horticulture crops and vegetables and improving their value chains.

Crop loss due to pest damage is a major impediment to improving the productivity of all agriculture, especially high-value horticultural crops. Usually pesticides are used to eliminate pests, but this poses problems with environmental and human contamination, kills pests natural enemies, and leads to pesticide resistance. Pest outbreaks are increasing worldwide, often in places where they never previously occurred. This is an indicator of incorrect land management practices, human or animal transmission of disease, or changing climactic conditions that allow pests to spread to previously uninhabitable regions. Successful pest control therefore requires a broad understanding of the entire production system, from planting and crop management, to transport, to prevailing climactic conditions.

Historically, Afghanistan has had a climate that is ideal for natural pest control. Afghanistan's climate oscillates between two extremes: scorching heat in the summer, and frigid temperatures in the winter, both coupled with a long dry season. Such oscillation, with relatively short cooling and thawing periods, acts as a natural barrier to pest and diseases since most pest insects and pathogens cannot survive these harsh extremes. Because most of the insect pests in Afghanistan are migratory in nature and come from other parts of the Central and Western Asia region, weather extremes typically prevent them from staying long enough to cause a serious infestation. This has been changing in recent decades though, likely due to changes in weather patterns caused by climate change.

The IPM project made an important breakthrough in pest control by developing a number of sustainable practices not only to lessen pests and diseases, but also to improve the overall productivity of wheat, rice, melon and potato crops. The project began by conducting a series of field research activities throughout the country to identify the pest issues for high-value crops like melon, rice, potato, and pomegranate (and wheat and rice), and then created strategies and tools to address the pests in an environmentally-healthy and sustainable manner.

The first crop tackled was melon, which is plagued by the Baluchistan melon fly, a type of fruit fly that is extremely resistant to control measures used for other species, such as chemical insecticides, lures, baits, and physical or cultural controls. To address the melon fly issue, the IPM project did extensive research on melon fly control techniques in two provinces. MAIL scientists, with FAO support, found that bagging, a simple procedure where a homemade cloth bag is placed over the fruits, was extremely effective against melon flies. The bags also enhance the color of the melon, and increase the profit margin since no pesticides are purchased. An alternative techniques was using plastic mulch, which traps heat and kills fly larvae with the high temperatures. FAO introduced bagging and plastic mulching to melon producing communities in the northern and northeastern region of the country through FFS training, as well as to pomegranate growers, for whom it was equally effective.

Another crop addressed through the IPM project was potato. Potato is a commonly grown crop and staple food of Afghanistan. However, the conventional method of planting potatoes in large ridges with no post-planting work allows weeds to easily propagate. Colorado potato beetles, the primary potato pest worldwide, easily invades weedy potato crops because

Studies have shown that over 95 percent of sprayed insecticides and herbicides reach a destination other than the target species, diluting their effect and causing environmental contamination. IPM techniques can eliminate the need for these chemicals, preserving the environment and local community health.

the weeds are host plants for the beetles. To rid potato farmers of this beetle, FAO staff introduced a new planting method through FFS: farmers were taught to plant potatoes in small ridges and add fertilizer or manure into the ridges twice during the growing season. This simple method was successful at controlling weeds, pests and diseases, and also significantly increased potato yields.

All of these production practices were developed based on ecological principles of crop production, also known as conservation agriculture. Conservation agriculture is simple and cost-effective – often times it simply brings back land and cultivation practices farmers had used for thousands of years previous to the "Green Revolution." Conservation agriculture is a rapidly expanding field of research and practice worldwide. Techniques in this field of practice are designed to have minimal negative impacts on ecosystems and use existing ecosystem services (water supplies, shade from trees, natural insect populations, soil organisms) to naturally maximize plant growth, with as little processing and labor as possible. And because chemical pesticide and fertilizer use are decreased, there is a direct positive impact on human health, and financial well-being of farmers.

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The Colorado Potato Beetle, a scourge on potato crops worldwide.

Plants grown using improved management practices are sturdier and more robust, and are therefore able to cope with climactic changes better than plants that are dependent on artificial inputs. Post-project surveys showed that in the harsh environments of Afghanistan where FFS on IPM have been conducted, farmers have experienced no crop loss, while farmers who were not taught the IPM techniques suffered significant losses. Surveys showed that IPM not only reduced the incidence of insect pests, but also reduced water use and conserved soil fertility through the new cultivation practices. In the harshest and most water-stressed regions of Afghanistan, it will be imperative to continue to introduce conservation agriculture and IPM techniques to all farmers in order to sustain and grow their livelihoods through oncoming climate changes.

The project also built human capacity by training experts within MAIL. The institutional capacity building portion of the IPM project focused on: developing human resources, such as subject matter specialists, master trainers and facilitators who would be able to independently plan and manage an effective national IPM project; developing crop-specific appropriate technologies for IPM; developing methodologies for FFSs; establishing FFSs on IPM in target communities; establishing an operational structure and functional mechanism within the MAIL Plant Protection and Quarantine Directorate for planning; coordinating and monitoring all IPM activities in the country; and, documenting important outputs through the construction of a database and website.

Over the course of 4 years, the project trained 116 plant protection and extension officers (30 female) from the Plant Protection, Extension, Research and Home Economics Directorates in MAIL. The trainings, led by FAO technical experts, developed their expertise in IPM through four season-long ToT courses. This group now forms the core group of facilitators who are able teach IPM through FFS to local farmers. Additionally, a core group of eight master trainers/subject matter specialists were trained through a series of in-house and external courses. These eight master trainers now plan, coordinate and monitor FFS activities in the

provinces. Another 24 MAIL staff were given financial support to pursue MS degrees internationally. In total, these trainings and other educational opportunities have built the capacity of 148 staff members of MAIL.

Crop yields increased, overall production costs reduced, insecticide and fungicide use dropped to zero, use of fertilizers declined, water use improved, soil became naturally more fertile – all while farmers maintained or increased yields. On top of this, MAIL capacity for teaching and managing IPM nationwide was built. Through the IPM project alone, FAO was able to address nearly all of the strategic priorities set out in the NCADPP, which is a noteworthy achievement. Afghanistan has an incredibly talented pool of individuals ready to take on the agricultural challenges their country faces; with this training, they are one step closer to providing the agricultural expertise that Afghan farmers urgently need.

Another high-value horticulture project that FAO has been implementing since 2015 is the **Technical Assistance to Support Agriculture and Rural Development (SARD) project**[33], which is aiming to improve the living conditions of communities by turning subsistence farmers into small-scale producers of high-value crops. The project is being conducted in four districts of Herat. And, in only two years, the project has already had a notable impact.

For example, SARD has improved MAIL's understanding of agriculture production and local markets by doing a major survey of demographics and household livelihoods, reaching 151 640 people, over 50 percent of which were women. These surveys included questions on geography, populations, land ownership, major crops, animals, livelihood types and gender-specific economies. The data has been uploaded into an online MAIL system, which is accessible to anyone - whether in the government, academia or the general public. In the short term, this data has enabled MAIL project teams to better understand the livelihoods of the people they are working with, design more appropriate interventions, set up the appropriate CIGs and help community development councils (CDCs) identify gaps in development interventions. In the longer term, it serves as a foundation for better data collection in the agriculture sector. Afghanistan has had historically-weak censusing and data collection; better data are direly needed if the government and donors are to target interventions appropriately.

The CIGs have been one of the most useful outcomes of the projects, because they help farmers plan jointly,

ZERO REPORTED OUTBREAKS OF MELON FLY ANYWHERE IN THE COUNTRY SINCE THE IPM PROJECT BEGAN, AND MELON YIELDS INCREASED BY **77%**

WITH SARD **100 FEMALE FARMERS** RECEIVED INPUTS AND TRAINING SESSIONS ON VEGETABLE CULTIVATION IN GREENHOUSES. THEY PRODUCED 4438 KG OF VEGETABLES, EARNING **220 000** AFN

AS A RESULT OF IPM, POTATO YIELDS HAVE INCREASED 104% AND DUE TO THE SUBSTANTIAL REDUCTION IN THE COSTS OF PURCHASING CHEMICAL PESTICIDES AND FERTILIZERS, FARMERS HAVE SEEN THEIR PROFITS RAISED BY **43%**

14 213 FARM HOUSEHOLDS HAVE BEEN TAUGHT IMPROVED IPM TECHNIQUES THROUGH FARMER FIELD SCHOOLS. THERE HAVE BEEN NOTABLE YIELD IMPROVEMENTS IN ALL CROPS, AND PESTICIDE USE IS NOW **zero**

work cooperatively, and more easily communicate with local government offices. SARD project staff have worked closely with MAIL to develop by-laws for the CIGs, to raise awareness with farmers, to open bank accounts for revolving funds, to support legal registration of the CIGs, to train them in administration and management, and to help them work with FFS to identify farmer needs. Within the CIGs, focus group discussions are organized regularly, and female members participate in these discussions to ensure the needs of women are being captured in project activities. CIGs are also sold discounted inputs, such as seeds, saplings and equipment; the proceeds from these sales are put in the revolving funds which should grow and become self-sustaining as better harvests fetch higher market prices. Finally, the CIGs have been incredibly useful for making linkages between producers, processors and market actors.

NCADPP and are crucial priorities of MAIL. Farmers were taught by both DAIL staff and FAO teams, and were trained through on-the-job training, as well as 33 ToTs, building both PAIL and farmer capacity concurrently. The project also developed educational materials using the expertise available within MAIL, provincial universities, PAIL/DAIL technical teams, and FAO consultants. And, SARD has already established 28 FFS, and developed FFS curricula in close coordination with experts at MAIL.

Institutional strengthening has been an important component of SARD, as it is with all FAO projects. As a first step, district government staff were integrated into all project activities, combining work with on-the-job training. The FAO team has also helped MAIL prepare a work plan on operational support, procurement and technical assistance to field staff. The first phase of the project had a full-time information management officer

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Kabul market, and the bounty available from the farmers of Afghanistan.

Over 1249 farmers, processors, local entrepreneurs, government staff and university lecturers have been trained in saffron, milk, pistachio and fig cultivation and processing, beekeeping, food safety, greenhouse maintenance, vegetable cultivation, processing jams, pickles and tomato pastes, nutrition and agriculture linkages to food security, FFS management, revolving fund management, counter narcotics, improved wheat seed production, and administration and finance. Upcoming trainings will focus on food security and marketing, two topics which are highlighted in the

who developed a monitoring system for the project that tracked field activities and organized recorded data.

The Project is being implemented by MAIL/PAIL/DAIL/Ministry of Rural Rehabilitation and Development (MRRD) staff with procurement and technical assistance from FAO. And, in collaboration with a similar FAO project that supports household food and livelihood security through extension services, a Project Management Unit has been embedded in the MAIL General Directorate of Extension. This Unit provides management, financial and technical support

to SARD, direct support to MAIL-executed projects, and integrates MAIL strategies into project activities.

Also, as the MAIL strategy for saffron development calls for more concerted efforts on value chain development, SARD has revised its' future activities to reflect this policy. The SARD team established saffron associations in two districts and then linked the associations with the Saffron National Union, and distributed seven metric tonnes of saffron corms in 2017 alone.

Perhaps most importantly, the project is sustainable. SARD has created decent, long-term work and food security for vulnerable male and female farm workers and agricultural processors, responding to a SDG goal for Afghanistan. It has also built the capacity of farmers to improve agriculture productivity and processing, and it has improved farmer and processor access to markets through participatory social approaches. The Project will also be economically sustainable if farmers' continue to reinvest their earnings into the CIG revolving fund, which can support the purchase of new inputs and technologies far into the future.

Due to the success of the Project, MAIL has asked for a follow-on. Ideally SARD activities can be expanded into other provinces that have the land, climate and human resources to produce more high value crops in more areas. If successful value chains can be expanded, this will solve some of the problems with chronic food insecurity that the country faces. Agricultural products in districts with high capacity can be distributed to those areas that have less productive capacity, leading to improved health outcomes, national economic growth, and social stability for the entire country.

THE SARD PROJECT:

SURVEYED 25 700 HOUSEHOLDS TO DETERMINE WHICH LIVELIHOODS WERE MOST VULNERABLE, THEN

DISTRIBUTED 100 BEEHIVES TO 50 BEEKEEPERS,

PROVIDED TRAINING ON FOOD PROCESSING TO 120 WOMEN,

WHO PRODUCED 15 900 KG OF PICKLES, JAMS AND PASTES IN 2017,

AND EARNED 41 400 AFN FROM THE SALE OF THESE PRODUCTS.

PROFILES OF SUCCESS: AMIR

Amir is a farmer from the Karokh district of Herat province, and he and his family are beneficiaries of the SARD project. Amir comes from a meager background and works hard to feed and educate his family of 14 - large even by Afghan standards! Their only source of income is whatever is produced on the two jeribs (4000 square meters) of land that has been passed down to him from his grandfather.

Previous to working with the SARD project, Amir cultivated saffron on a half jerib, and the other 1.5 jeribs were used for growing wheat and vegetables. When he began planting saffron, he thought it would be his main source of income, since it is considered a high-value product. Unfortunately it didn't turn out that way, at least at first. Amir needed to be able to grow more per hectare to make cash income, and then once it was grown, earn more for it on the local market. With little market development for his saffron locally, he was able to sell his saffron, but never earned any net revenue.

This meant he was constantly struggling to feed his family and pay for school supplies for his 12 children. Then Amir became part of the SARD project and things changed for the better.

Amir joined SARD at the urging of project staff, who educated him about better cultivation practices for saffron. After SARD, Amir said that the "changes brought on by SARD and FAO during the last three years have been important for supporting agriculture and rural development here in Karokh. For me, the biggest help came from the training and inputs they gave me. SARD provided 100 kg of saffron corms, technical training on saffron production, harvesting and processing and linked us with local saffron associations and market actors."

He noted that The Common Interest Groups formed by the project staff from PAIL were also really useful. Having such structured groups helps the farmers avoid fragmentation and improves coordination among farmers and Government offices. This way the government officials can more quickly understand and respond to farmer needs. In the past, getting info to government officials about challenges was often confusing and laborious. Now the farmers are regularly convening to discuss their problems and make shared plans. The groups have also benefited from saffron drying machines and processing kits that have improved productivity and eased workloads.

Amir notes that "SARD training was really effective and this year I sold AFN 15 000 of saffron from my half jerib; I expect my profits to Increase to AFN 60 000 next year. This is three times what I used to earn! Now with this extra money, I can pay for doctors when my children are sick, and get them the school supplies they need"

His son Abdul, 17, left Afghanistan to go to Iran and earn money for his family working as a manual laborer. Just this year, he decided to come back home this year and help support his family by cultivating saffron and caring for livestock. He and his father had a long discussion on saffron and market demand, and together they decided to cultivate saffron on the entire two jeribs of family land, and bring the family back together again

"Now, between the SARD project and the road to our village that was constructed by National Solidarity Programme, we are producing more products and are well-linked to the local market. The economic condition of my family and my entire community is better. My family life is dependent on agriculture, so I look forward to continuing to try innovative and collective approaches to farming."

4 LIVESTOCK DEVELOPMENT

FAO led the way in developing a thriving private dairy sector in Afghanistan.

Livestock is another subsector with huge growth potential in Afghanistan. It is estimated there are currently 16.5 million animals belonging to almost 655 000 farming families. These animals graze only two-thirds of the 30 million ha of available rangeland, which is nearly half of the country's territory. Products from these livestock, particularly dairy, are a mainstay of the Afghan diet, with yogurts, cheeses, dried curd and butter being a core part of every family meal. Sheep, goat, beef and chicken are also prevalent in the diet of this landlocked country, and for many provide the only source of protein in diets that are otherwise heavily concentrated on grains (wheat and rice) and fats.

Livestock rearing is also the most inclusive agricultural production activity in Afghanistan; livestock are widely-owned by poor and wealthy farmers nationwide, they are the only livelihood for Afghanistan's Kuchi (nomadic herders), and they are largely cared for by females, creating much-needed employment for local women.

The livestock subsector already contributes significantly towards Afghan economic growth and employment, in part through creating import substitution for livestock products. The sector currently contributes 15 percent to the agricultural GDP and creates about 1.1 million full-time equivalent jobs. And, it's been growing at an even faster rate in recent years, thanks in large part to a rapidly growing national dairy industry, as well as improvements in vaccinating chickens, sheep, goats and cattle for a variety of cross-boundary diseases. However, for the domestic livestock industry to flourish to a point at which it can offset imports, new regulations covering the import and export standards for livestock products, stronger extension services, and a more nationally-driven health marketing component are needed.

To meet these ends, MAIL has developed a National Livestock Development Program. This Program broadly aims to increase production of fodder, dairy, meat and poultry all while improving market access for these commodities. The national strategy is focused on four elements related to production: strengthening animal breeding policy and research on indigenous cattle, ruminant and poultry breeds; increasing the availability and quality of animal feed, through improved production and research on commercial feed products; growing commercialization through a PPP approach where MAIL and the private sector share marketing and processing responsibilities; and finally, by supporting an evolution of extension services through PPPs, and innovative communication campaigns aimed to increase demand for Afghan products.

The strategy also contains four elements related to animal and public health: improving animal health service delivery through higher quality and broader veterinary training in line with international standards; controlling disease by establishing and extending a national animal disease surveillance networkthat links the provinces to a central diagnostic & research laboratory in Kabul; safeguarding public health by shoring up regulations and inspections on food safety for imported and domestic animal products; and, by raising awareness among farmers about the value of investing in animal disease prevention, possibly via PPPs which would be free to explore innovative ways in which to deliver relevant health information and services to farmers, no matter their location.

The NCADPP acknowledges that not every farmer can be reached through these initiatives, but there is regardless considerable potential latent within the livestock of Afghanistan. With limited inputs of technology, specialization, credit, and contracts, many farmers could migrate from subsistence to market-based agriculture. In recent years, progressive farmers have already begun to diversify their livestock production techniques, especially in peri-urban areas where there is a rapidly growing demand for animal products. MAIL has also noted that other small livelihood diversification tactics, such as apiculture and aquaculture, should be part of the farmers' livelihoods menu of options. As climate change adds even more uncertainty to an already immensely uncertain environment, farmers will need more coping strategies and locally-based income opportunities.

FAO has long been strengthening the Afghan livestock industry through dairy sector development, disease prevention, and small-scale poultry projects; some of this work extends beyonds national borders. With a little added marketing and processing support, the livestock sector will be poised to be a major income generator for Afghanistan, and perhaps even a path to better regional relations.

Dairy is a key source of household income, employment opportunities and nutrition for the people of rural and peri-urban Afghanistan. It provides farmers with modest and regular cash income, covering basic daily expenses and food. Dairy also creates many jobs down value chains, from providing feed, to milk production, to processing, to distribution and marketing of end products. Women are the center for the dairy production activities at the household level, and thus dairy is an important source of income for rural women. And, dairy is an important part of the diets of pregnant and nursing women, playing a vital role in maternal and infant health.

In the past, Afghanistan was able to produce enough dairy products to serve its' own needs. However, low milk production from local breeds, animal diseases, poor feed quality, droughts, and poor infrastructure have resulted in insufficiencies in dairy products since the 1990's. Afghanistan has been importing dairy products since, which means reduced profits and job opportunities for Afghan dairy farmers.

In 2005, FAO and MAIL, began a series of projects on **Integrated Dairy Scheme (IDS) Development**[34] in Afghanistan, which eventually expanded to five provinces and continues today. The IDS projects cover the entire dairy value chain, from feed production, to breeding, to milk production and processing, to marketing the final products. Initial support for this project, came from the Government of Germany, but positive results quickly drew more support from other international donors. Since the beginning of the project FAO has mobilized over USD 13 million to support dairy industry development in Afghanistan, through numerous small and large projects, which together form the entire IDS Project. IDS activities have produced laudable results, and are among the greatest success stories for both the FAO and the agricultural industry of Afghanistan.

Drawing upon dairy models worldwide, FAO, MAIL and the private sector developed an IDS model for Afghanistan. The idea behind IDS is that farmers organize into village-level dairy cooperatives, district-level dairy cooperatives, and provincial-level dairy unions. Each of these local cooperatives are provided with training and inputs, such as animal husbandry lessons, semen for creating hybrid cattle, and vaccinations. These cooperatives are trained in hygienic milk production and marketing, both of which help sell Afghan dairy products to a possibly skeptical public. Farmers are paid weekly for the milk they deliver to milk collection centres, giving them a stable source of income. The money paid to dairy farmers has been steadily increasing since the Projects began; in 2016 alone the unions paid out a total of AFN 114 million.

Each village cooperative has a milk collection centre which is linked a district-level collection centre. These district centres have refrigerated rooms for cooling the milk immediately after it is brought in. The cooled milk is transported to provincial milk processing plants using refrigerated trucks. The plants, built through FAO support, contain high-quality computerized equipment, refrigerated rooms, laboratories and packaging equipment. Each of these plants are run by trained staff who check milk quality and then make and package pasteurized milk, yogurt, buttermilk, butter, *chaka* (quark) and cheese. These facilities allow Afghan dairy products to be properly transported, treated and stored, and now hold a major share of the new national dairy market.

Producing good milk is not just about good processing: inputs are also key. One of the most important inputs is high-quality feed. Nutritious feed produces milk with higher milk fat and protein content, which has more uses and fetches higher market prices. Therefore, another focus of the IDS Projects was to improve feed types and feeding patterns, using high-yielding fodder varieties of sorghum, berseem, lucerne, and oats. Approximately 75 percent of the farmers in the Dairy Projects are now cultivating these crops, which they mix into specialized formulas they were taught to make through the dairy cooperatives. They also sell fodder to the dairy unions, which have separate livestock feed processing plants on site; the unions mix it into formulas, add in vitamins and minerals, and resell to farmers.

At the national level the Afghanistan National Dairy Association was established to govern the dairy sector. The Association is an umbrella organization for all dairy sector producers, processors, input suppliers and other stakeholders. Through it, the people in the dairy industry are able to better communicate, cooperate, and distribute resources to meet local market demands. The Association has played a key role in establishing local and national markets for Afghan dairy products by helping producers market better to these markets.

Afghanistan has enough cattle and dairy farmers to produce all of the dairy products that the country needs, but the country still imports. The most recent available data suggests that Afghanistan imports USD 42 million in dairy products annually[35]. While the country is still a way off from covering such a large deficit, the increased dairy production rates brought about through the IDS projects are nonetheless

The formation of dairy cooperatives empowered communities at the grassroots level, and proactively included women. In many developing countries, such cooperatives have driven the growth of the dairy sector and led to women's economic independence.

EXEMPLAR RESULTS FROM THE **DAIRY PROJECTS**:

70%

OF PROJECT HOUSEHOLDS HAVE CROSSBRED CATTLE, WHICH PRODUCE 3.5 TIMES MORE MILK THAN NATIVE BREEDS.

96%

OF CATTLE IN DAIRY PROJECT AREA FREE FROM FMD AND TICK DISEASES EQUALS HUGE IMPROVEMENTS IN MILK HYGIENE.

5

DAIRY UNIONS ARE NOW REGISTERED IN 5 PROVINCES IN AFGHANISTAN, PROCESSING 25,000 LITERS MILK/DAY.

235%

PERCENT INCREASE IN DAIRY FAMILY INCOMES: FROM USD 371 TO 872/YEAR, MOST OF WHICH IS EARNED BY WOMEN.

laudable and have laid a very solid foundation for further scaling up in this sector. Current imports are of unknown quality, and may contain unsafe additives or expired ingredients. The IDS Projects have created a growing domestic market for locally-produced milk, ensuring more Afghan people have access fresh, healthy, additive-free milk products.

Finally, FAO also helped establish 26 Veterinary Field Units (VFUs) under the Dairy Projects to provide animal health services to farmers. This was part of the government's public-private partnership strategy to extend extension services to farmers: as private service providers, VFUs are contracted, and paid to provide animal health services on behalf of the government. These VFUs are important for monitoring, reporting, diagnosing, and developing control projects for diseases affecting animals including those that are easily transferable to humans. The VFUs also support artificial insemination technicians who are trained to teach and assist farmers to breed better cattle.

These VFUs have supported linkages with other FAO livestock projects, including the ongoing **Transboundary Animal Diseases (TADs) project**[36]. TADs are easily-transmissible diseases that are of significant economic, trade and/or food security importance for many countries. Control of these diseases requires cooperation between countries, which often leads to improved international trade, trust, and public good. Control of TADs also requires domestic approaches, such as awareness campaigns, veterinary assistance, and extensive vaccination programmes. The TAD project was designed to provide a framework for control of Foot-and-Mouth Disease (FMD) and Peste des Petits Ruminants (PPR) that can be sustainably implemented and replicated to apply to other TADs.

Among TADs, FMD and PPR have the most significant negative impacts on animal production, national economies and livelihoods worldwide. For both diseases the World Organization for Animal Health has the mandate to certify that countries are disease-free. This is significant, because once a country is disease-free, it can access lucrative international markets with its' animal products. Because these diseases are so widespread in Afghanistan, becoming disease-free is a very long-term goal. But, by following proven control guidelines, these diseases can be eradicated locally or sectorally in the shorter term.

Globally the World Organization for Animal Health and FAO developed roadmaps for individual countries to set objectives and measure progress on the path to

disease eradication. For FMD and PPR, Afghanistan is part of the West Eurasia roadmap, along with Iran, Turkey, Pakistan, and others. Being part of a roadmap gives countries a platform for sharing information and developing common strategies. The West Eurasia roadmap has identified that there is a significant flow of animals moving from Afghanistan and Pakistan to Iran and Turkey following higher meat market prices. This can happen within the space of less than a day as trucks loaded with animals traverse these countries and stop at informal markets along the route. This unregulated trade has resulted in an increased prevalence of TADs regionally in recent years, and is compounded by faster trade, conflict and civil unrest, and deregulation and decentralization of animal health services in many countries.

The TADs project is focused on outreach, building veterinary capacity, and improving relations with neighboring countries with respect to animal health. The most innovative components of the project have been on awareness-raising about animal disease, for both sedentary communities and for the *Kuchi* herders who roam the vast rangelands of Afghanistan. The Kuchi are the owners of the majority of the sheep and goats of Afghanistan, yet they are also the hardest to reach with information because of their nomadic nature. The TADs Project has been addressing this challenge by assessing Kuchi movements, tribal conflicts, and mapping live animal markets that Kuchis attend. Such information allowed the FAO project team, MAIL and the Ministry of Tribal Affairs to devise a creative way to reach the Kuchi - through students from nationwide Agriculture and Veterinary Institutes.

Students from these institutes were trained in public relations and are assigned as focal points for various groups of Kuchi. The focal points regularly distribute picture-filled brochures to the largely-illiterate Kuchi, providing them with info on how to recognize animal disease, how to treat it, and when and where vaccinations will be available. The students have also created radio programs that discuss animal diseases, which get played monthly in areas where herders congregate. Thus far, 8 of the 20 veterinary institutes in the country have signed onto this project. The TADs project has also provided VFUs with training on sample collecting and reporting, and it has established mobile VFUs in areas that were not previously serviced by the sedentary VFUs; these mobile VFUs travel to animal markets and Kuchi encampments to vaccinate on site.

The Project has also been developing animal disease laboratories in country. The Central Veterinary Diagnostic and Research Laboratory is now equipped

with everything it needs to test for FMD and PPR; tested samples have been sent to the FMD World Reference Laboratory in the UK which corroborated test results, showing that the Kabul Central Veterinary Lab is up to worldwide standards. The lab was also equipped with machinery that will help domestic animal products meet the sanitary measures defined by the World Trade Organization – which now allows Afghanistan to be a fully-participating member when it comes to trade in animal products.

MAIL capacity on veterinary policy has been improved through trainings on value chains, risk analysis, and international standards. In 2017, FAO helped MAIL establish a TADs unit within the General Directorate of Animal Health and Livestock. This new unit maintains relations with the World Reference Laboratory in order to constantly identify vaccines best suited to the disease strains in Afghanistan, as well as procure the needed yearly supplies of PPR and FMD vaccinations.

Finally, the TADs project doesn't stop at the national borders. The TADs project works with neighboring countries to engage in science diplomacy. The Project held five bilateral coordination meetings with Pakistan, Iran and Tajikistan in 2017, as well as two multilateral meetings in which veterinary service members from all countries met to discuss TADs issues. One of the most important outcomes of these meetings was that memorandums of understanding for cooperation on TADs between the veterinary experts of Afghanistan and its' neighbors have been drafted, and each countries animal experts are now communicating regularly and working together to share expertise and find regional solutions to TADs. These meetings are discussed further in chapter 8.4.

IN JUST OVER A YEAR THE **TAD PROJECT** HAS VACCINATED:

12 000 000

SHEEP AND GOATS FOR PPR

226 000

CATTLE FOR FMD

Cattle and small ruminants are not the only important agricultural animals in Afghanistan: chickens are also commonly kept by smallholders nationwide. That's why, since 2003, FAO has implemented a series of large and small **poultry projects aimed at improving small-scale or "extensive" poultry farming**[37]**.** Extensive farming is a low-input system in which small flocks of chickens are kept for both economic and social purposes; the system is relatively organic and produces cheap, high-quality protein. The chickens are also an asset that can easily be converted into cash. Extensive poultry production therefore has the potential to improve food security and alleviate poverty across Afghanistan. Further, women are the primary owners of poultry; therefore, like the Dairy Projects, the Poultry Projects contribute to women's economic independence.

The three major Poultry Projects were implemented in Balkh, Samangan, Jowzjan, Sar-i-Pul, Kunduz, Takhar, Baghlan, Kabul, Kapisa, Panjshir, Nangarhar, Ghazni, Herat, Bamyan and Parwan provinces, covering nearly half of the country. While the objectives and methods in each project were slightly different, there were many commonalities. For one, each project began with baseline surveys to determine which potential beneficiaries had the greatest needs. This was followed by implementing the FAO model for small-scale poultry sector development: first establish and educate village poultry groups, then train a cadre of Village Group Leaders, who would lead village poultry groups and provide support services, such as regular vaccinations, supplying feed and marketing the eggs and meat.

When the groups began, they collected a small amount of money from each trainee, which was used to create revolving funds from which each group could purchase inputs. Group education included a combination of formal training and practical implementation done by female staff; topics included feeding and watering, record keeping, saving schemes, marketing, building coops and equipment, breeding management, poultry health and proper composting of waste. In all projects, FAO also gave out substantial feed, coops, chicks, and feeders to start groups on the path to self-sufficiency.

Weekly egg-selling systems were established by linking

the group leaders with district bazaars and big city food shops. Organized input-output delivery systems were established or strengthened for all groups, resulting in district distributors buying feed, vaccines and equipment, and selling them to the group leaders, who would make them available to their groups. FAO also purchased vaccine for beneficiaries to combat Newcastle Disease, Infectious Bursal Disease and fowl pox. One project gave out 21 tonnes of mung bean to help the women sprout pulses which could be used to feed the chickens; this supplemented scavenge feeding, produced higher-protein meat and increased egg yield by 30 percent.

Backyard chickens represented a learning experience for families and neighbours to learn about the complexities of food production. And, although poultry income alone is not sufficient to enable an average Afghan family to rise above the poverty line, it can be the first step out of poverty. As an example of this, during one project, reports from target villages showed that more than 20 percent of beneficiaries had purchased sheep, goats and even female calves from their newfound poultry income. The climb out of poverty will be steep for many of these families, but results from the Poultry Projects showed that sometimes a little push up the slope is all that is needed.

RESULTS FROM THE COMBINED **POULTRY PROJECTS:**

69 247
WOMEN TRAINED

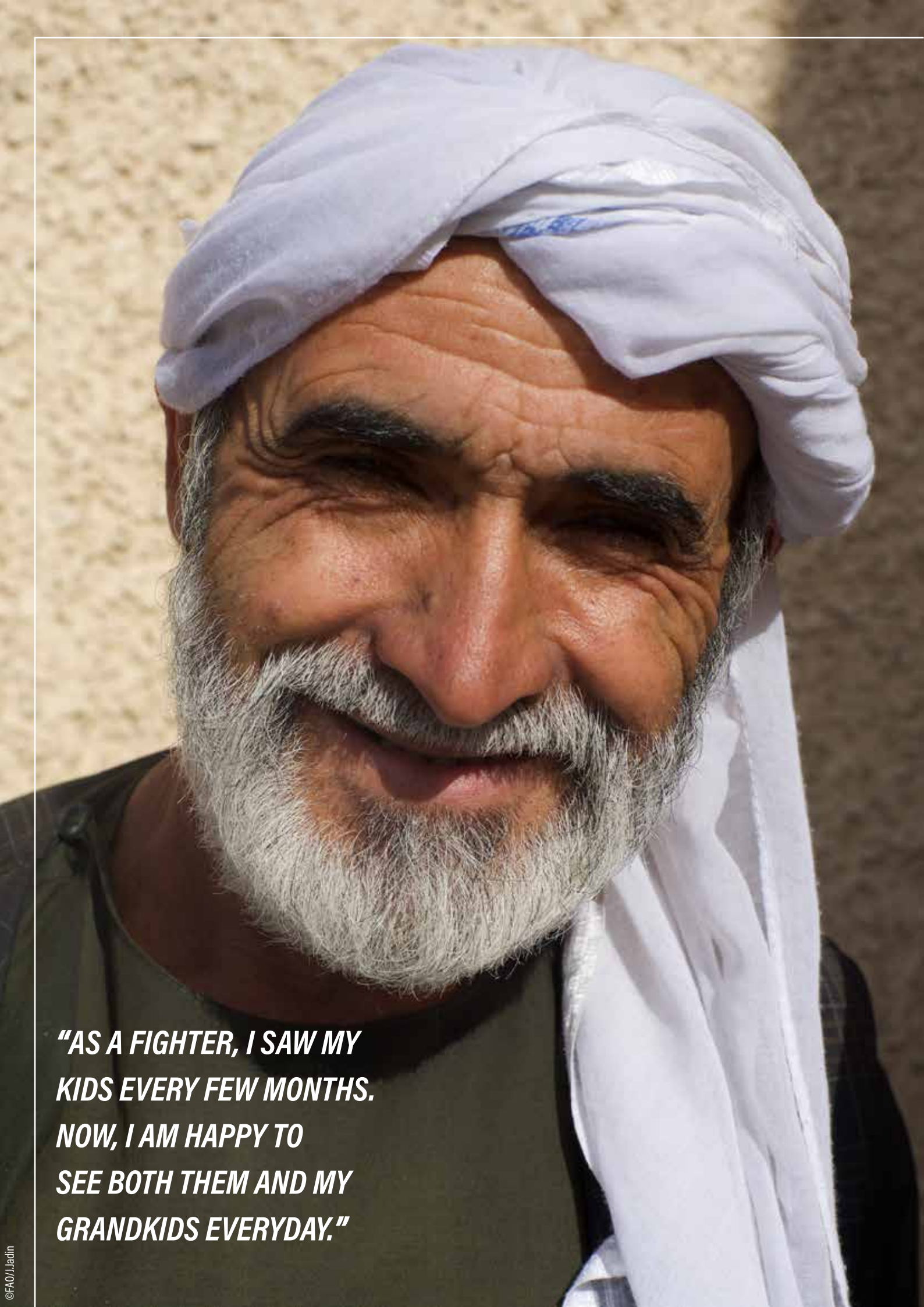
783 392
PULLETS DONATED

60 805
IMPROVED COOPS BUILT

1 757 603
CHICKENS VACCINATED

FLOCKS GREW FROM 2.5 TO
15.4 HENS

THE WEIGHT OF CHILDREN
WAS **HIGHER**
IN BENEFICIARY FAMILIES


"AS A FIGHTER, I SAW MY
KIDS EVERY FEW MONTHS.
NOW, I AM HAPPY TO
SEE BOTH THEM AND MY
GRANDKIDS EVERYDAY."

PROFILES OF SUCCESS: NAZAR

"I decided to trade in my machine guns for milk cans."

These were the first words Nazar said to me as we were sitting in the Balkh dairy union, and suddenly this chat about the dairy machinery and butter-making took a very different, and very intriguing turn.

Nazar grew up in a small village in Balkh, and after he finished high school he joined the Mujahadeen to fight against the Soviet occupying forces in his country. Joining the Mujahadeen for him was partially a passion, but mostly a job. He came from a farming background, and with no more than a high school education from a village, he knew that if he wasn't a fighter, being a subsistence dairy farmer would be his future. And that wasn't a future that could easily sustain a family in troubled times.

During his time as a fighter, throughout the Soviet occupation, and then during the rule of the Taliban, he came home when he could, and eventually married and fathered two sons and three daughters. They were born, they grew into teenagers, and then young adults, but to his dismay, he got to see very little of them on his long trips away from home. But he kept on fighting, because it supported his family better than dairy farming in the war-torn, drought-affected countryside would.

Then, in 2002, on a visit home he was invited to join a talk on dairy cooperatives. This talk that was part of the initial community outreach during the commencement of the Dairy sector projects. During this meeting, FAO staff explained how they wanted to build an integrated dairy system that would eventually be privatized and sustainable, and would help farmers earn far more than they did in the past. They needed volunteers to take on the task of running milk collectives, and would be given training and support on milk sanitation and business management. After years of managing his fellow fighters, Nazar knew he was more than capable of this challenge.

"The next day, I went back to my commander, gave him my guns, and told him i was going into the dairy business. I wanted to be there while the youngest of my children and my young grandchildren grew up. And I never looked back."

Nazar was trained by FAO on how to set up a milk collection center, through classes in management, logistics, advertising, sanitary, and testing techniques. Nazar learned how to hire reliable employees and supervise them as they picked up milk from farmers, tested it for fat content, checked it for disease, and delivered the milk to the local dairy union for processing.

Nazar also received training on breeding, rearing and hygienic milk collecting techniques, which he and his wife apply at home on the dairy farm they still owned. Through support from the FAO, he was able to interbreed his native cows with Holsteins and is producing significantly more milk on his own farm. His neighbors and his whole community have been able to do the same.

Today Nazar is not only the owner of the largest milk collection center in the Balkh dairy cooperative, he is also the deputy head of the cooperative. Two other friends and former fighters are also part of the dairy union board. After they saw the extra money Nazar was earning after his first year in the project, they too turned in their guns.

Nazar noted that with success come challenges. One is that the cooperative needs new machinery, and despite their profits, buying expensive equipment is difficult. Another is climate change. He notes "It's been hard to find grazing areas for our cows this year, and it has been getting slowly worse for a long time. We know this is climate change, but we don't know what to do about it." Maybe, he suggests, a next step for FAO and the government will be to "help the dairy sector find fodder crops and cattle breeds that are hardier in a dry climate." Hopefully, that will be the case, because no one wants Afghanistan to have a future with more guns than milk.

5 CLIMATE SENSITIVE NATURAL RESOURCE MANAGEMENT

Climate models predict Afghanistan's average temperature could rise by 6 °C by the end of the century.

2017 was once again one of the hottest years on record – third in line behind 2012 and 2015, two years in which El Niño wreaked havoc on worldwide precipitation patterns. For Afghanistan, while 2017 didn't bring any major food production crises, the changing climate means the country is always hanging on the precipice of environmental collapse. This year, 2018 is an example of the envionmental vulnerability of Adghanistan: a drought during the 2018 winter wet season has left the country without adequate wheat or livestock fodder. Early in the year, families were already reporting drought-induced migration and as 2018 draws to a close, Afghanistan is now in a major food security crisis, the third worst in the world according to the recent Integrated Food Security Phase Classifcation (IPC).

Climate change is a particularly noxious issue for Afghanistan. The country contributes only 0.06 percent to the world's greenhouse gas emissions, yet it receives a disproportionate share of climate change impacts. Its' mountainous and foreboding terrain, its' poorly managed water supply, and its' overall political instability make it extremely vulnerable to environmental shocks, made worse by climate change. And in an insidious negative-feedback loop, climate change in turn may exacerbate political instability. The growing poppy industry in Afghanistan is one example of how this is happening already: poppy grows on dry soils, and hectare per hectare, it brings in more cash than many other crops. As climate change brings about more droughts, this crop, as well as the violence that comes with it, may spread.

Despite these continual threats, Afghanistan remains a country rich in natural resources. They have 1.7 million hectares of forest, 30.2 million hectares of rangelands, 117 642 hectares of fruit trees, and 7.3 million hectares of irrigated or rain-fed farmland, all in all totaling 61.3 percent of the land[38]. Although Afghanistan has made notable advances in cataloging its natural assets, passing laws and developing policies about equitable and climate-smart natural resource management, progress has been constrained by contested land ownership and land grabbing, and the slow case-by-case approach used by the National Land Authority. Continued political instability and lands that are no longer under government control also contribute to uncertainty about the who's and how's of land management for the good of local communities.

To protect these assets, as well as address the climate requirements defined through the UN Framework Convention on Climate Change, MAIL is coordinating closely with the National Environmental Protection Agency (NEPA), MEW and MRRD to implement its' Natural Resource Management strategy. This strategy aims to support the sustainable economic development of communities which depend on green environments, healthy soil, clean water, and rich biodiversity. The entire strategy is divided into four pillars, the first of which is community-based sustainable forest management. This pillar focuses on creating Forest Management Associations that can manage value chain development of local fruit and nut producers, as well as on establishing provincial Forestry Research Centres and linking them to existing research stations.

The second pillar supports rangeland and medicinal plant management, and requires local communities to conserve rangeland by introducing rotational grazing practices, by holistically managing ecosystems from the watershed level and by establishing local producer associations that can backstop these efforts.

The third pillar supports protected area management, by enforcing laws and commitments tied to international biodiversity conventions, and by strengthening ecotourism. National protected areas will gradually be expanded, and scientific surveys will catalogue and prioritize indigenous fauna and flora in nine targeted protected areas.

The final pillar supports institutional and human capacity for staff within MAIL and PAILs, so that they are better able to develop natural resource-related regulatory frameworks, policies and implementation plans. Staff also will be trained to collect and analyze natural resource data, and staff positions will be realigned as hubs for natural resource planning and technical support are established in the provinces.

Overall, MAIL is making a shift towards placing natural resources in the hands of communities, and creating linkages between rural and urban areas. These linkages are needed so that the vast rural parts of the country can continue to not only grow food, but ensure a clean supply of air and water for everyone in the country, for the next generation, and even farther into the future.

Natural resources need to be protected not only to support healthy food production, but also to ensure that Afghanistan has a ready supply of clean drinking water and air, particularly in increasingly-overcrowded urban areas. A healthy environment leads to a healthy population, which leads to a better lifestyle for all.

FAO ACHIEVEMENTS IN CLIMATE SENSITIVE NATURAL RESOURCE MANAGEMENT

FAO projects in Afghanistan have not historically focused on climate change adaptation or mitigation – at least not as the driving philosophy behind the project. In a country that is war-torn and with a populace struggling for survival, climate change is often not at the forefront of people's thoughts. That said, if the international community wants to see Afghanistan prosper on its own, climate change considerations absolutely must be built into all future programming, as climate change will present an ever-larger challenge to implementing all environmental projects, and many social projects as well.

This is because climate change is a "threat multiplier." This means that while climate change may not cause social conflict, it does exacerbate existing tensions and can make any unsteady situation, whether social, health or environmental, even worse. An increasing number of scientific studies have documented, world over, how climate change impacts such as droughts and heat waves are increasing civil violence and spurring on larger population migrations. A number of UN reports, position papers, statements, and even security council resolutions have made the same claims. Therefore, addressing climate change and preventing environmental disaster does not just protect agriculture; it also promotes peace and security.

FAO programming has always focused on increasing the resilience of the Afghan people and institutions - and ultimately, resiliency is what matters in the face of climate change. However, climate change does bring unique challenges, including severe flooding, extreme droughts, soaring temperatures, soil erosion, and extended ranges or seasons for pests and diseases. While all FAO projects in Afghanistan include components that indirectly address resiliency to climate change, FAOAF has had only a few projects directly aimed at climate change and natural resource management. This will change as more donors and national governments are now focusing their development funding on projects for climate resiliency.

One of the first FAO projects in country to focus exclusively on natural resource management was the **Strengthened Approach for the Integration of Sustainable Environmental Management (SAISEM) project**[39]. This project, a good example of the ONE UN APPROACH to development work in Afghanistan, was a joint FAO - UNDP - UNEP project. Further it worked at an intra-governmental level, improving integration between MAIL, MRRD, and NEPA. Such intra-governmental coordination is a huge challenge worldwide, but is especially important in Afghanistan as GoIRA continues to reorganize itself based on emerging reconstruction needs.

The project had policy and practical components. On the policy side, it aimed to mainstream environmental issues into national, provincial and district development plans, then develop the capacity and actions necessary to operationalize these plans. The Project directly contributed to the UN Development Assistance Framework outcome on improving the capacity of GoIRA to manage natural resources to support poverty reduction, minimize land disputes, and reduce vulnerability to natural disasters. It also directly responded to the environment and natural resources benchmarks within the Afghanistan National Development Strategy.

SAISEM began by helping NEPA develop National Environmental Mainstreaming Guidelines; these guidelines helped all ministries that had an environmental mandate add natural resource management plans into their development agenda. As a follow-up to the Rio+20 Conference, the project also supported GoIRA as they created a sustainable development strategy, a roadmap for integrating environmental issues into the curriculum of the Afghanistan Institute of Rural development, a comprehensive climate change strategy, and guidelines for Strategic Environment Assessments to be used for the screening projects prior to implementation.

At sub-national level, the project supported the establishment of Provincial Environment Advisory Councils (PEACs). Two PEACs were initially piloted and guidelines were written both for establishing PEACs and helping them integrate environmental issues into sub-national planning processes. Following the pilot, NEPA established PEACs in 18 more provinces using the guidelines. The PEACs coordinate with Provincial Development Councils (PDC) to ensure environmental mainstreaming in local development programmes. The project also established Environmental Subcommittees (ESC) as district and community-level governing bodies: their role is to raise awareness about environmental issues in their communities. A total of 21 ESCs were working on local planning by project end.

Finally, SAISEM notably helped GoIRA develop Afghanistan's first-ever National Rangeland Management Plan and a National Forestry Management plan. These two documents are meant to provide the foundation for effective science-based management of natural resources in Afghanistan.


Resiliency in
the form of creativity,
adaptability, and strength of
people and institutions will be
able to handle whatever changes
their future brings, whether that
be climate change, or any
other number of social
or environmental
challenges.

The practical side of SAISEM helped communities develop and implement projects on sustainable natural resource use, sustainable livelihoods, institutional capacity related to community-based initiatives and natural resources awareness raising.

For example, a large part of the project focused on piloting Community-Based Natural Resources Management (CBNRM) interventions in Herat, Badghis and Ghor. These three provinces have pervasive problems with low living standards, poor nutrition and a lack of access to vegetables. They also have extensive natural resource degradation due to over-harvesting of forests, and over-grazed rangelands. In one subproject designed to address these issues, SAISEM and PAIL staff provided nearly 500 women with vaccinated chicks, simple tools, poultry feed and training on building coops and maintaining healthy backyard chickens. The project also used pistachio growing as a means to provide livelihoods while restoring the land. In Badghis. 756 new pistachio gardens were set up, and farmers were given saplings, tools, and extension services. Greenhouses were also built so that saplings could be grown and more pistachio farms could be established post-project.

In Ghor, fruit orchards were introduced. In addition to providing saplings and training on orchard establishment and maintenance, SAISEM also distributed 16 000 firewood saplings to farmers to plant around their gardens. Similarly, nearly 35 000 firewood saplings were given to pistachio farmers in Badghis. The idea behind donating firewood species to farmers was to replant the land, provide shade for the gardens, and discourage cutting of forests for fuel.

UNEP, UNDP and FAO staff also worked with PAIL and local communities in the same three provinces to rehabilitate 159 hectares of degraded rangeland. When this component began, the project team discovered that the soil was nearly completely devoid of seeds. Therefore, the team collected ten native plant species seeds from the field, planted them, and multiplied seeds at sites in Herat and Ghor, producing 1820 kg of seeds which were then used to replant and restore the rangelands. The communities in all provinces took full ownership of the projects: they came to CBNRM trainings as scheduled, clearly learned the value of natural resource protection and helped in every aspect of landscape planting and restoration.

For all practical project components, community members and MAIL and NEPA staff received intensive training on the skills they needed to implement and maintain their projects and protect and restore natural resources. A policy was adopted of classroom training followed by fieldwork alongside partners. By project end, the local management of natural resources had improved and local communities felt empowered to make their own decisions about the management of their environment. And, the skills of government staff were improved so that they could serve their communities more effectively.

Regular ToT and on-the-job training workshops were conducted for staff of MRRD, NEPA and other relevant national-level ministries. These trainings covered the topics of: environmental integration, climate change, water quality monitoring, environment and gender, environmental conservation, and awareness raising.

This latter topic also produced some of the most innovative practical work of the project. This was through a component focused on awareness building around natural resource management through the use of different mediums, including radio, TV, classroom presentations, community events...and mullahs. Mullahs are influential and trusted religious leaders in Afghan culture and their role in disseminating information to communities is crucial. Recognizing the value of mullahs as propagators of information and inciters of community mobilization, SAISEM staff and GoIRA

The project launched a kitchen gardens intervention to improve food security, reduce poverty, reduce pressure on natural resources, and empower women. Women in the targeted communities were shown how to grow vegetables, and given kits with basic farming tools and vegetable seeds. The team followed up with the beneficiaries a year after the project finished and found that there were 847 kitchen gardens operating, providing fresh vegetables for families, and reducing the harvest of wild plants. Even better, several women who were not part of the initial group of beneficiaries copied the process and established gardens on their own.

counterparts conducted workshops to teach 70 mullahs about environmental topics and encourage them to use their sermons to deliver messages of environmental protection, climate change and landscape restoration.

One of FAO's newest projects focuses specifically on improving community resiliency through community forestry and biomass energy. The project, funded by the Global Environmental Facility is called **Reducing GHGs Through Community Forests and Sustainable Biomass Energy**[40]; it began in 2016 and is currently set to run through 2019. The goal of the project is to remove barriers to climate change mitigation in Afghanistan by promoting improved practices and policies related to forestry and biomass. The project focal areas are Dara-e-Nor, Nangarhar and Salang, Parwan, two areas where there is severe forest degradation, and communities who will benefit from biomass energy.

Afghanistan was once known for its' extensive forests – particularly in the Hindu Kush Mountains, the craggy central mountain range of the country. Today, these forests suffer from widespread environmental degradation and are estimated to have decreased in size 18-fold in the past 100 years. This is because of excessive fuelwood consumption: the current average rate of woodfuel by households using a floorpit or tandoor system for warmth and cooking is estimated to be 10-14 tonnes per household per year. As forests are cut to meet household energy needs, or make more rangelands for the country's extensive animal herds, national GHG emissions rise. Women and children spend excessive amounts of time collecting wood. And perhaps worst of all, this forest loss leads to soil erosion, invasion of non-native species, decreased soil water retention, and poor local climate control.

The Reducing GHGs Project is addressing deforestation through both the demand and supply sides, while improving knowledge about deforestation and biofuels. The project is focusing on climate change mitigation and natural resource management through sustainable, community-based forestry activities. Its' activities align with the new Afghan National Forest Law and the National Forestry Management Plan developed under the SAISEM project.

The overall project strategy is to extend the existing natural resources management capacity of GoIRA and community organizations. Project participants are trained on natural resources management and given technical assistance to design, implement and monitor activities that both reduce GHG emissions and create environmental and socio-economic benefits. The goal

HERAT, BADGHIS AND GHOR ALL HAVE SIGNIFICANT RANGELAND DEGRADATION ISSUES THAT IMPACT FOOD SECURITY AND SELF-RELIANCE. SUSTAINABLE LIVELIHOODS ACTIVITIES, INCLUDING RANGELAND REHABILITATION, WERE NEEDED.

THE **SAISEM** PROJECT:

SAISEM TRAINED MORE THAN **2300** MEMBERS OF CDCS, ENVIRONMENTAL COMMITTEES AND FARMERS ON COMMUNITY BASED NATURAL RESOURCE MANAGEMENT PRINCIPLES.

270 NEPA STAFF WERE TRAINED ON DOING LARGE-SCALE ENVIRONMENTAL AWARENESS CAMPAIGNS USING TV AND RADIO, AS WELL AS NATIONAL, VILLAGE AND SCHOOL EVENTS.

AFTER SAISEM, AFGHANISTAN NOW HAS A **NATIONAL FORESTRY MANAGEMENT PLAN**, WHICH IS A COMPONENT OF THE RURAL DEVELOPMENT STRATEGY FOR 2020.

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Severe floods during normally-dry seasons are becoming more frequent in Afghanistan.

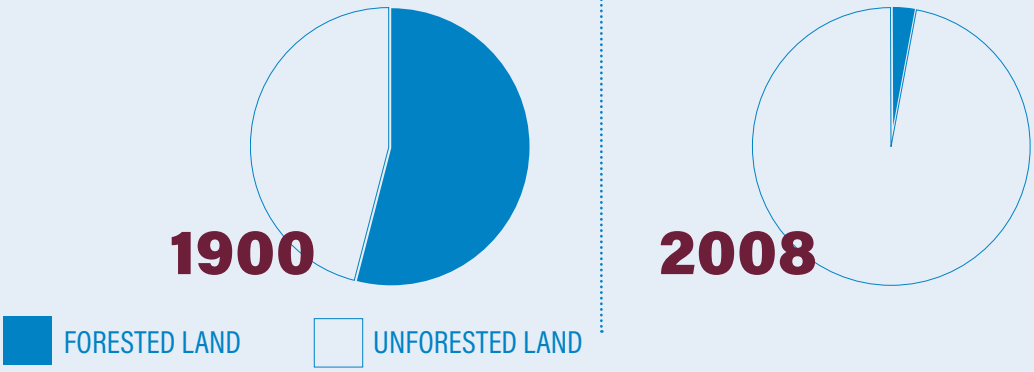
is to establish a foundation for future climate change mitigation activities by training extension officers and community members, and gathering and sharing high-quality data to support calculations of GHG emissions from mitigation activities. The project is integrating its' activities into ongoing work under the National Priority Programmes of MAIL, MRRD, MEW and NEPA.

Communities with already-established committees for community development and forest management associations have been prioritized in order provide technical support as quickly as possible. However, the project is also assisting underserved communities by setting up community organizations so that they can be included in project activities in the coming years. This process is implemented by NGOs with a well-established local presence; this reduces costs, supports national salaries, and builds community trust.

A little over a year into the project, targets in all project areas have been met or surpassed. One of the biggest achievements was sending representatives from MRRD, MEW, NEPA, Kabul University and FAO to a regional training in Bangkok on EX-ACT (EX-Anti Carbon Balance Tool), followed by a training in Kabul for an additional 30 participants. EX-ACT is FAO-developed software that allows users easily to estimate the GHG emissions and sequestration potential of development projects. Following the training, EX-ACT guidelines were prepared in Dari and Pashto, and this tool is now being by the General Directorate of Natural Resources Management of MAIL. Other trainings for government staff have been completed on forest inventorying, carbon measurements, CBNRM, and sustainable biomass energy.

At the local level, 10 forest management associations have been formed and registered. CBNRM plans have been developed by the communities for two of these associations, and a needs assessment workshop was held for the natural resource managers of eleven provinces. Project coordination unit meetings are

THE RESULTS OF A CENTURY OF LAND DISPUTES, CIVIL CONFLICT AND OVERUSE ON AFGHANISTAN'S FORESTS:



regularly held in target districts to ensure good stakeholder coordination and communication.

The project is also promoting sustainable biomass energy systems such as fuel-efficient cookstoves, bukhari heaters and biogas digester's – all in line with Afghanistan's national renewable energy policy. It is purchasing these products from local producers, and then selling them at subsidized prices to families in the project areas. While some families were at first reluctant to spend money on new cooking and heating devices, project staff showed them calculations of the money and time that would be saved in the medium to long term. Convincing them then became a simple task.

Finally, FAO has provided technical support to the government by reviewing documents such as the national Climate Change Strategy, the Afghanistan GHG Inventory Report of 2017, the Afghan Renewable Energy Law and its relevant strategies. Technical project documents have also been produced; these include a training toolkit on CBNRM and sustainable forest management, forest maps for the project areas, methodologies on collecting baseline data for biogas digester installation and a biogas construction manual.

The progress made in the project has buoyed hopes that Afghanistan will be able to preserve its' remaining forests and continue down a path of sustainable development. However, if Afghanistan wants to survive or even excel under climate change, future investment into climate change projects must focus on adapting communities to an already irreversibly changed climate.

IN TOTAL THE **REDUCING GHGS PROJECT** WILL DISTRIBUTE:

1100

CLEAN, EFFICIENT COOKSTOVES

900

ENERGY-EFFICIENT BUKHARIS

3000

TANDOORS

20

SOLAR COOKERS

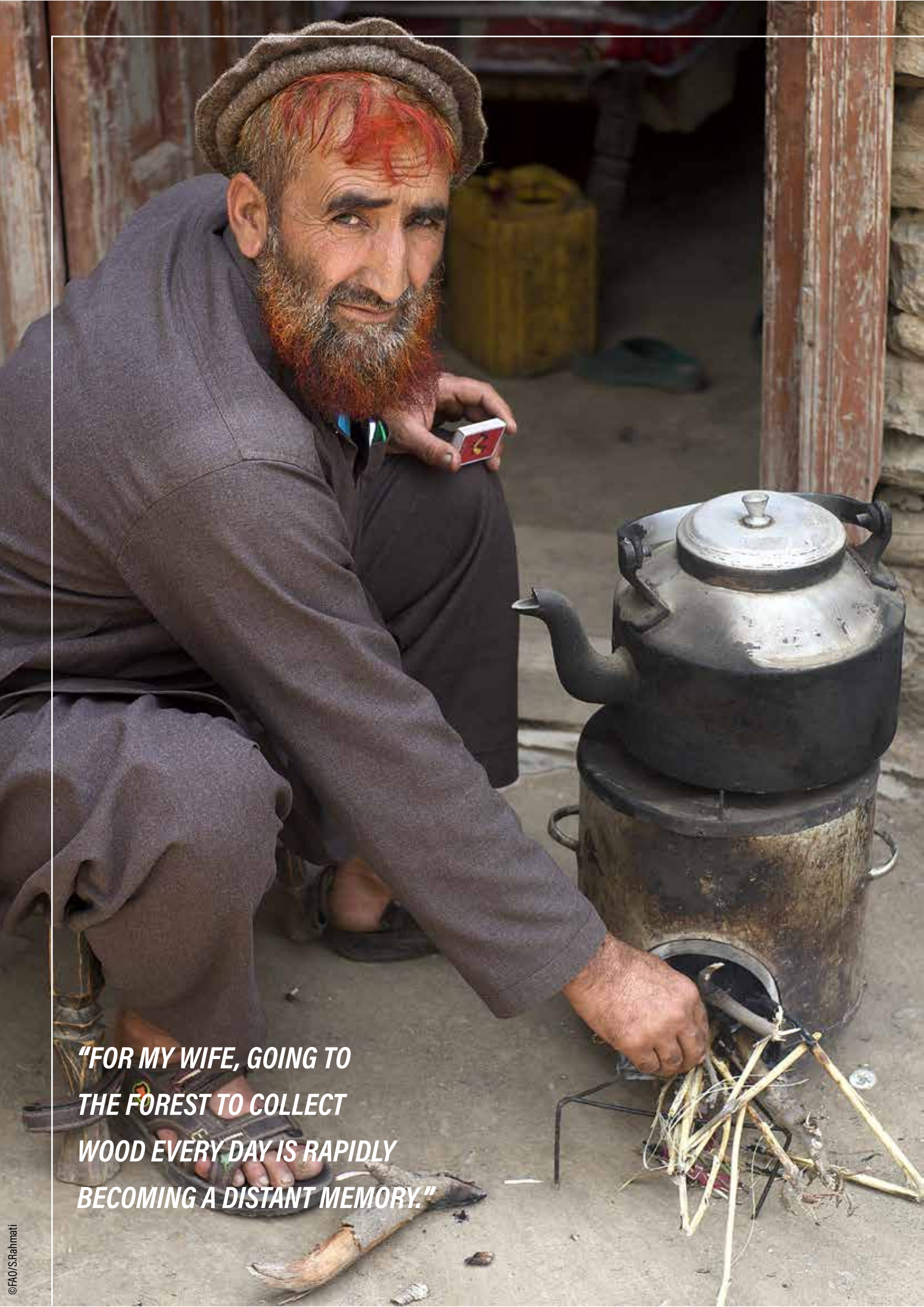
HOPEFULLY SAVING

100's

OF HECTARES OF FORESTS AND

1000's

OF HOURS OF COLLECTING FIREWOOD.



"FOR MY WIFE, GOING TO THE FOREST TO COLLECT WOOD EVERY DAY IS RAPIDLY BECOMING A DISTANT MEMORY."

PROFILES OF SUCCESS: ABDUL MALIK

Collecting wood takes a lot of time, particularly for women, who are the primary collectors. All this time gathering wood is not only exhausting, but it takes away time from producing farm products, caring for children, and leading a healthier life. Realizing this issue was a problem not just for his family, but his whole village, smallholder farmer Abdul Malik and his family got involved in the "Reducing greenhouse gases emissions through community forests and sustainable biogas energy" project when it started in his district in Nangarhar in early 2017.

The wood consumption in his district of Dar-i-Noor was always very high. This was resulting in rapid deforestation, but was also an unproductive use of women's time. In Afghanistan, like in most developing countries, it's the women who are responsible for collecting wood from nearby forests and carrying this heavy burden home, often over distances stretching many kilometers. This task was done each and every day, meaning women were away from home for long stretches of time, and men were left to tend to the home, livestock and children. Many local families felt that wood collection was one of the biggest challenges in their lives, especially as forests shrunk and the distance to carry the wood grew further with each passing week.

After the project started, families like Abdul Malik's signed onto local community agreements that FAO helped them draft. These agreements defined ways in which the community would reduce deforestation through the use of more energy efficient cooking and heating technologies, as well as through participatory land management. The FAO team also visited Abdul Malik's village several times to provide information on the importance of forests and how careful conservation would benefit the community well into the future. They were convinced.

Abdul Mallk says that "Before this project, women like my wife were collecting wood from the forests every single day; since this project has started, the women only need to collect wood once a week, since our stoves use so much less wood. With less time spent collecting wood, and less wood smoke in our homes, the health of everyone, especially women and children has improved. We've also saved money, and it's nice knowing that we've done a good thing for the planet too."

Abdul Malik further notes that for him and his family, "the most surprising part of the project was the fuel-efficient stove they sold us." Abdul Malik had heard about these stoves before, but never really believed that they were any better. "Thanks to the FAO subsidy, we were able to buy a stove and have seen for ourselves how fuel efficient they really are. For my wife, going to the woods everyday is rapidly becoming a distant memory, and now she can help take care of the home and children much more. Which is good, because they like having their mother around!"

With women able to spend more time on household chores, men have more free time to go out and earn income, whether that be on their farms, working on other farms, or finding jobs as laborers and construction workers. For all of the families involved in the project, these time- and fuel-efficient cooking and heating technologies have resulted in larger household incomes. Kids now have school supplies and time to study, sick people have the medicine they need, and women can buy more food and household items.

Now that this project has started, the villagers know what climate change is, and how it impacts their lives, such as through water shortages, too much or too little precipitation causing droughts and floods, and high temperatures in the wrong season. Abdul Malik said he now understands that If we, as a planet, don't stop cutting down trees, then we will have a lot more climate related problems in the coming decades, and life will be that much more difficult for his, and all of our children.

6 FOOD AND NUTRITION SECURITY AND RESILIENCE BUILDING

FAO common interest groups help farmers get their vegetables to market faster.

Hunger doesn't just affect a person's stomach. Hunger and malnutrition, once pervasive in a society, trigger an avalanche of other problems, including mental distress, susceptibility to disease, physical stunting, and ultimately, social and political instability. And unfortunately, worldwide hunger is increasing. A recent FAO/World Food Program (WFP) study reported that global hunger is rising after more than two decades of decline: 777 million went hungry in 2015 to as compared to 815 million in 2016.

Civil conflict is the primary driver of this reversal. Most people suffering from acute hunger live in conflict zones – which accounts for over half the people on the planet. Likewise, almost 75 percent of the world's stunted children live in these countries. As a result, an entire generation is likely to grow up with diminished productive capacity, lower income-earning potential and poor cognitive skills. These factors have chilling implications, and while Afghanistan is not the most food insecure nation, the protracted national conflict may be made worse by continuing food insecurity.

Food security is further threatened by climate change and poor natural resource management. Already much of the land in Afghanistan is degraded due to overuse and conflict. As trees, shrubbery, and natural soil embankments are torn away, the land does not hold water, which leads to erosion of valuable topsoil, vulnerability to climactic shocks, and an inability to produce food. This is not just a future threat to Afghanistan - this is a very real issue in many provinces today.

Food insecurity also results in mass migrations, including IDPs, who place pressure on cities when they migrate to them for seasonal labor. Food insecurity also produces international migrants, who can unintentionally cause increases in tension between regional neighbors. Finally, food insecurity drives farmers to illicit forms of agriculture, such as opium poppy, which grow with less water and lower quality soils, and bring in higher profits than many food crops.

Recognizing that this perfect storm of food insecurity factors is brewing, in 2012, GoIRA released the Afghanistan Food Security and Nutrition Agenda, and MAIL included food security and resilience building as it' 6th strategic priority. Recent estimates suggest that 30 percent of the country is food insecure and that 41 percent of children under the age of five are stunted. Contributing to this insecurity are many factors: high unemployment, slow economic growth slow, limited access to healthcare, and recurring natural disasters. Conflict also worsened the situation, resulting in 750 000 people in high-conflict areas that required food assistance in 2016.

While every strategic priority of the NCADPP and past agricultural sector plans ultimately addresses food security, MAIL recognized a need to make it a separate priority to highlight how critically important this issue is in bringing stability to Afghanistan.

To implement SP6, MAIL will work closely with the Food Security and Nutrition Agenda to coordinate efforts with MAIL extension workers and home economists. Rather than using a project-centered approach to food security and resilience, MAIL is anchoring these ideas into the overarching philosophy of MAIL and PAIL staff. Food security, nutrition and resilience will be emphasized in all community interactions. The approach will be centered around: providing technical support to meet women's needs in the agricultural industry, launching urban and peri-urban agriculture and small-scale agro-based enterprises, and enhancing women's training programmes at the community level, recognizing women's restricted mobility in Afghanistan.

MAIL has also created a unit for planning and implementing the national Emergency Preparedness, Response and Resilience strategy. Disaster readiness and resiliency plays a huge role in preventing sudden outbreaks of hunger. The Ministry will also strengthen weather early-warning systems at its' research stations, is exploring how crop insurance can stabilize food supplies and livelihoods, and is promoting kitchen gardening for increasing food security and resiliency. At the national level, MAIL is adopting an agriculture-specific policy to disaster readiness. At the sub-national level, it is developing a multi-ministerial regional coordination unit to improve disaster preparedness and responsiveness. PAIL staff are also being trained to teach disaster-resilient watershed management to farmers, producer groups and irrigation associations.

Throughout all of these strategies, women will be key players. Women make the primary decisions about how household money is spent, and they are the ones who ensure that healthy food is on the table for their families. In Afghanistan, as is true everywhere in the world, well-educated women make better choices for themselves, their partners, and their children, which have impacts that extend far beyond the walls of their homes.

While, as noted above, the food security situation has worsened in recent years, Afghanistan has struggled with food security for decades. Knowing this, FAO has supported always MAIL with diverse projects focused on food security, livelihoods and nutrition. Most of these projects were designed to improve household food security and nutrition, primarily by increasing the dietary diversity and diversifying household incomes. They addressed the high incidence of poverty and food insecurity, particularly insecurity experienced by women, given their restricted access to agricultural resources, knowledge and economic opportunities.

The first large project focused on largely food security and resilience was the **Development of Sustainable Agricultural Livelihoods in Eastern Hazarajat (SALEH)**[41] project. SALEH worked exclusively with the Hazaras, the Shia ethnic group in Afghanistan, who comprise about 17 percent of the population[42]. While widely dispersed in the country, their heartland is in the broad area known as Hazarajat, in central Afghanistan. Generally, the people and their surrounding cultivated land are situated at 2 000 to 3 200 metres above sea level; their summer grazing lands are even higher, extending to over 4 000 metres.

The people of the Hazarajat suffer from high degrees of food insecurity and many people are malnourished, not only during the winter lean season, but also in spring and early summer before the harvest. Most farmers are smallholders, and their crops are typically big enough to feed their families from a minimum of two to a maximum of nine months per year. The SALEH project was active from 2003 to 2009, and was designed to address these chronic food insecurity issues, as well as to try to slow the tide of poppy growing that was ebbing into these highland regions. The geographical focus was limited to four highland districts of Bamyan province: Shibar, Yakolang, Panjab and Waras.

The SALEH project goal was to improve the livelihoods of the people of Eastern Hazarajat by developing the capacity needed to achieve food security and generate income; this was done through small improvements in management of crops, such as wheat, potatoes, pulses, fruit and nuts and better livestock husbandry, through improving natural resource management, and by developing literacy and teaching programs so that the community could support their own future development. Above all, local involvement and ownership of the reconstruction process was a guiding tenet of the project.

To achieve these ends, the project first strengthened the self-reliance of Hazarajat communities by helping them identify and resolve problems themselves; it did this in part through establishing farmer-based organizations (FBOs) and helping these organizations network with local NGOs that could support them in times of need. NGOs and DAIL staff then technically trained the FBOs, as well as guided infrastructure development, helped them access markets, and procured farming inputs for them.

The FBOs and NGOs also facilitated as the communities analyses their own strengths and weaknesses and designed solutions to environmental, food and agricultural challenges. In total , the SALEH project created 68 FBOs and provided training in improved agriculture practices, natural resource management, and monitoring and evaluation. The FBOs were monitored by project community liaison officers who were involved with community development and agricultural extension work, including the formation and training of community-based monitoring and evaluation teams, another project innovation that taught the community to take charge of their own development.

While the FBOs were essential in ensuring community involvement and ownership of the project, technical activities were the true core of the project. Interventions included resilience measures like improved pasture management and rehabilitated irrigation infrastructure, and food security measures like better farming systems, on-farm diversification, and improved women's educational opportunities; all interventions were based on the subsistence farming modality of the region, and all led to improvements in household diet and food security, cash incomes, farm labour, natural resource use and farm diversification.

All project activities were designed after a careful analysis of farming systems in the area. For example, legume crops were almost non-existent in project areas, despite favourable climatic conditions for their cultivation. As such, chick peas were introduced. Another crop the project worked with was potato, which is the main crop in Bamyan, covering about 70 percent of the cultivated land. Varieties were planted that were known to thrive in the cold conditions of Bamyan, potato storage facilities were built, a standard design package for constructing more facilities was produced, and farmers were trained on producing clean potato seed that could be sold nationwide.

The HFLS projects were successful in providing MAIL with a model for decentralized and demand-driven agriculture extension services. The adoption of this model became a key government priority and was scaled up nationally as part of the NCADPP.

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Previous to the SALEH project, vegetable cultivation was almost non-existent in Bamyan because of the difficulties in producing seedlings in the cold temperatures at high altitudes. However, vegetables provide a nutritious alternative to potato, and also can fetch high market prices in the off-season nationwide. To overcome the temperature constraints, the project supported farmers as they built low plastic tunnels for seedling production. The main vegetables promoted by the project were cabbage, cauliflower, eggplant, carrot, radish, cucumber and tomato.

The SALEH project also established fruit tree nurseries, which not only benefited nursery owners, but also provided saplings to more than 1 000 farmers to create orchards. The project trained farmers in nursery establishment and management, as well as in the scientific basis of orchard establishment. Nursery owners were introduced to intercropping, especially that of legume crops with fruit trees, and were supported to establish orchards on a cost-sharing basis. Towards the end of the project, several private nurseries and orchards were set up in the project areas through the initiative of farmers, indicating project self-sustainability.

Other food security and resilience components were on beekeeping and poultry raising. To support these, FAO distributed beehives, trained women in honey quality control and marketing, and formalized two women's beekeeping associations. Other women were trained in poultry raising and marketing, resulting in 16 poultry growers' groups in Bamyan, which regularly collect and sell eggs in local markets. These interventions increased family food security, and substantially increased the income of more than 2500 families.

Finally, the project introduced a number of resilience-building activities. The first was community-based pasture management. In Bamyan, over 90 percent of the land is pasture, but it was largely degraded due to overuse driven by poor ecological management, and community conflict. Sustainable pasture management is a key concern in Bamyan, because it is used for both fuel and fodder, and provides essential protection to rural communities during the winter. The project, together with the FBOs, NGOs and DAIL, introduced community-based pasture management plans based on conflict resolution, customary land rights recognition collective property norms development, the conservation of threatened resources, community-based regulation and management, and community empower and self-reliance. Pasture lands are now divided into three categories: private pasture, community pasture and public pasture, which has

addressed both ownership and management issues, and resolved many of the past conflicts. Further, based on lessons learned from the Project, MAIL started community-based pasture management initiatives nationwide, and has expanded the approach so it can include more complex issues, such as how to manage seasonal access by Kuchi nomads.

To build upon this new approach towards land management, the project also introduced hybrid poplars to local communities. Poplar trees are widely used for construction purposes and fuel. Hybrid varieties grow much faster than local varieties and became very popular among the local communities. Five varieties were found to be suitable to the area and, by the end of the project, 40 wood lots, with more than 120 000 saplings, had been established.

The final resilience-building activity was infrastructure development. Irrigation rehabilitation and construction activities were identified as a key priority by all communities during the early stages of the project. So, in order to ensure all of the livelihood and food security interventions that the project implemented would be sustainable, a reliable source of water was needed. To this end, the project constructed 16 irrigation structures, ensuring an adequate and reliable water supply to more than 600 ha, and serving 600 families. This was helpful, though not enough; FAO continues to work to ensure that its' larger irrigation projects can address needs identified in smaller project areas.

Another set of projects focused exclusively on food and livelihood security are the **Household Food and Livelihood Security (HFLS) projects**[43], implemented in three phases since 2010 and continuing today. The guiding tenets behind these projects were and are extreme poverty alleviation by 1) providing small-scale farmers with improved and diversified farming systems or alternative livelihoods, 2) organizing farmers so that they understood their own needs and capabilities and could become self-reliant, and 3) building the national extension services so that they could be more responsive to farmer needs.

The HFLS projects have been focusing on four provinces: Kabul, Nangarhar, Balkh and Bamyan. Each of these provinces are secure enough to work in, and have large poor rural populations which could benefit substantially from small-scale food security and nutrition interventions.

Like many other FAO projects, the HFLS projects set up CIGs among various types of farmers and producers. In the earlier years of the HFLS projects, MAIL and PAIL

RESULTS FROM THE **SALEH PROJECT**:

USD 100 WAS ADDED TO THE MONTHLY INCOME OF MORE THAN 2,500 FAMILIES THROUGH THE SALE OF EGGS OR HONEY

12 000 FARMING FAMILIES WERE COVERED BY THE PROJECT

25% INCREASE IN THE MAJOR CROPS OF WHEAT AND POTATO

25% MORE FUEL AND FODDER IN PLACES WHERE COMMUNITY-BASED PASTURE MANAGEMENT (CBPM) WAS USED

19 FRUIT TREE NURSERIES WERE STARTED, CONTAINING ABOUT 60,000 FRUIT AND NUT TREES

3000+ FEMALE FARMERS WERE TRAINED IN POULTRY RAISING AND MARKETING.

©FAO/G.Napolitano

extension agents, and through them, CIGs, were trained in how to assess seed and fertilizer, how to prepare fertilizers and natural insecticides, how to manage revolving funds, and how to improve value chains. They were also given gender awareness and other social, technical and managerial trainings that would lead to better CIG management and better livelihoods for all farmers involved in the projects. Female farmers (and extension staff) were targeted as much as, if not more than, male farmers, as they were the ones who tended to lack paid occupation, and are the ones who typically are in charge of managing family finances.

All phases of the HFLS projects, and most especially the current phase, began with large-scale surveys of the target districts. These surveys were absolutely essential in establishing local abilities and needs, as well as providing MAIL with badly-needed data on the state of agriculture in the country. Such data allows for better-informed decision-making, and ultimately smarter decisions on agricultural and rural development. Additionally, during the survey process, MAIL, PAIL and MRRD staff were trained in proper survey methodology, improving the technical ability of MAIL to do such work independently in the future.

One of the main challenges identified in the surveys was that people in the target districts had few financial or physical assets, which made it hard for them to break out of the cycle of poverty. The revolving funds address this by pooling profits and reinvesting them for the good of the community. Second, small land holdings by individual families were identified as a secondary problem. This prohibited many families from growing wheat or other large-scale crops that tend to bring in money to Afghan farmers. However, even with small land holdings, profitable farming activities exist. So, similar to the SALEH project, the HFLS project introduced producers to various small-scale or boutique farming and producing activities.

In the current HFLS project, one of these small-scale producing activities is a school lunch program that is being implemented cooperatively with MAIL and the Ministry of Education. This activity is focused on two boys and girls public schools in Bamyan. Each day, a CIG of 11 women and one man buy vegetables from their neighbors or the local bazaar, and then bring them to the school to prepare, cook and serve using hygienic cooking techniques. FAO and MAIL nutrition experts designed a balanced, alternating menu and taught the CIG how to judge food quality, calculate necessary provisions, prepare, cook and serve the food. Height and weight measurements were taken of all the children previous to project commencement, and

when the project ends, their weights and heights will be compared to those of children from neighboring schools not in the program. Many of the children in this area are known to suffer from malnutrition, so it is hoped that this lunch program will have a positive physical and mental impact on the kids being fed, encouraging upscaling of the program by the Government.

Another especially successful endeavor have been the mushroom growing subproject. This subproject was introduced in the second phase of the HFLS projects. In it, 99 female trainees were organized into five groups, trained on spawn production and mushroom cultivation, and shown how to package, market and sell on the local market. Years later mushroom growing is still being sustained by some of the groups, who are selling their products on the local markets and Ag Fairs.

The mushroom growing subcomponent was also an inspiring story of intergovernmental and United Nations cooperation. In order to identify, train and procure inputs for the mushrooms farmers, MAIL, MRRD, WFP, FAO, and local civil society organizations and NGOs all had to build and maintain successful working relationships. For example, while FAO managed the overall project, WFP was instrumental in delivering inputs to the female farmers, and both organizations played roles in training MRRD and MAIL staff and extension agents in the technical aspects of mushroom cultivation, so that these staff can help the local communities sustain mushroom production beyond the life of the project. A similar of partnership happened between the above groups in order to train and source kitchen gardens for over 800 female beneficiaries.

The HFLS project is therefore another great example of the ONE UN APPROACH that the UN has taken in order to help Afghanistan build back faster and better.

THE COMBINED **HFLS PROJECTS** DISTRIBUTED:

3.57 MT
COTTON SEED

12.72 MT
VEGETABLE SEED

79.6 MT
WHEAT SEED

4500
PULLETS TO 300 HOUSEHOLDS

800
APPLE SAPLINGS

145 500
VEGETABLE SEEDLINGS

The government wants to turn this into a nationwide project. In the first and second phases it started 563 CIGs, and the revolving funds recovered a total of AFN 30 953 220, which was 80 percent of the original costs of the inputs - after just one season!

“I ALSO OWN A WOMEN'S CLOTHING STORE, BUT SCHOOL LUNCHES ARE IMPORTANT TO ME BECAUSE THEY IMPROVE OUR WHOLE COMMUNITY.”

After hearing Zahra's story, it is a wonder that Zahra ever has time to sleep.

At age 35, Zahra has five children, runs two businesses, is part of a women's cooperative, and works on the FAO school lunch program that is part of the larger HFLS project. Her husband runs a small farm outside Bamyan Center, and together they are a sort of power couple for this tiny, near rural city. But, while her life is comfortable now, it was not always this way.

Zahra is originally from a small village in Bamyan, which is also known as the Hazarajat, or the center of the Hazara ethnic group. The Hazaras are one ethnic minority in the country, and almost all are Shia Muslims. When Zahra was 13, the Taliban came to power in Afghanistan, and while strict with everyone, the Taliban were particularly unfond of this Shia minority.

Starting around 1999, the Taliban began to wreak havoc on the Hazarajat, famously destroying two giant, well-preserved 6th century Buddhas in 2001. But, their destruction didn't begin or end there. They also terrorized the citizens of the Hazarajat. Most people, including all of the 11 women and one man in Zahra's school lunch group, left their homes because according to them "everyone who didn't leave was killed."

After seeing her cousin get shot in front of her, Zahra, her two sisters and her mother walked, and walked, and walked...for three days, until they reached Ghazni province where they were able to shelter and blend in with the Hazara there. In Ghazni they found various ways to support themselves while their father stayed behind and fought the Taliban. One of the ways they supported themselves was through teenage Zahra working under her burqa as a health care provider in a village clinic, despite women being largely forbidden from working.

After the Taliban were ousted from power in 2001, Zahra returned to Bamyan. Restrictions against girls going to school were lifted, so at 18 she started high school, and determined to rebuild her family and community, successfully finished.

Shortly after high school she married, and started having children. Her husband has always been supportive of her working, so she began getting involved in community development projects whenever she could. Through this work in community development, she learned how to build businesses, manage finances, and mobilize and empower other motivated women like herself.

Zahra already had her hands full being part of a women's cooperative and owning two women's clothing handicraft stores in the Bamyan Center Bazaar, but when she heard FAO was looking for people to help implement its school lunch program, she eagerly signed up. Though she knew a lot about clothing and managing businesses, she wanted an opportunity to learn more about nutrition and meal planning, so she could better take care of her children, and help her neighbors do the same.

Now, six days a week during the school year, Zahra and the team of 12 lunch providers buy, cook and prepare lunch for two public boys and girls schools in town. The day begins when they collect vegetables from their home gardens and the local market early in the morning. They then bring the ingredients to the school, and using hygienic techniques and balanced menus provided to them by FAO, cook different stews for the 150+ children that go to these schools. Midway through the school day, they serve the children generous, steaming bowls of stew and freshly-made bread.

With even less free time, but more money than before, Zahra is able to employ a female helper to take care of her youngest children. Zahra says that she's "taught her helper hygienic and nutritious cooking techniques so I know my kids are being fed well now too."

And, she adds, her neighbors come to her all the time for nutrition and hygiene advice, so "the best part of being part of this project is that I'm able to train other women in my community, which hopefully will help more of them find jobs in the food industry and make my community strong again."

Given where Zahra came from, and where she is at a still young age, she is a true inspiration not just for the women of Afghanistan, but for anyone, anywhere in the world.

7 INSTITUTIONAL RESILIENCE BUILDING

FAO trained over 3000 government staff over the past 15 years.

The development world has changed its' focus over the past several decades. Back in the early days of international development, the focus was on emergency response, building physical infrastructure, and cash transfers to achieve specific aims. Today, development focuses more on building the capacity of local institutions and individuals so that, eventually, donor organizations won't need to be in country anymore. The goal is to have capable populations, using their own resources, creating their own futures.

In rural areas development has tended to focus on using cheap rural labor, lax regulations and abundant natural resources to develop local economies through business development. However, in an ever more resource-scarce world, and in a country like Afghanistan with a large and growing rural economy, this sort of development is not feasible. Growth has to be done in a sustainable manner that prevents further environmental damage, can withstand climate change, and promotes internal peace and cohesion. This cannot be done without the full support of the host country, and must ultimately be a self-led process.

With the final NCADPP strategic priority, SP7, MAIL has envisioned a fundamental change in its structure and a turn towards institutional resilience building. This change would focus on building capacity in MAIL and the PAILS to directly support agricultural producers, and to transfer some of those responsibilities to the private sector. This would result in a largely decentralized agricultural system. Given the difficulties of moving and communicating in an unstable political environment that crosses rough terrain, such an approach is not only in line with worldwide development trajectories, it's just plain sensible.

MAIL is in the process of working with the private sector to deliver incentive-based public services. Progress in this has already been evident in the dairy sector, where provincial milk and feed processing centers are now turning profits and functioning without external support. The same can be said of the seed sector, which now has independently functioning seed companies, set up with past support from FAO. This sort of progress is needed across all agricultural sectors. To achieve that, MAIL will continue to look for private sector opportunities in all of its' programs, but, the private sector also needs to take a leading role in research, dissemination, and technology development to support agriculture and land management.

Putting the power of agriculture into the hands of farmers is also a centerpiece of SP7. The CIGs and FBOs discussed in the previous chapters are playing key roles in bringing more autonomy to farmers nationwide. MAIL has also been restructuring its headquarters, and re-examining management positions. Knowledge is being transferred out to provincial staff, who are being entrusted with doing much of the project implementation and monitoring. PAIL staff are also skilled at building good relationships within communities, and can operate safely in places where national government or FAO staff could not safely go. These changes will ideally lead to a more agile and responsive institution with the highest-quality professionals and best services.

MAIL will also provide training to new staff so that they are better able to bridge the gap between farmers and service providers. This will be done in partly collaboration with the Ministry of Higher Education, who will help improve the curricula for agriculture schools. Development partners are also working with MAIL to strengthen existing research programs, create new scientific centres, and develop new linkages between academia, the government, and the private sector in order to stimulate agricultural innovation.

PAIL's are also undergoing significant changes in their management structures and technical profiles, and Farmer Resource Centers, are being renamed as Integrated Agricultural Service Centers (IASCs). IASCs will be established where they do not already exist so that local farmers and herders can have frequent interactions with extension experts. In this new system, PAIL's will provide technical information to the IASCs, IASCs will train district extension officers, and the extension officers will directly assist farmers through demonstrations, training, and other modern agricultural techniques. The PAIL's will not replicate MAIL at the provincial level, but will instead coordinate information and disseminate it to the national level. This way PAIL's can ensure the national agricultural system remains coordinated whenever necessary.

As the institutional capacity of GoIRA continues to improve, and transfers its' knowledge to research and academic centres, and farmers themselves, Afghanistan will have a strong and growing agricultural sector. This sector will not only be resilient in the face of political or environmental changes, but can be one ingredient in the glue that holds Afghanistan together no matter what the future may bring.

FAO ACHIEVEMENTS IN INSTITUTIONAL RESILIENCE BUILDING

The goal of any development project or agency is to eventually obviate the need for development in the host country. This unfortunately takes time, and depending on the context of the country, that time may be quite significant. Most developing nations have a wide array of challenges that impede development, and there are no quick solutions to rapid but ecologically friendly and sustainable development. However, across all developing country contexts, one theme always emerges: that is by building up national human and institutional capacity, the country will more quickly be able to solve their own challenges, lessening the need for donor assistance across all sectors.

FAO recognizes that this development wisdom applies to the agricultural field as well: building a cadre of farmers and processors, rehabilitating the environment, and intelligently managing land and water will not be sustainable without a trained agricultural workforce in the private sector, academia and the government. For this reason, FAO works very closely with government and academic counterparts to ensure they have the training they need to manage, innovate and lead in their country. In order to ensure a close alliance with GoIRA counterparts, FAO Afghanistan is embedded within the MAIL and MEW campuses and directorates, and works closely with government counterparts daily. The end goal of FAOAF is to lessen its' need to be in-country because GoIRA is able to manage its' ecological and agricultural resources and assure domestic food security with minimal donor support.

It is for this reason that every project described above has not only worked closely with Ministry staff to implement projects, but they have all also had significant institutional capacity components. For example, the irrigation projects discussed in the first chapter were co-implemented with a project that was specifically focused on developing MAIL Irrigation Directorate capacity to rehabilitate and manage irrigation systems. The Seed Projects trained MAIL scientists in improved research methodology. The same goes for all other FAO projects.

However, FAO has also had a number of projects that exclusively focus on institutional resilience building, through providing government staff training, supporting improved academic and government research, and putting systems in place that will help institutions both collect and manage data. This last factor is especially important, as good data on agricultural production and processing is essential as the basis for agricultural and rural development planning, for planning appropriate interventions, and for creating smart policies. Developed economies worldwide have agricultural statistics agencies within their national agricultural departments, and Afghanistan, as a country that derives nearly one third of its' economy from the agriculture sector, should be no different.

That's why FAO implemented a series of projects from 2004 to 2013 on **Strengthening the Food, Agriculture and Animal Husbandry (FAAHM) Information Management and Policy Unit/ Agricultural Statistics Services**[44]. These FAAHM Projects grew out of earlier FAO projects which set up the FAAHM unit in the previous Ministry of Agriculture. The ultimate goal of these Projects was to help GoIRA, through several ministries, collect and disseminate good data on agriculture to support better data-based decision-making in the sector. The proximate goal was to improve MAIL (and it's predecessors') expertise by creating new directorates to collect market data, perform economic analyses and house a nationwide agricultural statistics service. The Projects also trained MEW and MRRD staff on surveying, data processing and data-driven policy creation.

However, in order to use data, one needs data, and high-quality agricultural data had not been systematically collected in Afghanistan in decades. Therefore, the first task of the Project was to conduct household surveys across six provinces to collect data for bi-monthly agricultural prospects reports (APRs). APRs are standard tools produced by national agricultural agencies worldwide to provide data for producers and buyers on production rates, weather conditions, production areas, and commodity prices.

This first phase of the FAAHM projects also provided provincial staff with computers and radios so they could collect, store and quickly report data, and it gave them on-the-job training in data collection, survey methodology and reporting. The Project helped the Ministry establish focal points for food security monitoring in all provinces, and it brought in technical experts to help staff write papers, including a chapter on food security for the Agriculture Master Plan.

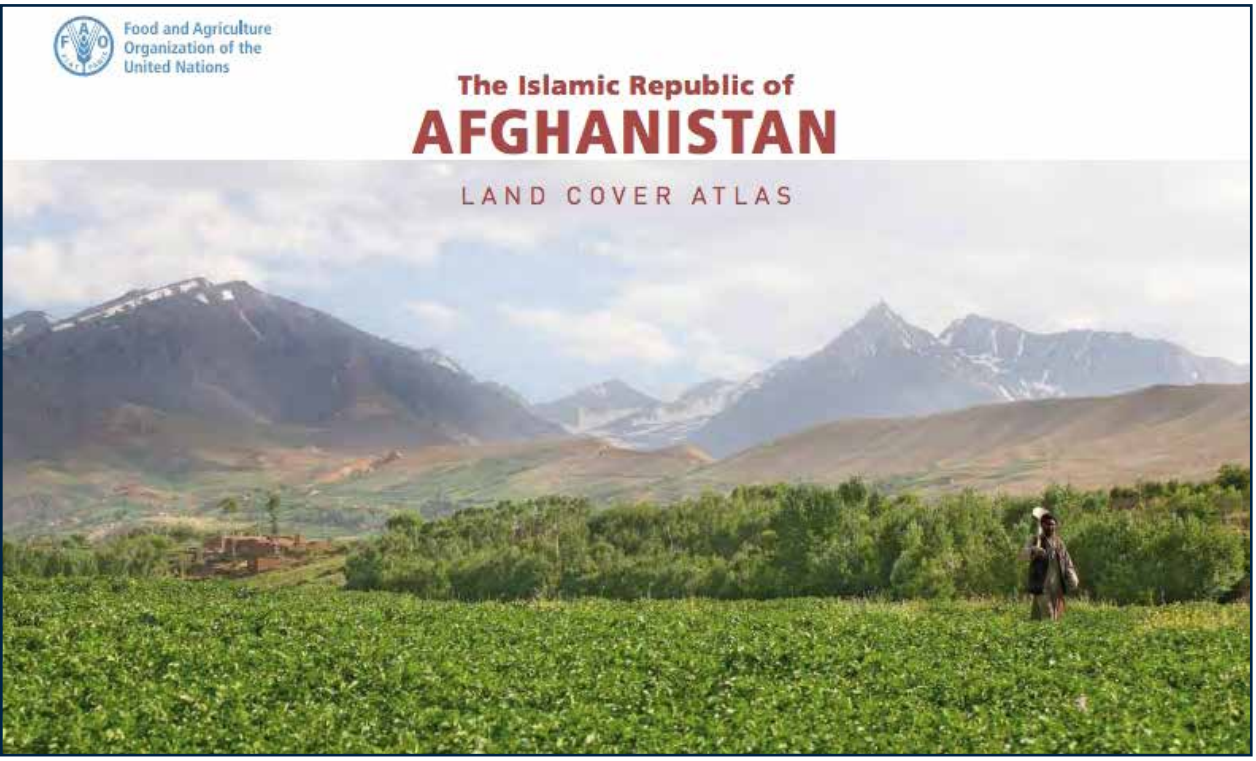
The second phase of the FAAHM projects further built MAIL and Central Statistics Organization (CSO) staff ability to collect, process and analyze data. The Project helped the agencies come up with a long-term strategy for strengthening agricultural statistics, as well as assisted them as they continued to produce APRs. The APRs were expanded under this second phase to include daily, weekly and monthly reports on a large

Now,

MAIL staff from all 34 provinces provide reliable daily, weekly and monthly commodity prices, and wholesale and retail price data on a via radios, mobile phones and internet to the Ministry of Agriculture, Irrigation and Livestock in Kabul. Commodities covered include everything from wheat and mutton to agricultural labour and petrol, to sweet cherries and garlic.

variety of commodities. And, on-the-job training on computer use, data collection and report writing was again given to dozens of MAIL staff, and formal courses in country and abroad were given to both national and regional staff. By project end, MAIL felt their ability to collect and use data was greatly improved, and both MAIL and CSO identified the need for an agriculture census to be conducted alongside a population census as a major near-term priority.

trained staff to more effectively cater to the needs of farmers. To do this, FAO technical experts implemented training and professional mentoring programmes for the General Directorate of Planning and Coordination, which is the main policy-making body of MAIL. This Directorate requested that the project take a hands-on approach by participating alongside national staff in planning and policy development exercises.



The Afghanistan: Land Cover Atlas, produced by FAO.

In the third phase of the FAAHM projects, FAO helped MAIL conduct the first-ever Afghan farm management survey. The main objective was to understand land use patterns, pasture conditions, irrigation sources, and a host of other factors that could help determine the constraints on and potentials for improving farm productivity in Afghanistan. The planning process for the survey was designed to enable enumerators, supervisors and staff to learn by doing. The data was collected using international standards, and the MAIL staff who processed the data were trained in data preparation, variable listing, coding and data entry. One of the most important results of the process were results that suggested that households' access to farmers' organizations, training, and credit all positively contributed to increasing farm productivity. Such data has since been used by both MAIL and FAO to design more responsive projects.

The Project also created linkages between parts of MAIL, improved their working relationships, and

Thanks to earlier phases of the project, producing APRs has also now become a regular activity in MAIL. These reports are now more complete and the contents of price bulletins have become more analytical. MAIL also now sends weekly retail food price data to the price monitoring team at the FAO Regional Office in Bangkok, who use it to create monthly Commodity Price Bulletins. These bulletins are the main source of regional information on agricultural commodity prices. The bulletins are not only testament to MAIL's improved ability to collect and report on price data, but they also enable Afghanistan to engage in international markets.

Market analyses are another important component of a national agricultural sector. The Project assessed how MAIL staff was able to conduct market studies and designed a programme to train them in agricultural marketing and rapid marketing studies. These trainings focused on price observation and analysis, and how to calculate market margins, gross margins and crop returns. Training materials in English and Dari were

prepared, and commodity-specific marketing and value chain studies were carried out for major fruit and vegetable crops. Staff are now able to keep an up-to-date market information system within MAIL that provides information for farmers and entrepreneurs about recent price and market trends. Such information helps the agriculture industry to adjust their production and processing according to market demands.

The third phase of the FAAHM projects also supported the preparation of the National Comprehensive Agriculture Production and Market Development Programme, commonly referred to as National Priority Programme 2. FAO also worked with the UN Country Team to prepare the midterm review of Afghanistan's 2010-2013 UN Development Assistance Framework, and to lay the groundwork for the Common Country Assessment, in preparation for the next Development Assistance Framework. To assist with future planning, a comprehensive policy and planning manual was prepared for MAIL. And, FAO helped establish the Policy Analysis and Legal Affairs Department at MAIL and developed guidelines for its operation.

Finally, the crowning achievement of these projects was the creation of a new land cover atlas for Afghanistan. Previous to the Project, a 1990-93 land cover dataset, comprised of land cover maps, satellite imagery and land cover statistics, had been the only dataset for natural resources planning and management in Afghanistan. However, considerable changes had occurred since 1993, and updated land cover maps were badly needed. Such maps help policymakers make decisions about where to implement agricultural projects, they help land managers make informed decisions about land use, and they help the local communities understand and use their assets.

Mapping was performed by international teams in close collaboration with MAIL and MEW. Two comprehensive training programmes were conducted for government staff, and a state-of-art remote sensing and Geographic Information System laboratory was established in Kabul. The first training programme, at FAO Rome, presented a practical overview of how to create a modern, high-quality land cover database. National trainees from MAIL, MEW and FAO attended the course. A second image interpretation workshop was conducted in Tehran for four national participants. Follow-up trainings in Kabul provided a general overview of FAO methodologies and tools for developing land cover databases.

Producing land cover databases is a technically complex and multi-faceted process. Aerial photographs need to be taken, corrected and processed into mosaics to create a finalized land cover map that matches on-the-ground data. Despite the complexities, MEW, MAIL and FAO completed the map successfully, giving land planners in Afghanistan a data-rich tool for planning. And, this new map, unlike previous ones, is at a scale of approximately 1:50 000, five times the resolution of the previous maps. This map can define vineyards, irrigated agriculture, and other agricultural boundaries which are extremely useful to producers and policymakers. The mapping project was completed with great praise from both the Minister of Agriculture and the President, both of whom had requested the project.

RESULTS OF THE **FAAHM PROJECTS**:

THE FIRST-EVER AFGHAN FARM SURVEY WAS DONE, GATHERING DATA ON MORE THAN **42 000 FARMERS AND PRODUCERS IN SEVEN PROVINCES**.

PROVINCIAL STAFF WERE PROVIDED WITH COMPUTERS AND RADIOS, SO THEY COULD **COLLECT, STORE AND QUICKLY REPORT DATA**.

MAIL STAFF WERE TRAINED TO COLLECT DATA FOR **AGRICULTURAL PROSPECTS REPORTS**, PROVIDING ACCURATE DATA FOR PRODUCERS AND SELLERS.

AN UPDATED **LAND COVER ATLAS** WAS PRODUCED IN 2016, GIVING THE COUNTRY ACCURATE LAND COVER DATA FOR THE FIRST TIME IN OVER 20 YEARS.

The hard cover version of the atlas comes with a disk loaded with the full digital dataset. An online version of the Atlas is available at *http://www.fao.org/geospatial/resources/detail/en/c/1024570/*; this site also includes information about ongoing mapping activities and new products for understanding and using land cover data in Afghanistan.

Building institutional capacity is not just about staff training and education, but it's also about building the capacity for data-driven institutions to be able to generate, manage and use their own data. Achieving this sort of institutional self-sufficiency was the basis for the ongoing **Afghanistan Soil Information System (AfSIS) project**[45].

Healthy soil is the basis for healthy agriculture. Afghanistan's soils have been under intensive pressure as a result intensive agricultural production, low input of organic fertilizers, and highly variable climatic conditions, all of which cause soil degradation. Soil erosion is the most prominent type of degradation nationwide. In the central highlands, frequent floods lead to huge quantities of runoff water that wipes the fertile surface layer of soil from the mountains and washes it onto the fertile soil of the lower plains, leaving them covered with a layer of sterile, carbon-poor sediment. In the south, the hot and dry climate causes intensive drying of the soil, resulting in soil salinization and alkalization. Poor land use practices also have a huge impact on soil quality. Heavy use of mineral fertilizers and pesticides, contamination of soils with excess nutrients and chemicals, and improper cultivation, especially on sloped areas, also contribute to runoff and generally unhealthy soil.

In the past, soil surveys in Afghanistan were conducted as isolated, short term field surveys. A systematic and long-term survey of Afghanistan soils has never been conducted, yet is crucial for smart management and protection of soils. This data furhter must be organised into an easily-accesible database. Previous field soil surveys were done at the local level, as isolated and ad-hoc actions for different purposes; they produced incoherent soil data collected without a systematic approach and standardised soil survey methods. The first survey was conducted in 1946, and since then, development and implementation of MAIL policies have relied upon a large-scale soil map that was prepared in disjointed phases over the past 60 years. Therefore, there is very limited data on Afghanistan soils.

Developing a Soil Information System with accurate and up-to-date soil information had therefore been identified as a high priority for Afghanistan. The need

for sustainable soil management in Afghanistan is incorporated in several national strategies, frameworks and policy documents adopted over the last fifteen years, including the 2006 London Conference on Afghanistan, the 2008 Afghanistan National Development Strategy, and the 2009 National Agriculture Development Framework, among others.

Therefore in 2016, FAO initiated the AfSIS project, through MAIL, and in partnership with five national universities. AfSIS, once completed, will support work across agriculture, improving food security, climate change adaptation, ecosystem services, water management and crop planning, all on regional or watershed-level scales. AfSIS will contain data relating to the spatial variability of soil types and soil properties integrated with natural co-variables like climate, vegetation, geology, relief conditions, hydrology and hydrography. It will also allow the integration of soil information into non-soil data collected through various monitoring campaigns and investigations of other natural resources. Once in place, it can be easily upgraded and extended with new information from the field, and can serve as a reference center for storing soil data for all future soil surveys.

While the project is still months away from completion, nearly all of the goals have been met. Most importantly, an AfSIS database has been developed, and legacy soil information has been incorporated into the database along with new soil data that was collected and analyzed during an intensive, modern soil survey of nine provinces. A soil catalog and atlas of the soil in these nine provinces will be developed prior to project completion, and soil survey and laboratory analysis applications have been developed and are available online.

A soil database and AfSiS website are currently under development and will be fully integrated with all of the soil labs throughout the country, allowing for soil scientists nationwide to easily and quickly share their data into this central database. By the time of project completion, this will be available online as a geodatabase for the public to use. All documents and data integrated in the system will be able to be viewed, statistically processed, downloaded as reports or in a format for GIS processing. These data can be used by MAIL, the private sector and others for identifying and quantifying land degradation, developing better soil conservation practices, designing smart policies in rural and agricultural development, planning for the sustainable management of natural resources, and developing agricultural zoning plans according to the most suitable soil types for crops. AfSIS will likely be expanded nationwide to all 34 provinces after FAO support has ended. MAIL and university staff are now trained to expand it on their own, and their enthusiasm for it in its' early stages suggests that they view it as an essential need for Afghanistan.

THROUGH **AFSIS**:

33 STAFF

FROM MAIL AND NATIONAL UNIVERSITIES HAVE BEEN TRAINED IN MODERN SOIL SAMPLING, LABORATORY, AND DATA TECHNIQUES

8 LABORATORIES

BELONGING TO MAIL AND NATIONAL UNIVERSITIES HAVE BEEN EQUIPPED WITH HIGH-TECH SOIL ANALYSIS TOOLS

2 000 000 HECTARES

OF SOIL HAVE BEEN SAMPLED AND TESTED BY NEWLY-TRAINED TECHNICIANS


“BEFORE FAO, I WAS A BASIC WORKER AT THE MINISTRY; NOW I SUPERVISE REGIONAL PROJECTS.”

PROFILES OF SUCCESS: FAHIMA

Fahima grew up in a well-known Kabul family, and her parents always pushed her to pursue whatever dreams she had. Those dreams changed over the years, but by 10th grade, they had materialized into a desire to be an engineer. Fahima was practical, wanted to work in the field, and wanted to take part in building her country's infrastructure back to what it had been previous to a decade of war and neglect. Fortunately for her, she was able to attend college at Kabul University, and got a MS degree in hydrotechnic engineering long before women's education was temporarily banned.

Out of grad school, Fahima started working with MEW, as a basic field engineer. She wasn't sure what her opportunities for advancement were, given the limitations on women in her society. When the Taliban came to control the government in 1996, she, like all other women, had to put her career on hold. Thankfully it was not a permanent hold, and she returned to work in 2001. And, when FAO started its' Emergency Irrigation and Rehabilitation Project (EIRP), she found her opportunity for advancement.

FAO hired her on to the Project as a design engineer, and immediately brought in technical experts to train her and her fellow engineers in basic English and computer skills as well as more advanced technical training from FAO on topics like environmental mitigation, supervision, and design and construction quality control. After training and hard work, Fahima moved from design engineer to supervisor in no time.

Fahima says "I dedicate much of my success and opportunities for advancement to my FAO mentor. He showed that he trusted me and he pushed me to reach my potential from day one. Every day of the past decade of working with him has been a pleasure." Her mentor, a long time FAO Afghan staff member, speaks equally positively of Fahima.

Today she is one of the few female and the most senior engineers working for MEW. She works both in Kabul and in the field, and has great relationships with all of the Provincial governors. "They may have had their doubts at first when they saw a female design engineer, but over the years they've come to respect my technical advice on water projects," she notes. Even better perhaps is the gratitude the beneficiary communities show her. One small community, in which her project built a prayer washing area by a canal, prays for her and her team every day, she tells us with a smile.

Fahima also takes a leading role in many FAO joint activities that require cooperation between MEW irrigation projects and other parts of FAO, she participates in government working groups and activities for women and agriculture, and she acts as a bridge between project beneficiaries and the FAO.

Working alongside FAO has made life unquestionably better. Fahima earns more money, gets respect from her colleagues, has autonomy in her job, and her career opportunities have been advanced beyond what she ever dreamed: she recognizes that it is possible that she could someday be nominated to be a direct adviser to the Minister of Water, like other FAO-trained colleagues have been. Or...perhaps even the Minister of Water? If Afghanistan continues to promote gender equality in agriculture, and all fields, the possibilities for well-educated women like Fahima are limitless.

During a tour of the Ministry of Water, Fahima was not the only woman I encountered doing great work there. MEW, as well as MAIL, is full of talented women in managerial positions. These women, originally or secondarily trained by FAO are essential for promoting agriculture to other women in the nation, as well as for building a strong, diverse and multi-talented agricultural workforce.

Does she try to convince other women to go into engineering? "Absolutely! It's such a great opportunity to get into the countryside and really be involved in the development of my beloved country's infrastructure." She encouraged her now-adult son and daughter to get into engineering too ..."but they had other plans"... she says with a laugh and a small shrug of her shoulders.

8 WORKING BEYOND THE NCADPP

FAO worldwide strives to implement projects which support host country goals.

FAO has, throughout its' history in Afghanistan, not only helped the government design its' strategic plans around agriculture, but it has also adhered to those guidelines when doing its' own plans and projects. The previous seven chapters of this report have been organized based on the seven primary chapters of the NCADPP. However, the work FAO does in country extends beyond the explicit bounds of the NCADPP and addresses other national agricultural priority areas. This last section of the report reflects those other areas of FAO's work that, while not necessarily called out in the NCADPP, are nonetheless key for improved agricultural productivity and food security in the nation. All of the topics in the forthcoming chapters are cross-cutting, and all of them have been and will continue to be essential components of Afghanistan's agricultural development into the foreseeable future.

The next chapter, on women in agriculture, is a chapter of the NCADPP under the section on cross-cutting issues. This is fitting, as women's empowerment underlies all of agriculture in Afghanistan and worldwide. Work on agriculture needs to not only recognize historical gender-based differences in agriculture in order to design appropriate projects, but it also needs to minimize those differences, or at least the social and financial power that comes with them.

Chapter 8.2, on the UN SDGs, highlights the work FAO has been doing to help GoIRA define targets and indicators for the SDGs. The SDG work that FAO is supporting has happened at national, sub-national and local levels, and takes a multi-stakeholder, inclusive approach so as to maximize community understanding and buy-in for SDG work. While not an explicit part of the NCADPP, working on the SDGs is important for every nation as we enter an era of growing populations, and changing climates. Reporting progress on SDGs also enables Afghanistan to remain in good standing in the UN and continue to receive development funds.

Chapter 8.3 is focused on emergency response. While emergency response should never be part of a national agricultural "development" plan, it nevertheless encompasses a large part of the work that FAO has done in country since the 1990's. At that time FAO Afghanistan was working out of Pakistan while the Taliban was in power. During these years, as well as the subsequent early years of reconstruction, Afghanistan was in such urgent need of immediate food and financial support, that implementing longer-term development projects was not practical. Instead, FAO, often in partnership with World Food Programme (WFP) or other UN agencies, responded to the most urgent crises as they occurred, and worked to stabilize the agriculture sector before investing in longer-term development projects. Emergency response will hopefully will be greatly reduced in the next 15 years. This is not because emergencies won't happen, but rather because Afghanistan will ideally take a pro-active, rather than reactive approach to emergency management. While earthquakes, for example, can never be prevented, other social and environmentally-based disasters can be averted. This means that climate change adaptation, resiliency, and social planning will need to be integrated into all agricultural sectors.

Finally, chapter 8.4 considers the work FAO Afghanistan has done on regional cooperation. These projects were designed knowing that most environmental topics transcend international boundaries, and therefore solutions to these problems can only be reached regionally. Further, scientists and technical specialists are often not hampered by the political limitations of career diplomats, and can enhance regional cooperation outside of the traditional pathways. Regional cooperation between scientists is, in short, a path towards regional peace.

Further chapters in the NCADPP on cross-cutting topics and enabling environments are not specifically addressed in this report; for some topics, it is because they are not in the mandate of FAO, for others, it is simply because a chapter for each of these topics would make this report even longer than it is. For example, while FAO guards against corruption, directly working on anti-corruption is not in its' mandate. Conversely, it is hopefully obvious to the reader that the planning, research and extension, farmer organizations, and private sector support that are named as "enabling environments" in the NCADPP are issues addressed by nearly every project FAO that has operated in country. From working with government ministries to plan, to empowering growers with farmer organizations to seeking private sector partnerships, FAO knows these enabling environments are essential if Afghan agriculture is to prosper without external support.

FAO's work does not necessarily neatly fit into one topic - projects on dairy support gender equality, projects on water management support climate adaptation, and policy work on SDGs encourages private sector investment into agriculture.

Featuring women on agriculture marketing materials creates an atmosphere of inclusion.

©FAO/see endnote[16]

8.1 WOMEN IN AGRICULTURE

Empowering women is not just a humanitarian issue – it is simply smart economic development. This is especially true for Afghanistan, where 70 percent of rural women are involved in farming or farm product processing, and where they account for 66 percent of the agricultural workforce[47]. However, much of women's agricultural work in Afghanistan is unpaid labor - such as weeding, irrigating, or food processing at the household level. Women are also the primary livestock care providers and carry out all activities from breeding, to milking to making dairy products and spinning wool.

Men do less manual labor, but act as links between households and markets in order to purchase farming inputs, and sell products. Men also play roles in the upper levels of value chains, as traders, wholesalers, retailers, and exporters. This gendered division of labor is largely a reflection of social and cultural norms, which do not allow women to interact with men, travel by themselves, or own land. As a result, women's access to credit, training, extension, inputs, and marketing networks is severely limited.

When women do run farms, studies have shown that their yields are 20 to 30 percent less than that of farms run by men. This is not due to any inherent inability to run farms, but rather due to this lack of access to inputs, linkages and education. Logically, this means that by giving women the same access to the same resources that men have, Afghanistan could improve agricultural yields significantly. Considering the impact agriculture has on the economy of the country, this would be no small achievement.

Only 29 percent of women are employed[48], and many of those are underemployed and seeking more work. They also tend to not be represented in sectors which have had higher growth rates recently, such as mining, construction, retail trade, restaurants, real estate, and more. However, women's agricultural labour has huge income-generating potential. Women are already involved in making jam, collecting cashmere, selling honey, marketing eggs, processing wool, and doing embroidery and leatherwork. The value of these products in 2014 amounted to USD 86 million and was 17 percent of the total export market.

One major impediment to women in agriculture is their access to assets, most particularly land. While women can own land under statutory law, customary traditions in the country make it likely that women renounce rights to land to male relatives. However, owning land is essential for economic growth, particularly in a country so dependent upon it for livelihoods. Owning land also allows one to have a source of collateral when loans for opening a business might be needed. And, when land disputes do occur, the disputes are handled by men; women often have no support in the event of a judgment against them.

A recent study in Afghanistan highlighted several areas which could be targeted if we are to realize the full financial benefits of women in agriculture[49]. First, while a Gender Statistics Unit does exist within the CSO, laws do not require that gender statistics are collected. Numbers and locations of women engaged in agriculture are essential for designing the best projects and policies to buoy women's place in the sector. Second, the study recommends studying links between women's participation in collectives and how this provides them access to markets. Third, it notes that women's mobility patterns need to be investigated in order to understand where women can travel, and how support could be given to female producers who cannot move freely. Finally, it recommends that more effort be put into women's skills and training, such as by creating e-learning systems for women with limited mobility, or adult education programmes that improve literacy and link it to livelihoods.

Given women's prominence in agriculture, the NCADPP rightly calls out empowering women in agriculture as a cross-cutting priority. It emphasizes many of the issues noted above: land, access to credit, and mobility as reasons that women's economic potential is not being reached. And, while MAIL has established a Gender Focal Point, mainstreaming gender has been a challenge because such focal points do not exist out in the provinces. It also notes that because of political change and the expanding economy, now is the opportune time consider the role of women in agricultural production and increase efforts to enable women to move beyond subsistence production into higher-value, market-oriented production. Add to this the fact that women-headed households are 13 percent more food insecure than male-headed households, and its' clear that empowering women in agriculture should be a cornerstone of economic growth, poverty reduction, and ending food insecurity.

FAO shares the GoIRA vision of empowering women in agriculture, and nearly every project that FAO operates in country has at least one component focused on developing women's agricultural productivity and

profits. This includes everything from livelihood projects focused on building cottage industries for women, to emergency response projects distributing materials responsive to women's mobility and specific needs. The **EIRP** and **IRDP** projects have gender inclusion project staff who make sure irrigation projects take women's concerns into account during project design, and things like washing platforms are built into irrigation works where women need them.

One of the most notable projects on women's empowerment is the previously described **Dairy Sector Projects**. Because women are the primary caretakers of cattle, developing the dairy sector inherently required training women to be better caretakers, producers and marketers. In 2015, the Social Protection and Rural Infrastructure division of FAO Rome, in collaboration with FAO Afghanistan, did a detailed assessment of the IDS projects to determine their quantifiable impact on rural Afghan women. The assessment concluded that the IDS projects were "the first stepping-stone for a large number of rural women in establishing a better place for themselves in Afghan society." Three more FAO projects that played a major role in empowering women in agriculture follow here.

The SALEH project, noted previously, had a large component known as the **Women Empowerment Programme (WEP)**. The immediate objective of WEP was the social and economic empowerment of Hazarajat women through training in literacy, practical skills and enterprise development. The ultimate goal was to evolve from an aid-based approach towards a development-oriented one that encouraged the women of the region to examine the status quo and set their own empowerment agenda. The programme had four stages: basic literacy and numeric skills, life skills, technical skills and enterprise development through the formation of producer groups. These stages were designed to be mutually reinforcing and increase livelihood opportunities for rural women.

Field activities began with a literary component. WEP staff identified local teachers and trained them in community mobilization, gender sensitization, project planning and monitoring. The literacy component included basic, intermediate and advanced levels. In the basic literacy course each literacy circle produced its own learning materials by analysing topics relevant to their lives like health, the village environment and domestic conflict. Such iterative group discussions promoted self-analysis and collective thought. For the intermediate level courses, a book was developed by UNICEF that covered similar topics, as well as hygiene and nutrition. This curriculum helped women practice reading, while also teaching them basic life skills.

A key objective of WEP from its outset was to build a strong cadre of village-level female teachers. A lesson learned from past community-based education projects was that the success of literacy circles largely depends on short, but regular teacher training sessions rather than single longer trainings. Local teacher training was thus staggered into periodic district-level monthly sessions. Resource centres were established in districts, and teachers were provided with storybooks, general knowledge books, teaching aids and audio programmes. These resource centres were designed to link the classroom and everyday life, and the material chosen for the resource centres was visually attractive and relevant to rural women, promoting self-initiative in learning. Many women described the relationship between learning and life improvements, such as how their new numeric skills led to more confidence in handling money and making purchases.

Three vocational training primers were also developed on livestock care, horticulture, and tailoring/handicrafts design. The primers thus taught women vocational skills while reinforcing their new literacy. All three modules were published and are now in use by various NGOs and donor agencies. ToT sessions were conducted with local teachers in each of the three topics. Now there is a core group of local female 'master trainers' who have remained as a resource within the village post-project. In total, WEP established 190 literacy circles, serving 3500 women in Bamyan.

Among the lessons learned from WEP was that, despite unanimous agreement among all stakeholders on the need for the programme, the plans were over-ambitious. WEP involved long-term processes that could not be rushed if they were to succeed and be owned by the community. And, in Afghanistan, where many aspects of women's progress are taboo or private, an important lesson for similar future programmes is that the pace of activities be must be determined by both the female beneficiaries and the men in their lives.

Another project focused exclusively on women's empowerment was the **Strengthening the Role of Women in Agriculture Development for Improved Household Food Security And Nutrition**[50] project. This project prepared a number of key documents that now serve as the foundation for work on women in agriculture. The key deliverable from this project was The National Strategy on Women in Agriculture Development, a document jointly prepared by MAIL and FAO. The objective of this Strategy was to identify priority areas for improving women's power

The Women's Empowerment Project of the SALEH project was a great example of the **One UN Approach**. The project built partnerships with other UN agencies working on adult literacy, such as UN Habitat, UNICEF, UNESCO as well as other national partners. Together these groups worked to improve women's literacy, finances and overall social power.

in and contribution to agriculture, with the end goal of increasing food security and alleviating poverty, especially amongst female-headed households.

The National Strategy was prepared following in-depth meetings with stakeholders, including MAIL departments and directorates, MAIL partners and projects, and other national ministries. The key issues addressed by the Strategy were the systemic undervaluation of women's work, and low stakeholder capacity to understand the roots of and responses to gender biases. The Strategy was complemented by an action plan that outlined major activities needed to empower female farmers and processors. Concurrently MAIL did a mapping exercise of different projects in order to make the projects more gender-sensitive. The finished Strategy was submitted to many high-level government officials - including the First Lady - for their comments, which were incorporated before the Strategy was endorsed by the Minister of Agriculture.

The Project also facilitated managerial trainings for the Home Economics Directorate (HED) staff of MAIL. The trainings included monitoring and evaluation, needs assessments, report and proposal writing, and impact analyses. HED was also supported as they finalized curricula and brochures on different types of agricultural production and disseminated the materials to women in rural areas. Project coordination was aided by the Women's Empowerment Advisory Group, which is led by the Director of HED, one of only two women leading a Directorate of MAIL at the time.

The Project also supported the celebration of International Women's Day for the first time ever in Afghanistan. And, though it did not do field-level implementation, it supported MAIL to use existing and new resources for women effectively. Capacity-building was focused on supporting women nationwide through home gardening, backyard poultry raising, home-based dairy processing, food processing, food storage, support for forming producer organizations and marketing local products.

Finally, the **HFLS Projects** were another example of women's agricultural empowerment. As noted in a previous chapter, the Projects both literally and figuratively spawned a new mushroom cultivation and marketing industry, all done by women. In collaboration with WFP, the project also helped women establish home vegetable gardens on their small plots of land. The women were organized into CIGs, and provided with intensive training and inputs to plant and operate highly productive kitchen gardens. By project end, almost all participating households had a year-round vegetable supply for home use and sale.

The backyard poultry component of the HFLS projects, implemented in the most vulnerable and resource-poor households in Bamyan, was also very successful. Almost all of the target beneficiaries were women from internally displaced households who had no access to land or other livelihoods. The project provided training, chicks, vaccinations and chicken feed for 300 households. The final project survey found that egg consumption and sale significantly increased among beneficiaries, as well as child weight. The HFLS projects took a holistic and highly successful approach to increasing the availability of healthy food, creating income, and empowering women.

Through these projects, and many others, FAO has played a leading role in bringing agriculture to women, pulling them out of poverty and bestowing them with the respect as agriculturalists that they deserve.

SUCCESS FOR WOMEN: AGHA MA

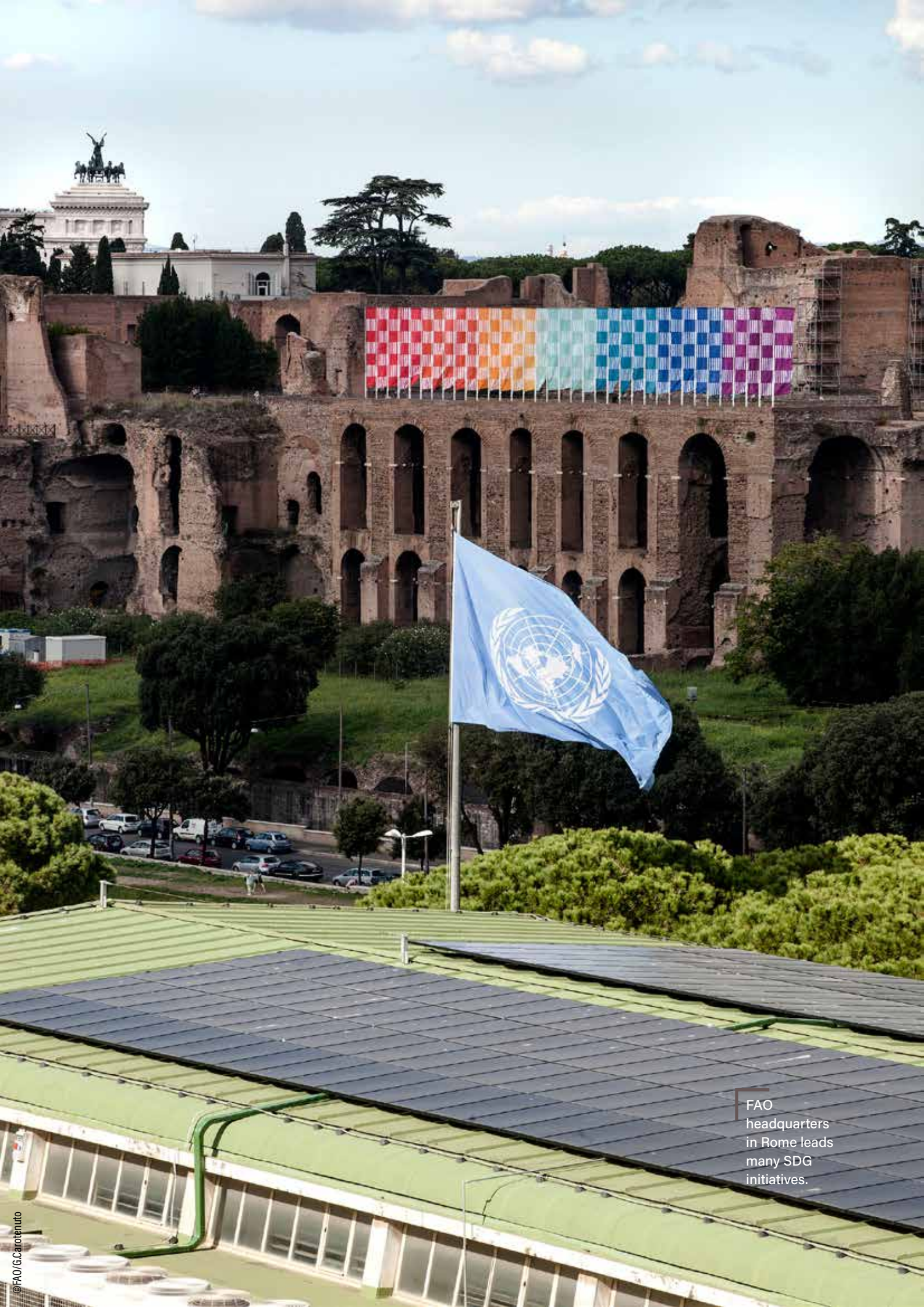
Sunlight shone down in patches on the colorful Afghan carpets that adorned the floors of the otherwise simple, mud-walled room. Drapes blew in the warm breeze coming in through the open windows, bringing in the smell of fresh air from the surrounding fields. Around the outside of the room was a group of happily chatting women, trying to balance talking to their neighbors with watching the children trying to squirm out of their reach. As the cohort from FAO walked in, the group slowly silenced - but not for long. They all had a lot to say about their work, their lives, and their time with FAO's TADs project.

The most vocal, most opinionated, and most senior woman in the group was Agha Ma. Agha Ma is the mother to seven children, and the beloved grandmother to many more, as evidenced by children clinging to her legs. Agha Ma has also been a lifelong pastoralist, like her parents before her. Her animals are her families only source of income. However, every year, and increasingly so in the past decade, disease claims part of her herd, making feeding her family a constant struggle.

That began to change two years ago, when the FAO livestock health project began training a group of female pastoralists Agha Ma's village.

Agha Ma said that "the project helped us save many animals. Our trainer shows us how sick animals appear, how and when to treat diseases, and how to check for pregnancy and adequate nutrition. The picture brochures have been very helpful - most of us can't read, but we can compare the pictures to our animals, and diagnose and treat disease before it spreads." She adds that they "used to get vaccines from the local market, but because we didn't understand the signs of disease, our animals were often too sick to save. And, the quality of vaccines was poor anyway. Our usual solution was to pray for our animals, because we knew the medicines were a waste of money."

Now, because of FAO, vaccines are often free, the herders know when to get them, and they lose fewer animals. This means more money for themselves and their families, and in Agha Ma's case, an education for her grandchildren that she never dreamed she'd be able to give them.



FAO headquarters in Rome leads many SDG initiatives.

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8.2 THE SDGS

The Sustainable Development Goals are a set of 17 internationally-defined goals agreed upon in 2015. These goals, proposed by the UN, were made official when more than 190 world leaders committed to the them. Their end objective is to end extreme poverty, fight inequality and injustice, and stop climate change, all by 2030, collectively known as Agenda 2030. The goals of Agenda 2030 are ambitious, but attainable with targeted and thoughtful effort at national and local scales. The SDGs apply to all countries worldwide, and every year, countries are asked to prepare reports for the UN on how they are meeting these goals.

In addition to working towards its' own Strategic Objectives, FAO works worldwide to ensure that the host country governments are working towards meeting the SDGs. FAO projects cross-cut all 17 SDGs, if not directly, than indirectly through positive impacts on peace, governance, gender, security and other important aspects national development and social progress.

Officially, FAO is the "custodian" UN agency for 21 indicators across SDG 2: Zero Hunger; SDG 5: Gender Equality; SDG 6: Clean Water and Sanitation; SDG 12: Responsible Consumption and Production; SDG 14: Life Below Water; and, SDG 15: Life on Land. FAO is a contributing UN Agency for six more indicators. These indicators, range from targets on reducing hunger, to minimizing water stress, to stabilizing food prices to increasing mountain green cover.

In Afghanistan, FAO, along with the Government, are particularly focused on SDG 2, which aims to end hunger, through food security, improved nutrition and sustainable agriculture. To these ends, FAO has been working to make sure food security and agriculture are part of the national SDG debate; FAO also works with MAIL on SDG-12 and SDG-15.

The Government is fully involved in setting targets and achieving the SDGs. The SDG Secretariat sits within the Ministry of Economy under the leadership of the President of Afghanistan. The Ministry of Economy is responsible for monitoring and evaluation of progress on the SDGs, and reporting this progress to the rest of GoIRA and the UN. Other ministries within the government are responsible for planning and action on SDG indicators, and they report on progress regularly to the Ministry of Economy.

MAIL and FAO have adopted an approach to mainstreaming SDGs into the agricultural sector that first recognizes that all stakeholders must be involved, that public awareness of the SDGs needs to be raised, and that the SDGs need to be tailored to national, and local contexts. There must also be monitoring, reporting and accountability specific to the SDGs.

FAO has been helping MAIL with SDG implementation in myriad ways, including by: guiding MAIL as they align their SDG targets and indicators; preparing an SDG mapping matrix; conducting a detailed baseline analysis of where Afghanistan is currently at on the SDGs; preparing a Roadmap for SDGs; mobilizing resources for SDG support work; developing materials for SDG awareness raising; training MAIL staff on how to monitor progress against targets; and, facilitating a collaboration between MAIL and the Ministry of Economy to finalize the agriculture-relevant SDG goals.

Thus far, the SDG Roadmap has been the subject of the most intensive work. It has been designed to address the following indicators:

2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.

2.2: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.

2.3: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

2.5. Increase investment, including through enhanced

international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.

2.6 Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.

12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.

15.1. By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.

15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.

To address these indicators, the Roadmap proposes that five steps be followed. First, multi-stakeholder workshops at national and sub-national levels must be held to raise awareness and solicit pubic support for the SDG process. Second, an investment programme must be designed to address identified development gaps. Third, development plans and budgets at the national and sub-national levels need to be aligned with the defined targets. Fourth, funding from national and international sources needs to be mobilized to cover these gaps. And then, finally, Agenda 2030 must gradually be implemented.

Aside from helping MAIL with the SDGs, FAO is also a member of an inter-ministerial working group on SDGs related to agriculture and rural development. And, at the UN level, FAO has been working with the UN country team, to identify and engage the appropriate Ministries in achieving the SDGs.

Each FAO project in Afghanistan contributes to some of the above indicators directly and indirectly. And, all projects report on their progress in addressing the SDGs. However, one project has taken the lead in SDG coordination and ensuring the Roadmap and the other activities noted above are in place. This is the **Food**

and Nutrition Security Impact, Resilience, Sustainability and Transformation (FIRST)[51] project.

As part of FIRST, FAO and MAIL have supported six SDG workshops across the country, in total covering nearly all 34 provinces. The workshops were held both to raise awareness about the SDGs, as well as to work with stakeholders and map out financial and development gaps for the selected indicators.

Because the SDGs are a society-wide agenda, such public workshops are central to the success and quality of such an agenda. Multi-stakeholder, transparent policy development and implementation are used to encourage partnerships between the government and civil society, universities, think tanks, the private sector, development actors, and human rights institutions, all of whom have important roles to play if Afghanistan is to make progress on the SDGs.

Likewise, community participation begets community ownership. Local ownership is instrumental for all development projects, and perhaps even more so in SDG projects, as these goals are high-level and not always obvious to people outside of the policy world. Broad participation also ensures that people living in poverty, persons with disabilities, displaced persons, and children are not forgotten even though they may not be participating in policy-making processes. And, national audiences must take an active role in linking the SDGs to their concerns, ensuring meaningful progress on the SDGs.

In early 2018, FIRST held seven workshops nationwide to raise awareness about the goals and subgoals, and coordinate planning to help Afghanistan reach these them. The topics covered in each workshop were wide-ranging, from low water tables, to a lack of electricity, to the rapid urbanization of agriculture land, to poor transportation, and more. All in all, these workshops had 220 participants from 22 provinces, and despite whatever specific issues discussed, themes of building public awareness, linking investment plans with the SDGs, and supporting the plans with reliable local-level data and information emerged at every workshop.

The challenges of implementing the SDGs was also a common theme; the challenges cited echoed the challenges faced by all development projects in Afghanistan. For one, there is insufficient technical and policy expertise in country with respect to the SDGs. The country has a growing cadre of excellent scientists and technical experts, but these experts typically lack practice in linking data to policy action. Another major issue is that measuring SDG progress is hampered by a lack of baseline data. FAO has been working on collecting this data in recent years through household surveys, agricultural censuses, and the land cover database. However, much more data still is needed in the agriculture sector. Finally, because of poor coordination among national ministries, SDGs are not targeted as efficiently as possible, likely leaving both gaps and duplications in efforts between ministries and programs within ministries.

To help with this latter challenge, the FIRST project sponsored a delegation of high-level government officials and members of the Afghanistan Food Security and Nutrition Agenda to travel to Bangladesh. The purpose of the mission was to learn about how inter-ministerial and multi-sectoral coordination has helped Bangladesh improve its' food security at a relatively rapid pace over the past 40 years.

Lessons from Bangladesh that were particularly applicable for Afghanistan included those on planning nutrition- and climate-sensitive agriculture projects; fortification and bio-fortification of key foods; development of environmentally-friendly pesticides and stress-tolerant crop varieties; and, the use of local farm technologies. The government of Bangladesh has also fostered collaboration with the private sector while still keeping farmers at the heart of its' development agenda. As noted in the beginning of this report, such a farmer-centric approach is a priority for Afghanistan, and was the basis for establishing the CIGs and FFSs that are the core of many FAO projects.

This sort of South-South Cooperation is a useful way for Afghanistan to build its' institutional capacity, using lessons learned from countries with similar economic and social contexts, and minimizing the need for larger-scale international intervention. As SDG work continues, Afghanistan may choose to continue these sorts of international collaborations, not only as way to speed up the pace of development, but also, as discussed in chapter 8.4, as a way to foster regional peace.

In 15 years, FAO has donated tens of thousands of metric tons of certified seeds to Afghanistan during food crises.

8.3 RESPONDING TO CRISES

Afghanistan is a country prone to natural disasters. It's mostly arid climate, mountainous landscape and position over a fault zone means that it experiences flash floods, droughts, landslides, avalanches and earthquakes, in addition to frequent attacks from insect pests and disease. Within low-income countries, Afghanistan took second place, surpassed only by Haiti, in terms of the numbers of human fatalities from natural disasters between 1980 and 2015[52]. And losses don't end with lives. Each disaster destroys homes and villages, decimates agricultural lands, and ruins infrastructure, slowing the precious development gains that have been made in the last 15 years.

Decades of conflict have undermined the country's ability to cope with these disasters. The institutions that should be ready to respond to disasters, and the infrastructure that can support disaster response either does not exist or is inadequate, making hazardous situations turn into disastrous events more quickly than they would if these protective measure were in place. Disasters also lead to a negative feedback loop with conflict - while they may not directly cause conflict, they strain already fragile social and financial systems and can make conflicts stronger or more extended.

Add to all of this climate change, which as noted in Chapter 5, is a threat multiplier. In the social realm, this means that climate change exacerbates existing conflicts and can turn a hazardous situation into a full-blown disaster. In the environmental realm, climate change increases the number of weather-based and pest or disease-based disasters, and can make recovery from non weather-based disasters more challenging as the natural resource base is degraded.

For all of these reasons, disaster response has always been a major part of FAO's work in Afghanistan. And it will continue to be for the medium-term future, as Afghanistan continues to rebuild and strengthen institutions which are able to nimbly respond to disasters. However, disaster response is never as financially-effective as emergency preparedness, and, it has the additional cost of more lost lives and productivity. So, while FAO will continue to work on disaster response, its' goal is to help the government take a proactive rather than a reactive approach to disasters, strengthening early warning and early action, and minimizing its' role in future disaster responses.

In the past 15 years, FAO has supported at least **80 short-term emergency response projects**, plus a small number of longer-term emergency preparedness and response projects. These projects addressed emergencies across the agriculture spectrum and across the nation; though flash floods are the most common natural disaster in Afghanistan, drought was the most frequent cause of the emergency situations for which FAO provided assistance.

As an example, in May 2007, after 10 years of below-average precipitation and an especially cold winer, rising food prices were causing malnutrition rates to increase rapidly. FAO responded by distributing 200 metric tonnes of wheat seed and 400 metric tonnes of fertilizers to 4000 vulnerable households in Panshir and Kunar[53]. Beneficiaries were smallholders, those who had lost more than half of their production due to the natural disaster, and marginal groups (IDPs, widows, elderly) with access to land. These inputs were used during the spring and autumn 2007 planting season, and all were sold at 50 percent cost to farmers. The funds collected from sales were then reinvested into development projects for and chosen by the communities. Because the yield of the FAO-distributed wheat varieties was higher than that of local varieties, farmers were not only able to grow enough to feed their families, but were able to sell the surplus, make a profit, and start to break out of the cycle of poverty they'd become trapped in over the past decade. And, there were cascading positive effects for their neighbours, who had access to improved wheat seeds for the next season through farmer-to-farmer sales and exchanges.

Drought response, though common, is not the only type of emergency response FAO engages in. In 2003, a ruinous sandstorm hit Shib-i-Koh and Lash-i-Juwain districts in Farah. The sandstorm destroyed or blocked the very basic irrigation structures that were in place, promising that the growing season would be fruitless unless the structures were quickly repaired. So, a cash-for-work program[54] was quickly implemented that functioned to clean and repair irrigation structures, as well as provide needed income to the most vulnerable households, such as IDPs, returnees, and landless families. In total, the project employed 2905 locals over 109 927 person-days of work, and trained 210 farmers, mirabs, and PAIL staff in irrigation system management. The repaired structures further benefited an estimated 13 000 farming families in the two districts, and 850 *shuras* (community representatives) were given sets of tools for the maintenance and cleaning of canals and other water structures.

One of the limitations of the project was that women could not be employed due to cultural restrictions, though they would still benefit from improved water structures. Such a limitation highlights the need to continue to work on improving women's participation in and access to employment in agriculture.

In an attempt to anticipate the necessary emergency responses, FAO produces regular multi-annual humanitarian response plans. The most recent, for 2018-2021, has highlighted the need to develop capacity to respond quickly, and do better and more timely assessments on food security. This recent plan also cites a goal of assisting one million people with USD 21 million of support within 2018 alone. There are many focal areas in the plan, and most of them are aimed at building resilience, so future humanitarian responses can be lessened. The foci include: restoring agricultural production through distribution of inputs and pest control supplies; support for kitchen gardens; training on wheat growing; improving livestock through distribution of feed and vaccines; supporting backyard poultry; training on livestock husbandry; and, developing food security contingency plans.

Another important facet of FAO's emergency response work is the **Food Security and Agriculture Cluster (FSAC) in Afghanistan**. FSAC is part of a worldwide coalition that is activated in countries with humanitarian crises and associated frequent and/or acute food insecurity. In Afghanistan, the FSAC working group is co-led by WFP and FAO, with a revolving series of NGOs as co-chairs. FSAC's aim is to "provide an action-oriented forum...for national and international humanitarian partners to improve the speed and effectiveness of humanitarian assistance." FSAC is based in Kabul, operational in five regions, and is constantly working to establish a larger sub-national structure. It is made up of over 167 partner organizations, including international and national NGOs, Red Cross/Crescent societies, provincial ministries, UN agencies, research institutes and donors.

To improve humanitarian response, organizations must coordinate to avoid overlap, share expertise and information, and continuously assess and learn. FSAC meets monthly, or more as needed, to do such coordination and make sure that the humanitarian response community is prepared for any possible disaster that will impact food security and /or agricultural livelihoods. Since 2011, FSAC has produced hundreds of assessments, recommendations, newsletters, courses and maps to support emergency food response. All documents are available online at www.fscluster.org.

One of the first studies undertaken by FSAC was an examination of lessons-learned from the 2011 drought emergency response, which affected 2.8 million people in fourteen provinces. FSAC partners conducted a joint food security assessment to gather information about the severity of food insecurity, which was then used to make decisions about emergency programming for 2012. FSAC then began performing yearly Integrated Food Security Phase Classification (IPC) analyses. These analyses use a combination of GoIRA, WFP NGO and FAO data, and on-the-ground surveys, and are jointly completed by FSAC members. The surveys answer questions about the severity of food insecurity, who will be affected, and where, when and why. The IPC protocols ensure the questions are answered in a comparable, transparent, and consensus-based manner; the answers help the humanitarian community classify the severity of food insecurity and infuse data-based decision-making into humanitarian responses. With support from iMMAP and others, FSAC also produces yearly IPC maps for the country.

As the IPC process was rolled-out, training workshops on IPC Protocols were given to the Afghanistan Food Security Technical Team, which is comprised of GoIRA, NGO and UN staff. The trainings taught the team to carry out consistent analyses, as well as give them a shared general understanding of food security, nutrition, livelihoods, vulnerability, and their inter-linkages. FSAC has continued to support regular trainings for FSAC members and associates on food security, disaster preparedness, proposal writing and communications; doing this helps to ensure that FSAC products are consistent, data-drive and useful.

FAO and FSAC also support and/or carry out a wide range of other assessments relevant to the disaster response community. For example, in 2012, FSAC partners did a gender study that aimed to provide information to support gender-based initiatives for food security that were culturally and regionally appropriate, and responsive to the different needs of females and males at different stages of life. The study used diverse information to create a contextual picture of how gender had been integrated into emergency cash transfer, food assistance and home gardening interventions. Results from the study have been used to improve FSAC partner programming so that food security disaster responses are gender-equitable, and don't exacerbate existing community tensions.

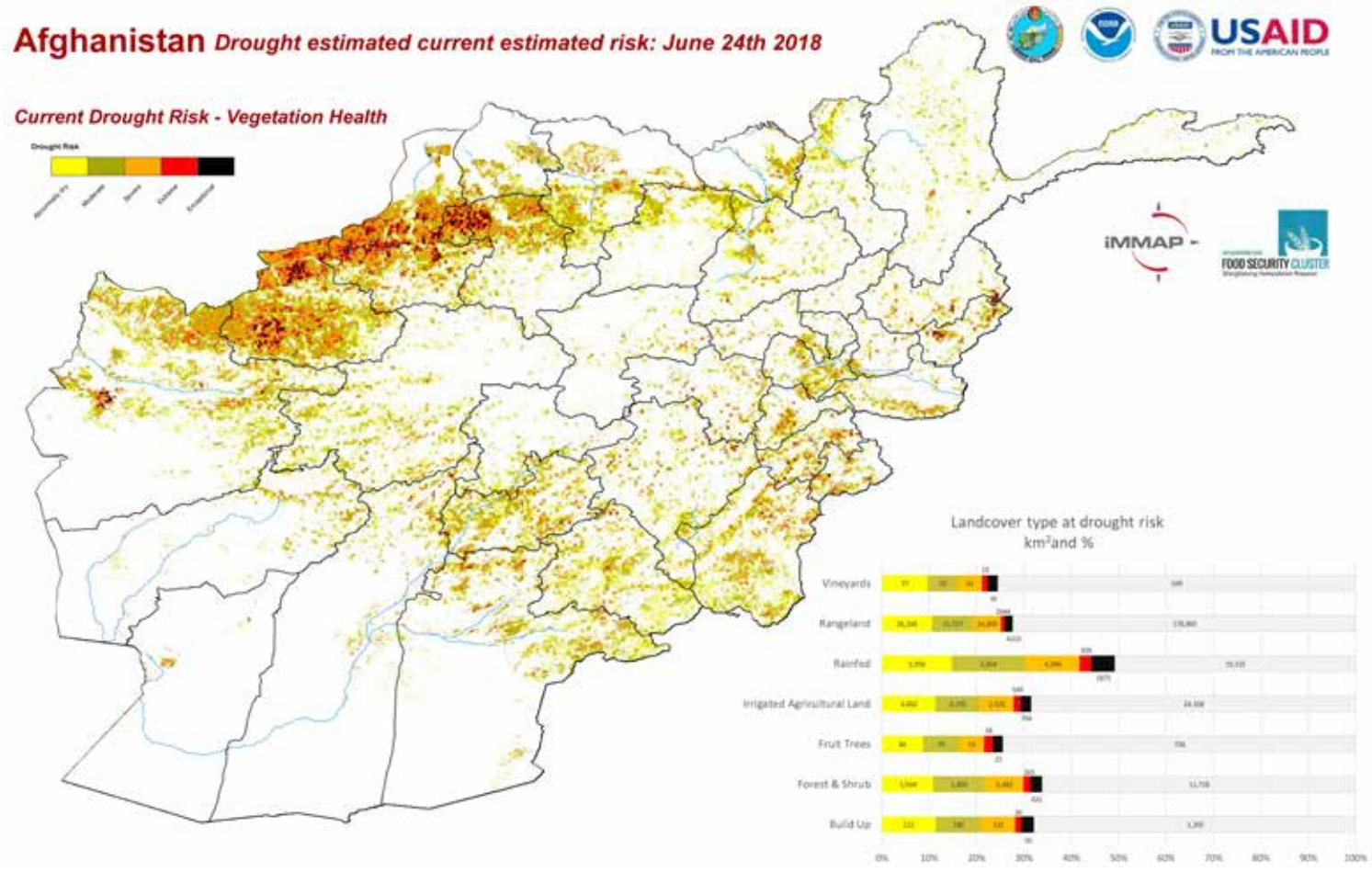
Other reports and products FAO, WFP and other FSAC partners have produced are beneficiary feedback studies, climate assessments, pre-harvest food security assessments, locust infestation estimates, late frost

rapid assessments, urban poverty reports, market price bulletins, population estimations, livestock, food and cash assistance maps, quarterly newsletters, and other reports, assessments and maps related to a food security disaster response and preparedness.

In early 2018, FAO, conducted a rapid dry spell assessment with the support of MAIL. This assessment used a combination of government hydromet station data, satellite estimates, UN agency expert interviews, and farmer focus group discussions to understand the physical extent of the winter 2018 drought, as well as farmer perceptions about financial and food security for the coming harvest season. This rapid assessment was conducted in 20 of the most drought-affected provinces in the country, and found that for many of these provinces, farmers were already planning to borrow money, plant alternative crops, distress sell animals, or move and become another one of the internally-displaced refugees. Such actions were necessary for many poor smallholders in order to survive the coming harvest, or lack thereof.

Following the release of this assessment, GoIRA announced that the country was in a state of emergency due to drought. FSAC partners used the dry spell assessment to plan a further pre-harvest assessment, and plan where to send disaster response supplies when donor funding became available.

FSAC international and national members have acknowledged that the group has improved coordination and communication among members, helped avoid duplication, saved money, effectively responded to cross-sectoral issues, and strengthened the overall ability of Afghanistan to respond to and prepare for food security emergencies.



FSAC map produced to support the 2018 drought response.

Regional projects allow Afghan agricultural experts to build trust with neighboring countries.

8.4 REGIONAL COOPERATION

Scientific and environmental issues don't recognize international boundaries. Plant genetic material can be swept by the wind between countries, animals can traverse political territories unimpeded, and climate change affects every country and region indiscriminately. But, despite the universality of environmental and agricultural issues, the policies dictating them typically stop at international borders, where differing and sometimes clashing political priorities collide.

Recognizing that agricultural challenges and solutions don't stop at borders, both FAO headquarters in Rome and FAO Afghanistan have implemented a number of regional projects over the past 15 years. These projects are far smaller in number than country-specific projects, but their positive impact can be just as big, as these projects not only try to solve agricultural challenges, but they provide a path towards regional cooperation.

One small, but far-reaching example of such a project was on **Regional Support to Alleviate the Impact of Soaring Food Prices on the Most Affected Vulnerable Farming Populations**[55]. This project grew out of a growing clarity in early 2008 that rice-importing countries could not rely on the international market, as some of the largest exporters of rice banned rice exports in response to high prices. This spurned a renewed emphasis on achieving rapid increasing domestic rice production, in the expectation that this would bring down food prices for consumers, while providing assured access to food for the countries of this region. The FAO Initiative on Soaring Food Prices aims to rapidly increase domestic food production by providing agricultural production inputs to smallholder farmers and giving advice on policy measures. In 2008, Afghanistan was one of ten Asian nations to take part in this project.

The main objective of the project was to strengthen capacity to boost smallholder food production, address soaring food prices, and ensure there was sufficient national capacity monitor and analyse the food security situation. Specifically, the project aimed to coordinate Initiatives on Soaring Food Prices projects in participating countries, support local implementation, build on short-term projects by formulating medium-term projects, and to organize policy training courses for government officials.

Over the course of the project, rice-growing inputs were given out, and a national consultant did an assessment to determine the success of the project in achieving the aim of improving rice yields as well as lowering food prices. Across most countries, the quantitative assessments of productivity found crop yield improvements of up to 40 percent, compared with a year before the project was implemented; the assessments also showed that production, access to food, and the sales of agricultural products increased.

Two regional and subregional workshops were held during the project; these projects allowed representatives from Afghanistan to travel to Bangkok, work with their counterparts from other Asian countries, and learn more about the impacts of national food production on international markets. It was concluded that international prices were not necessarily a good guide for development of national markets and a major underlying cause of the recent price surge and the 2007-2008 food price crisis was the neglect of agriculture by the international community and national governments. The project therefore not only gave Afghan representatives the opportunity to work on food security with its' neighbors and build regional-level understanding, but it also uncovered information that will be useful for regional growers and policymakers during future food price spikes.

Another regional project on food security was aimed to **Strengthen the Capacity of the South Asian Association for Regional Cooperation (SAARC) in the Development, Coordination and Monitoring for a Regional Food Security and Nutrition Network**[56]. This project was begun when the SAARC Secretariat and the associated SAARC Agricultural Centre (SAC) identified two needs: first, to develop, coordinate and evaluate regional programmes on food and nutrition security. They also recognized that in light of the food price crisis of 2008, regional food trends, and Agenda 2030, they needed to revise their food and nutrition security vision, strategies and programmes for the region.

The project had two major objectives. The first was to develop the SAARC Food and Nutrition Security Framework and the associated Strategic Plan of Action. The second was to strengthen the institutional mechanism and human capacity of the SAARC Secretariat and SAC to develop, implement and coordinate regional programmes for enhancing food and nutrition security in the region. All objectives were successfully met, beginning with the joint creation of a Framework for the region.

The Framework outlined five focal areas that SAARC would prioritize: 1) Promoting a sustainable and stable increase in the production of safe and nutritious food; 2) Improving the stability and efficiency of food markets and trade; 3) Promoting a nutrition-sensitive value chain and nutrient-enhancing dietary diversity; 4) Developing response mechanisms to overcome food emergencies; and, 5) Developing and sharing an integrated FNS information system. Following on from the development of the Framework and related action plan, SAC staff and the FAO team came up with a series of regional-level project proposals, on improving seed delivery, promoting pulses to achieve food security in, fostering agricultural trade, strengthening a regional food and nutrition security information system, and improving control of TADs, all through enhanced regional cooperation in South Asia.

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Regional peace- and friendship-building at the Transboundary Animal Disease meeting.

This strategic prioritization process has now led directly to some of FAOAF's most active and successful regional programming. Over the past 15 years, FAOAF has designed and helped implement a number of projects that aimed to control or eradicate TADs. One of the earlier projects on TADs was calculated to **strengthen cross-border surveillance and containment activities on Highly Pathogenic Avian Influenza (HPAI) between Afghanistan and Pakistan**[57]. The project was started because both countries had experienced HPAI outbreaks in border areas in 2008. Such outbreaks had huge economic impacts for both countries as a result of trade bans, the costs of quarantine measures, and the reluctance of the population to consume poultry products; poor rural poultry producers were hit the hardest.

The project worked in four border provinces in Afghanistan (Nangarhar, Khost, Balkh, and Kandahar), as well as four provinces in Pakistan. The provinces chosen were either areas that had the serious outbreaks of HPAI, or were on well-known poultry trade routes in the region. The viruses in both countries were genetically similar subtypes, suggesting intensive trade in porous border areas with poor security and no screening measures was the path for the outbreaks.

At the beginning of the project, there were no lab technicians in Afghanistan dedicated to HPAI diagnosis. So, MAIL designated two members of the national laboratory to be trained on serology and another two on molecular diagnosis; Pakistani technicians received the same plus more advanced trainings. Laboratories in both countries were given the equipment and reagents to conduct serological tests for HPAI screening. A diagnosis manual was written and standard operating procedures were established for laboratory tests in both countries. And, a computerized Avian Influenza Surveillance Information System (AI-SIS) was designed

to manage data collected during surveillance. The system allows users from both countries to quickly communicate and obtain location-specific lab results.

A year into the project, the central laboratories in both countries participated in a proficiency test conducted by the World Organization for Animal Health Reference Laboratory in Italy. The Reference Laboratory sent HPAI positive and negative samples to the labs in Afghanistan and Pakistan. Both laboratories tested the samples and scored at least 80 percent of the samples correctly, demonstrating satisfactory precision in testing for HPAI. Today, technicians from both countries continue to work and build capacity in concert, protecting each others' poultry industries, growing the regional poultry economy, and building trust between producers and consumers across national borders.

Last but not least, as noted in chapter 4, the ongoing **TADs project** is largely focused on building international cooperation around diseases affecting cattle, sheep and goats. While the Project is working domestically to train pastoralists vaccinate, identify diseases and treat them before they spread, it is also focused on stemming the flow of sick animals between neighboring countries. If this flow isn't stemmed, no amount of in domestic measures will ever contain the endemic diseases.

So far, the Project has hosted two multilateral meetings, as well as almost 10 bilateral meetings between animal disease experts from the participating countries. As of the most recent multi-lateral meeting in mid-2018, Afghanistan, Iran, Pakistan, Tajikistan and Uzbekistan were all working together. The meeting began with opening speeches from the FAO Representative in Afghanistan, the FAO Sub-Regional Coordinator and delegation leaders from each country. Turkish press covered the opening of the event and interviewed several participants. Following this, the bulk of the one-and-a-half day meeting was spent in epidemiology, laboratory, and quarantine working groups.

In these groups, participants hashed out issues ranging from the importation of eggs without expiration dates to inadequate awareness about animal disease control projects to developing rapid field tests for regional diseases. The most fervently debated issue was that of illegal animal movement across borders. Participants passionately discussed the need for law enforcement to stop these illegal animal crossings. While no one was in disagreement about what was needed, delegates all acknowledged that this challenge was difficult to solve. Stopping illegal animal movement is difficult due to very porous borders in mountainous areas between Afghanistan and it's neighbors. Policing animal movement is difficult in such areas under the best of conditions; insurgents causing security challenges compounds the challenge, making it nearly impossible to solve in the short term.

Overall, delegates found the meeting to be incredibly useful for prioritizing and planning regional animal health needs. The meeting ended with plans for further regional coordinating meetings as well the co-design of a regional-level project on fighting TADS. And, as one Afghan delegate noted "This meeting isn't just about animal health; this meeting is also about regional peace."

FAO'S **REGIONAL COOPERATION PROJECTS**

THE SAARC PROJECT DEVELOPED REGIONAL-COOPERATION PROJECTS ON TOPICS RANGING FROM NUTRITION INFORMATION SYSTEMS TO IMPROVED AGRICULTURAL TRADE.

THANKS TO FAO-SPONSORED TRAINING, LABS IN PAKISTAN CAN NOW CREATE AVIAN INFLUENZA VIRUS ANTIGENS QUICKLY AND CHEAPLY BOTH FOR ITSELF AND FOR AFGHANISTAN.

DELEGATES FROM AFGHANISTAN AND NEIGHBORING COUNTRIES ARE WORKING ON AGREEMENTS TO COMBAT REGIONAL RUMINANT DISEASES, PROTECT LIVELIHOODS AND PROMOTE PEACE.

HEADING TOWARDS A MORE RESILIENT FUTURE

As this report has shown, FAO addresses the Government of Afghanistan's agricultural development priorities in every way...and then some. Every project is conceptualized in response to requests from MAIL, MEW, NEPA, MRRD and other government partners, and designed with the full participation of the communities and people the projects will benefit. This inclusive approach has always been FAO's modality, and it always will be in the future. But, as we near a new decade, and the end of the current agricultural development plan, the question is: what should be Afghanistan's agricultural development priorities for the next 15 years?

Private sector development will unquestionably continue to be a priority. And, with donor funding decreasing, it is more imperative now than ever before that Afghanistan develop a domestic economy that is less fueled by international funding. Civil stability everywhere is buoyed by strong economies, where all people have access education and decent work. A strong private sector, that generates domestic revenue, makes the country less import-dependent, and provides work that can contribute to civil stability. Given that agriculture already predominates in manufacturing industries and contributes around 25 percent to the GDP, quickly growing agribusinesses is a logical choice for private sector development.

Education and capacity building will also undoubtedly continue to be priorities, across all sectors. Before 1979, Afghanistan had the most prestigious education system in the region. While much of that educational talent was lost during the years of conflict, it is clearly returning. Girls are back in school again, university enrollment is on the rise, and the Government is earnestly building the capacity of its research and policy staff through manifold training programmes. In agriculture, wheat and livestock research is improving and awareness about food safety, nutrition and hygiene is becoming widespread. These gains are significant, but for agriculture in Afghanistan to continue to sustainably grow in Afghanistan, agricultural and environmental education must also improve at a rapid pace.

But while developing a stronger private agribusiness sector and strengthening agricultural and environmental education and research will lead to more rapid agricultural improvements, business and education alone cannot support an industry that relies on natural resources. Those resources need to be healthy, diverse, and resilient to disasters and change.

Climate change and its' impacts on agriculture was a theme throughout much of this report, and it will be a growing theme throughout agricultural programming worldwide in the future. In many countries, it already is.

A changing climate is inevitable, and while minimizing GHG emissions into the atmosphere may prevent the most devastating impacts, many scientists think the world is already over the tipping point: icecaps are breaking off in Greenland and Antarctica, permafrost is melting across northern latitudes, and deserts are expanding. Increasing heat waves, droughts, floods, insect infestations, severe storms and soil erosion are just some of the direct and indirect impacts of climate change. These impacts often hasten the depletion of natural resources, and when natural resources are scarce, local conflicts, IDPs, and cross-border refugees have been shown to, in some cases, increase, leading to magnified civil unrest both domestically and abroad.

In Afghanistan, climate change impacts are exacerbated by the already-existing water scarcity in much of the country. This scarcity is highlighted by the ongoing drought at the time of the writing of this report. While not considered a water poor-country, the water in Afghanistan is unevenly distributed, concentrated largely in the upper reaches of the river basins that flow out of the highlands; this does not necessarily correspond to where most people live or where most agricultural activity takes place.

Therefore, one of the foremost challenges Afghanistan must tackle in order to make sure its people are resilient to climate change and climate-induced disasters is managing its existing water resources. This means building more primary and secondary canals, more check dams, and more water reservoirs and holding ponds. Such infrastructure not only transports excess water to where it is needed, helping to equitably distribute resources and minimize local disputes, but it also mitigates the worst impacts of flooding by having structures that redirect and save flood water.

Water infrastructure is of course not the only solution to increasing Afghanistan's resilience, though it is one of the most important issues in the near term. Replenishing shrinking groundwater levels,


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rehabilitating rangelands and reforesting the country are also urgent needs, as these environmental features all provide valuable ecosystem services that improve agriculture and make human lives stronger. Reforestation, for example, helps keep more water in the soil through plant root systems (thus replenishing groundwater), prevents erosion (thus keeping nutrient-rich soil in place), and provides micro-climates for humans, animals and beneficial insects (thus increasing or preserving biodiversity). Restoring rangelands will likewise reduce erosion, while providing better fodder for livestock, improving the resilience of herders and their herds.

And while abundant and well-controlled water can sustain productive agricultural livelihoods in Afghanistan and around the world, water alone will not solve tomorrow's agricultural challenges. All of the Earth's systems work together as a whole, and if we want to successfully address agricultural or environmental challenges, we must look at the whole, and not individual parts.

That means that while water needs to be channeled and conserved, Afghanistan also needs to be doing more research to identify drought-resistant crop varieties, the development community needs to be teaching farmers to conserve soil moisture by going back to low-tilling, cover-cropping and other forms of conservation agriculture, and it needs to be find ways to minimize emissions from the livestock sector. Crops should be diversified so that a community doesn't lose all livelihoods from the failure of one crop, and all of the world needs to think carefully about what it eats, how much food is wasted, and how that excess food can be used in ways that are productive, rather than destructive, to the land and the atmosphere.

Afghanistan's development community needs to be teaching people, from government officials, to schoolteachers, to farmers, about how to make themselves, their jobs, and their families more resilient to whatever future changes may come. Communicating about natural disaster likelihoods and impacts, and providing people with self-empowering solutions may be all the push that is needed to make a particular sector or particular community sustain through challenging times. This is especially true of farmers in Afghanistan and worldwide; farmers live with the land and live off the land, and they are usually the first to want to adapt to changing ecological conditions.

Interviews with people in agricultural industries done for this report and other recent surveys by FAO Afghanistan revealed a similar theme: everyone, everywhere is worried about water and the climate. They see that more flash floods are washing out villages, notice that it is hotter than ever, and observe that wells need to be dug deeper each passing year. Not everyone had heard the words "climate change," or *tayir iklim*, but they can see and feel its impacts. Potato growers in Bamyan were troubled about the snowpack above them disappearing, livestock keepers in Nangarhar were concerned about sheep being ill from poor fodder on rangelands, and teachers in Ghazni were apprehensive about growing conflicts between neighbors over access to water and land.

But, despite the challenges presented by climate change, they are not insurmountable challenges. Climate change also may bring longer growing seasons in some areas, and open up others to cultivation that were previously too cold. Climate change will also compel humans to innovate, conserve, and think about how their actions impact everyone around them, whether on the neighboring farm, or in the city a mountain range away.

Donors are increasingly investing into climate change adaptation and mitigation projects, and entrepreneurship in the climate and clean energy fields is growing rapidly. FAO programming will always support the needs of national governments, but at the same time, must be responsive to donor priorities and the needs of the communities that benefit from its' work. And as we enter an ever-more uncertain future, making sure these communities are resilient to whatever changes may come their way will hopefully be a priority for governments, donors and communities alike.

FAO has worked hard since 1945 to ensure that farms are productive and people are healthy. It will continue towards those goals, making sure that the children of today grow up healthier, wealthier and ready to be the agricultural innovators that we need to make both Afghanistan and the world a safe, resource-rich and beautiful place to live long into the future.

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54 ECHO/TPS/201/2003/13007: USD 400,000 funded by the European Commission's Humanitarian Aid Office from 12/2003 - 01/2005

55 TCP/RAS/3204: USD 500,000 funded out of FAO Technical Cooperation Program central funds, from 11/2008-10/2011.

56 TCP/RAS/3508: USD 474,000 funded out of FAO Technical Cooperation Program central funds, from 06/2015-12/2017

57 OSRO/RAS/703/USA: USD 3.2 million, funded by the United States Agency for International Development, from 04/2008-05/2011


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ISBN 978-92-5-130936-0

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CA1433EN/1/10.18