FEMALE VOICES FROM THE FIELD

Success Stories and Recommendations of and for Women's Empowerment in Agriculture

Compiled from the International and Transdisciplinary Conference

'Women's Empowerment in Agriculture'
25 – 27 June 2019, Dubai, UAE

organized by
the Arab-German Young Academy
of Sciences and Humanities (AGYA)

in cooperation with
the International Center for Biosaline Agriculture (ICBA) Dubai,
United Arab Emirates

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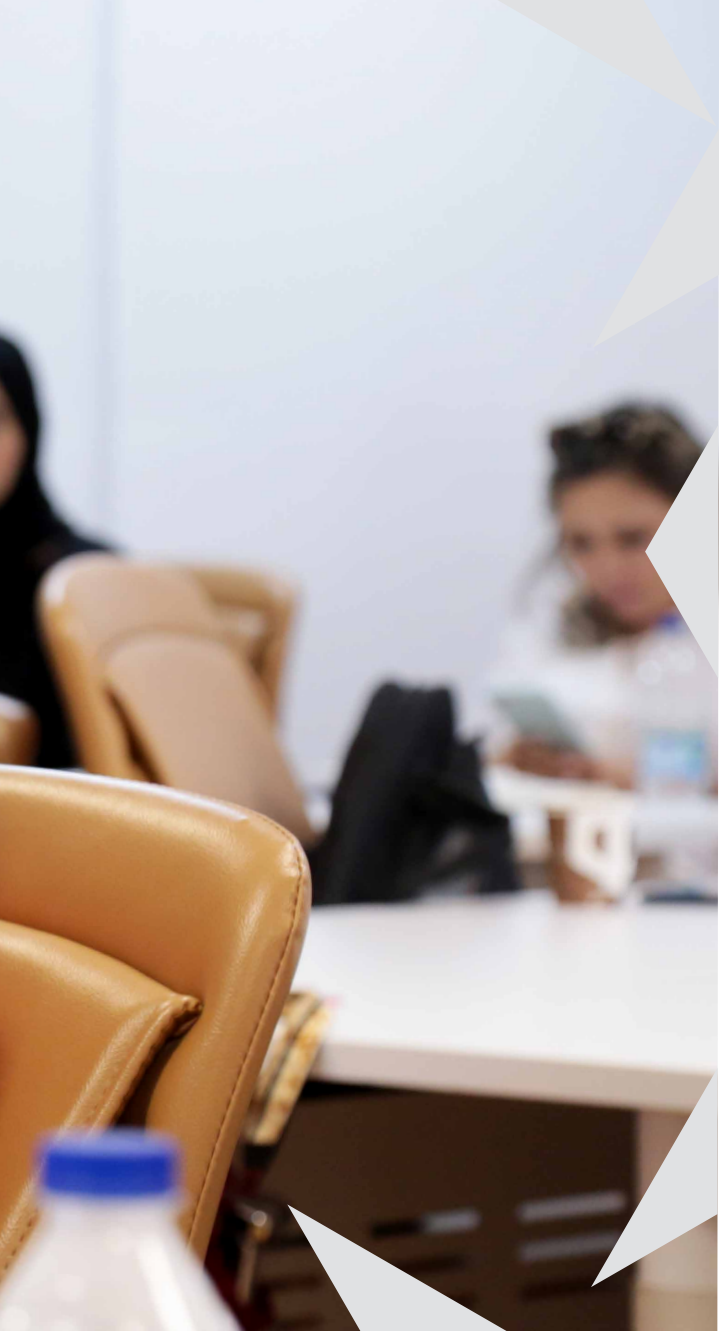

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Dr Henda Mahmoudi
AGYA Alumna, Biology,
International Center for Biosaline Agriculture,
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"Women are the backbone of rural economies, especially in developing countries. They make up almost half of the world's farmers. Over the last few decades, female farmers have broadened their involvement in agriculture. At the same time, many female farmers experience many disadvantages and discrimination compared to their male counterparts. Taking up a gender-transformative approach, this AGYA project aimed to improve agency while sharing collective capacities (knowledge and skills) towards the goal of transforming power dynamics and structures that reinforce gender inequalities. During the conference on 'Women's Empowerment in Agriculture', we engaged intercultural and transdisciplinary groups in critically challenging and questioning gender norms from very different perspectives."

INTRODUCTION

Implementing Gender Transformative Approaches to Agriculture

Nearly half of all farmers worldwide today are women. Although men still frequently outnumber women in agriculture-related positions in laboratories, legislatures and boardrooms, women's presence and contributions in these spaces continues to grow significantly. Over recent decades, gender-transformative approaches that are both attuned and responsive to challenges facing women in agriculture – whether structural, social or personal – have become mainstream in many parts of the world. **Yet, suprisingly few such initiatives have focused on the Arab world, where female farmers are increasingly becoming a considerable part of the agriculture work force.**

In response to this gap and in order to open lines of exchange between women in agriculture in the Arab world and other regions, AGYA alumni Dr Henda Mahmoudi and Dr Vanessa Lux organized an interdisciplinary conference on 'Women's Empowerment in Agriculture' in June 2019, in cooperation with the International Center for Biosaline Agriculture (ICBA) in Dubai. The conference sought to enhance the agency and influence of women engaged in agriculture in the Arab world – as farmers, researchers, engineers, entrepreneurs and policymakers – by facilitating cross-cultural knowledge exchange and networking with their counterparts from Germany and a range

Dr Vanessa Lux
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Germany

"In Germany, farming is still a family run business where traditional role models predominate. Only a small number of farms and agriculture companies are run by women. To support gender equality in agricultural landscapes, we need to foster self-empowerment networks, increase policy measures for better work- life balance, and ensure access to business-related services and business infrastructure for women. Women in agriculture are an important factor for the vitality of rural areas. This is the same in Germany and in Arab countries. To protect and further develop vital communities in rural areas we need to empower female farmers."

of countries from the Global South, such as Benin, Kenya, Kazakhstan and Nepal.

The benefits of the network forged at the conference flowed in multiple directions. Women in agriculture and other relevant stakeholders from ten Arab countries got to meet and swap experiences with each other, as well as tap into the wealth of knowledge and experience of those implementing gender transformative approaches to agriculture in different regions. Meanwhile, participants from other parts of the world had the chance to **learn about agricultural innovation in the Arab region, home to cutting-edge research on agriculture in marginal environments and, particularly in the Gulf states, leadership in agricultural extension services and government-backed support schemes.**

This brochure provides an overview conference report, recapping the activities and achievements of the three-day event in Dubai, as well as a summary of the recommendations generated by participants in the final conference session. The brochure's highlight, however, is the presentation of four 'success stories' of women in agriculture from the Arab world and Germany. The idea to publish such detailed profile stories of conference participants sprang from participants themselves following a particular conference session entitled 'Voices from the Field', in which women shared the unique perspectives, struggles and lessons learned from their work and experiences in various facets of agriculture. **Participants found the insight into other women's real-life experiences to be one of the most valuable, inspiring exchanges they had in this regard.** This brochure marks an important first step in achieving more exposure and wider circulation for women's powerful stories of success in agriculture.

AGYA Project Partners
Dr Henda Mahmoudi (Biology) & Dr Vanessa Lux (Genetic Psychology)

Project Type
International and Transdisciplinary Conference

Date & Venue
25 – 27 June 2019, Dubai/UAE

Cooperation Partner
International Center for Biosaline Agriculture (ICBA), Dubai/UAE

Project Goals
Establishing a Network for Exchange & Enhancing Women's Agency and Impact in Agriculture

Participants
More than 50 Agriculture Sector Stakeholders Including Farmers, Scientists and Policy-Makers from 16 Countries

Formats
Keynote Speeches, Panel Discussions, Design Thinking Workshop, World Café Sessions, Round Table Follow-Up

SUCCESS STORIES

of Women's Empowerment in Agriculture

Dr Ameena Al Tenaiji: A Role Model Farmer for Women's Empowerment in the United Arab Emirates

Dr Ameena Al Tenaiji is an ambitious small-scale farmer in the United Arab Emirates who designs and tests practical, inexpensive integrated farming systems combining agriculture and aquaculture to promote sustainable food production in harsh environments.

Dr Ameena Al Tenaiji is not a typical farmer. Until several years ago, she was not a farmer at all. With degrees in Geology and Environmental Earth Resources Management from Kuwait and the USA, respectively, she has led a prosperous 30-year career in strategic water policy and management in the UAE, working for a range of top-tier water and electricity entities, both public and private. In 2008, while still maintaining her career, she bought a small farm of her own and, as she puts it, became a 'farmer-by-choice'. In response to the notoriously

challenging weather and water conditions for farming in the UAE, she soon began to experiment with alternative techniques. Today, she is a pioneer in small-scale, integrated farming methods. **A motivated self-starter, she is a role model for women's empowerment in agriculture.**

PROMOTING WATER AND FOOD SECURITY IN HARSH ENVIRONMENTS

Farming in the UAE in not easy. The harsh sun, sand and scarce, high-salinity water present significant challenges. With limited natural water reserves, the UAE depends heavily on thermal desalination plants to make seawater potable. Most existing groundwater is highly saline and, after years of overdrawing reserves for agriculture and industry, natural recharge rates cannot keep up with demand. Ensuring water and food security under such challenging conditions requires innovative solutions. Over the course of her career in water policy and management, Dr Al Tenaiji has worked on several initiatives to develop water security strategies for Abu Dhabi Emirate, including pilot projects to improve and diversify agricultural water use to maximize sustainability and food security. On her own farm, she now runs a different kind of pilot project, experimenting with affordable, small-scale aquaponic systems.

RE-ORIENTING AGRICULTURE TOWARDS INTEGRATED METHODS IN THE FACE OF CLIMATE CHANGE

Integrated farming is a dynamic approach to farming that combines cutting-edge science and technology with traditional practices to identify, align and optimize synergies between local resources, conditions and nutritional demands for sustainability. By building custom integrated systems combining agriculture and aquaculture, farmers in the UAE have been able to drastically cut their water consumption, while increasing yields in comparison to conventional farms. 'Three years ago, I started to develop an aquaponic system because the water in my farm is very saline –17,000 ppm, which is almost like a sea water', says Al Tenaiji. 'So, I wanted to develop something to adapt to the situation'. Because it requires a fraction of the water needed in conventional farming, Al Tenaiji turned her attention to aquaponics.

PILOTING INNOVATIVE, AFFORDABLE AQUAPONIC SYSTEMS DESIGNED FOR SUSTAINABILITY

Common in integrated farming, aquaponics is a form of agriculture that combines raising fish in tanks (recirculating aquaculture) with soilless plant culture (hydroponics). **The nutrient-rich water from the fish waste serves as a natural fertilizer for the plants, while the plants help purify the water for the fish, eliminating the need for fertilizers, pesticides or herbicides.** Aquaponic systems are also easy to scale, capable of producing enough food for a family, a village or even a commercial enterprise. Importantly, 'you don't have to spend a lot of money to build a system', says Dr Al-Tenaiji. When first starting out,

she approached a company that builds aquaponic systems for the government and told them that she was interested in a small unit for her 1.4-hectare farm. Shocked when they quoted her an estimate of nearly 1 million dirhams (approximately 250,000 euros), she decided to take matters into her own hands:

> “I looked at the system and realized that it’s not so sophisticated and said, ok, I will do it myself.”

LEARNING BY DOING: ‘I EDUCATE MYSELF AND THEN MY STAFF’

Dr Al Tenaiji is a self-starter who does her research and then learns by doing. She started off by designing a simple circular system with a fish tank linked to filters and plant beds. Along with her three full-time employees and part-time monitoring manager, she built her system with simple, inexpensive components: a net house; a moulded fiberglass fish tank; a mechanical filter (four conical tanks); a bio-filter consisting of a glass tank with compartments filled with different bio-media (bio-balls); an air blower with different air diffusers; a water recirculation pump; and five ten-metre plant beds. For testing she uses an oxygen meter, a pH meter, a salinometer (for testing water salinity), an ammonia test kit and an air temperature thermometer. She and her team upload all their daily monitoring results into a custom database, which they use to analyse and adjust the system as needed. The International Center for Biosaline Agriculture (ICBA) in Dubai was so impressed with Dr Al Tenaiji’s initial self-developed pilot that they brought her an investor to help her build a big-

ger unit. For Dr Al Tenaiji, ICBA's encouragement and support has been just as important as their technical assistance. 'It's nice to feel that somebody's behind me', she says.

ASSESSING AND SHARING HER RESULTS

The harvest size and quality from Dr Al Tenaiji's aquaponic system has shown promise to date. 'Last season, when I started to actually use the system, I was amazed at the production' she says. As a test, she planted a variety of crops including lettuce, cucumbers, tomatoes, basil, mint and coriander, to observe the performance of each. Yields for most of the vegetables were far larger than that needed to feed her family, but not large enough to sell. As she continues to refine her methods, she hopes to publish academic journal articles to share her methodology and results. She recently completed her PhD from Brunel University in London on 'The Food–Water Dilemma of Agriculture in Arid Regions: Assessing Abu Dhabi Water Options for Domestic Agriculture' and is excited about the potential of systems like hers for food and water security in the region. **In the future, she hopes to gain organic certification and to experiment with building similar systems using hypersaline water to grow salt-tolerant plants like quinoa and halophytes.**

AGRICULTURE IN NUMBERS:
UNITED ARAB EMIRATES

- 3% of UAE's area is used for agriculture.
- 2% of the GDP is generated by agriculture.
- Dates are by far the most important agricultural product, accounting for about 80% of the cultivated area.
- In 2008, 100% of the labour force in agriculture were men.

Source:

FAO. 2008. AQUASTAT Country Profile – ARE. Food and Agriculture Organization of the United Nations (FAO). Rome, Italy *http://www.fao.org/nr/water/aquastat/countries_regions/are/ARE-CP_eng.pdf*

Anja Hradetzki: A 21st Century Cowgirl Mixing Time-Honoured Traditions and Bold New Ideas in Germany

Anja Hradetzky is a cowgirl, biodynamic farmer, educator, entrepreneur and writer who pairs agriculture with strong ecological ideals about sustainability, animal welfare and community renewal in Germany.

Germany is the world's third largest exporter of agricultural goods and the EU's biggest milk producer. While pastoral scenes of cows in green meadows are still widely used to market dairy products, they no long reflect reality on most German dairy farms. Radical changes over the last decades have seen family and mid-size farms give way to industrial agricultural behemoths. EU agricultural subsidies tied to land area disproportionately benefit large farms, promoting productivity over sustainable, healthy ecosystems. Bucking these trends, however, Anja Hradestzky and her husband Janusz run a small biodynamic dairy farm in Stolzenhagen, on the Oder river near the German-Polish border, where ecological ideals take precedence over profit margins. As someone who wears many professional hats – farmer, educator, entrepreneur and author – **Anja advances a powerful vision for sustainable agriculture, rural revival and community development that makes her a role model for women in agriculture everywhere.**

A DAIRY FARM DETERMINED TO DO THINGS DIFFERENTLY

At Hof Stolze Kuh (Proud Cow Farm), as their website proclaims front and centre,

> **"We do everything a little differently than normal and go to great lengths to show that doing things differently works. This path is not always easy, but it is incredibly fulfilling!"**

Founded in 2014 on 220 hectares of leased land in the Lower Oder Valley National Park in the German state of Brandenburg, Anja and her husband Janusz raise only endangered dual-use cattle breeds, good for both milk and meat, and grow all of the feed for the cattle on-site, prioritizing low-input, local heritage crop strains. As a Demeter-certified organic and biodynamic farm, they take a holistic approach to agriculture that treats soil fertility, plant growth and livestock care as ecologically interrelated. When it comes to agriculture, Anja believes strongly in getting back to basics: 'I don't want to use technology. We work like farmers did in the 1950s in Germany. By choice.'

LETTING COWS BE COWS

From the very beginning, Anja says, 'we ask: what are the cows' needs?' This begins from birth. In Germany and industrialized agriculture in Europe generally, 'the norm is to take the calves away from their mothers immediately after birth', Anja explains, allowing all of the mothers' milk to be sold. 'It's also normal to de-horn them and it's normal to inseminate them' she says. While these practices may be good for profits, they are certainly not good for the cows.

Proud Cow Farm takes a markedly different approach:

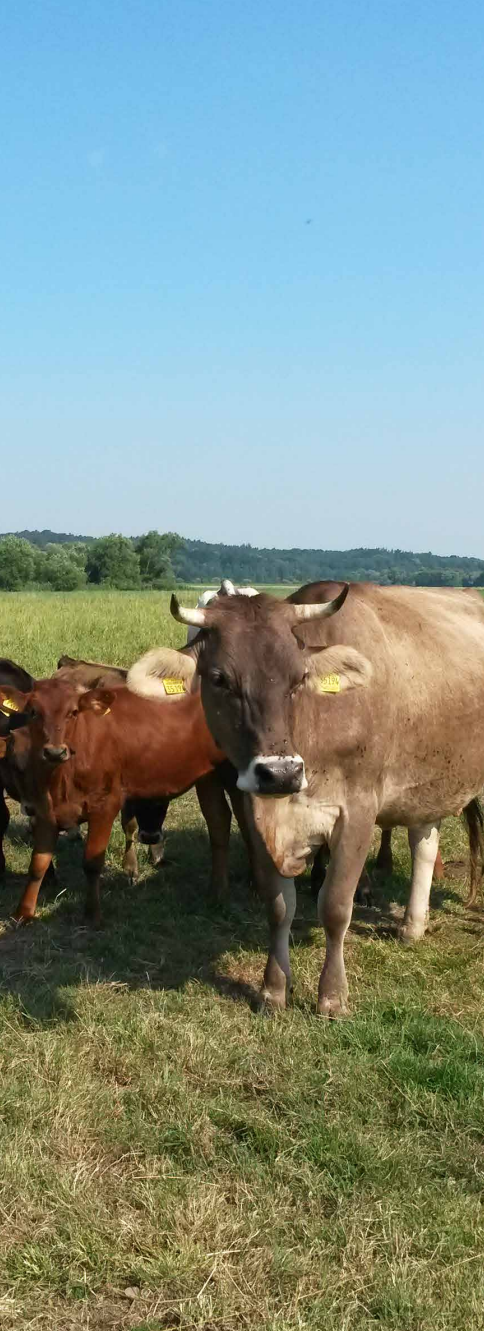
> “We just go back to the cow. The cow wants to be a mother, for example, and wants to graze.”

COW-BOUND CALF REARING

Hence, Anja practices something called cow-bound calf rearing, a method of raising calves with their mothers or nurse cows. Nursing from another cow until it’s time to wean fosters a positive symbiotic relationship between the calf and cow, and comes with immune system benefits that lead to healthier, stronger, more disease-resistant and resilient cows. ‘It is quite special that we do not raise our calves separately from the cows’, says Anja. Instead, new-borns suckle directly from their mother for a full week and ‘then we get two calves accustomed to one wet nurse’. This means that ‘a cow can keep her calf if she adopts another’, she explains. For the cows, this takes some patient encouragement with food and low-stress stockmanship techniques, and some are more naturally ‘motherly’ than others, but the benefits to the calves are well worth the effort. Once joined with a wet nurse, calves get to spend time outside in a herd rather than confined to a barn, where they learn important things like ‘social issues, how to eat grass, where the water trough is, that fences are limits, and how the sun feels on their fur’. According to Anja, ‘people think the calves don’t want to move, but in our experience, they really do.’ Anja reports that ‘after our first experiences, we can say that it works very well’.

TIME-HONORED TECHNIQUES FOR SUSTAINABLE, NON-INDUSTRIAL DAIRY AND BEEF

After around five months of cow-bound calf rearing, the calves are weaned and the ‘boys and girls’ go to pasture separately, where they grow for two and a half more years. Most of the bulls are eventually slaughtered, while the cows become dairy cows. This represents another stark difference with industrial dairy farms, where bull calves are typically sold 14 days after birth, destined for a short life on a tightly packed feed-



lot before being slaughtered as industrial meat. Even most Demeter dairy farms still sell their calves to industrial slaughterhouses. At Proud Cow Farm, however, when a bull reaches maturity, Anja takes pre-orders for the meat and makes an appointment with a small butcher in the neighbouring village, where there is no stress for the animals. They then deliver the meat, or sausages produced at the farm, directly to customers.

MILKING IN THE PASTURE AND LOW-STRESS STOCKMANSHIP

Also diverging from industrial farms, Anja milks the cows directly on the pasture with a portable milking parlour until winter sets in, when the cows then move to the barn. Milking directly on the pasture lets the cows roam free as much possible and 'it's breath-taking to see the sun rise while milking', says Anja with a twinkle in her eye, 'It makes you addicted!' Whether she's with the cows in the pasture or the barn, Anja utilizes low-stress stockmanship, a method she learned in Canada by which a person can steer and guide a herd through body language, position and movement patterns.

EDUCATION AND EMPOWERMENT TOWARDS COMMUNITY AND RURAL REVIVAL

In addition to using low-stress stockmanship techniques with her own cows, since 2012, Anja has worked as a freelance trainer, offering pasture visits and hands-on workshops to other farmers and interested parties. Where she is in Europe, she says, there are only two women, her and one other, training people in this method. For Anja, sharing her knowledge and engaging with others are important elements for individual and collective empowerment:

> **"In our public relations and education efforts, I want to let people look into the eyes of the animals again, to reconnect with the creatures that they eat and get their products from."**

To engage with other farmers, Anja also started a young farmers network where members council each other in lieu of state-provided counseling services, which are only available to large rather than small farms. Working together, they have found opportunities to get funded for running workshops on traditional farming techniques. They also advocate bold approaches for increasing young people's access to land, and share their innovative ideas for and experiments with new integrated farming techniques. In all of her endeavors, Anja embodies her farm's motto that doing things differently, though not easy, is well worth the effort.

READ MORE:
Anja Hradetzky (2019): How I Travelled the World as a Cowgirl and Became an Organic Farmer Without Land and Money. Dumont.
(In German)

AGRICULTURE IN NUMBERS:
GERMANY

- At 16.6 milion hectares, almost half of Germany's land area is used for agriculture
- In 2017, there were 248,200 farms with more than 5 hectares of utilized agricultural area.
- 1/2 of all farmers keep cattle to produce milk, meat, or both.
- 36% of the agricultural labour force are women, but only 10% of farms are run by women.

Sources:

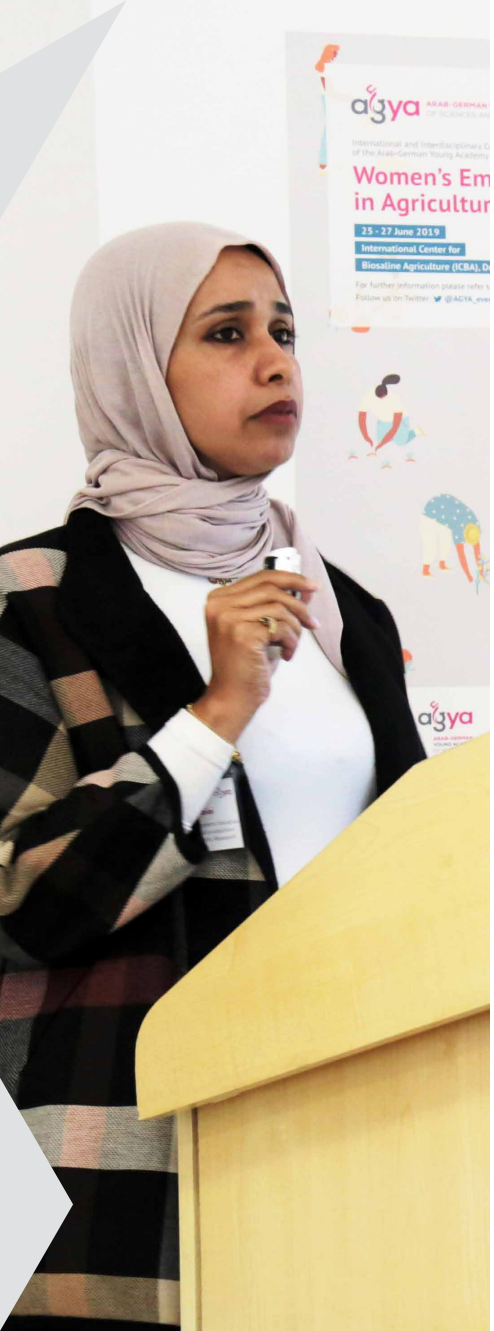
Bundesministerium für Ernährung und Landwirtschaft (BMEL) (2020) *https://www.bmel.de/DE/Landwirtschaft/Pflanzenbau/Ackerbau/ackerbau_node.html*

Deutscher Bauernverband (2020) *https://www.bauernverband.de/situationsbericht/3-agrarstruktur/33-betriebe-und-betriebsgroessen*

Bundesministerium für Ernährung und Landwirtschaft (BMEL) (2020) *https://www.bmel.de/DE/Tier/Nutztierhaltung/nutztierhaltung_node.html*

Bundesministerium für Ernährung und Landwirtschaft (BMEL) (2019) *https://www.bmel.de/SharedDocs/Downloads/DE/Broschueren/Landwirtschaft-verstehen.pdf?__blob=publicationFile&v=8*

“ I also started a young farmers network where we council each other because there’s no counseling for small-scale farms. Working together, we found opportunities to get funded for running workshops on traditional techniques. ”



Dr Sherain Al-Subiai: A Pioneering Researcher in Sustainable Aquaculture in Kuwait

Dr Sherain Al-Subiai specializes in aquaculture at the Kuwait Institute for Scientific Research, where she designs and tests shrimp farming systems for optimal commercial viability and environmental sustainability.

Women in agriculture are not only farmers, but also cutting-edge scientists. Dr Sherain Al-Subiai is a pioneering researcher in aquaculture, a subset of agriculture focused on the breeding, rearing and harvesting of fish, shellfish, algae and other organisms in various water environments. **As an Associate Research Scientist in Aquaculture at the Kuwait Institute for Scientific Research (KISR), she focuses on improving shrimp farming in line with Kuwait's Vision 2035, which aims promote food security and protect the country's wild shrimp stocks.** She is the first woman in Kuwait and one of few globally to break through in this traditionally male-dominated field. Her success story is an example of women's empowerment in action.

PROMOTING AQUACULTURE TO ADDRESS FOOD SECURITY

Humans' appetite for seafood has long outpaced what fishermen can catch sustainably, making aquaculture an important component of global food production. While only around five percent of the fish and shellfish humans ate in 1970 came from farms, today, more than 50 percent does. Due to Kuwait's growing population and rising demand for food production, KISR's Director General Samira Omar has identified aquaculture as 'one of the most crucial and fastest growing industries'. However, aquaculture in Kuwait is still in its early stages. KISR's aquaculture program began in 1983. After successfully building up a hatchery for seed production for several local species with encouraging results, it stopped its work for some time due to staff shortages. In 2015, KISR sought to revive its aquaculture research in response to a government initiative to develop commercial-scale aquaculture technology in line with the emphasis on food security articulated in Kuwait's New Vision 2035. They needed Kuwaiti scientists to lead this kind of project, for which Dr Al-Subiai says: 'I was lucky to be at the right place at the right time'.

Shrimp was selected as one of three species for KISR's pilot research in aquaculture based on market analysis and demand. According to Dr Al-Subiai, shrimp is the second-most preferred seafood in Kuwait, where it remains relatively affordable rather than a luxury item. Yet, every year Kuwait imports nearly double the amount of shrimp that it catches locally. Around the world, 80-90% of the shrimp consumed as food is farmed through aquaculture rather than caught at sea. In terms of environmental impact, both farm-raised and wild-caught shrimp can damage surrounding ecosystems. In the wild, shrimp are usually caught by trawling, which can damage ocean floors and result in high rates of by-catch, when other species are also caught in the fishing nets. Major challenges of farm-raised shrimp, in contrast, include disease, pollution and escape. For commercial purposes, shrimp have the added benefit of relatively short production time. Compared to fin-fish for example, which usually take a minimum of two years to culture before getting the first market-ready crop, shrimp has a much faster turnaround, meaning farmers can begin to earn profits in the very first year of production.

HARNESSING BIOFLOC TECHNOLOGY TO OPTIMIZE SHRIMP AQUACULTURE FOR KUWAIT'S HARSH CLIMATE

Outdoor pond systems are the norm in shrimp farming, but they are ill-suited to Kuwait's harsh climate. At KISR, Dr Al-Subiai has pioneered research on an indoor, closed-system raceway design for high-density shrimp farming that utilizes biofloc technology to regulate water quality and provide additional nutrition for the shrimp, both cutting costs and increasing biosecurity.

As Dr Al-Subiai explains:

> **"We feed the shrimp, the shrimp eats the feed and, after that, we introduce a bacteria that interacts with the waste of the shrimp, converting it from potentially toxic ammonia into protein, called flocs."**

These 'bioflocs' are aggregates (flocs) of bacteria, micro algae, protozoa and other small kinds of particulate organic matter that then serve as an additional source of feed for the shrimp, meaning less feed is needed at the outset, significantly reducing total production costs. In addition to saving money over conventional aqua-culture methods, biofloc technology also helps reduce health risks, both for the shrimp and the broader environment. By using biofloc technology, says Dr Al-Subiai, 'you can control the climate and water quality, avoid the use of antibiotics and chemicals, and work all year around, meaning you can have three crops instead of just one crop'.

So far, Dr Al-Subiai and her team have worked on optimizing shrimp biofloc aquaculture for the Litopenaeus vannamei species, the most commercially farmed species in the world. Their experiments have produced successful results using both sea water and brackish water to date, making shrimp cultivation through biofloc technology in closed, indoor systems a promising investment for small to medium-scale farmers as well as large-scale commercial enterprises in Kuwait. The nutritional profile of the shrimp produced with biofloc technology has proven equivalent to that produced by conventional methods and participants in a blind taste test could not tell the difference, agreeing with Dr Al-Subiai that 'the taste

is delicious!'. Going forward, Dr Al-Subiai hopes to experiment with using brine wastewater from Kuwait's desalinization plants for shrimp aquaculture. As most of the country's fresh water is produced through de-salinization, being able to use the wastewater for shrimp farming would mean not having to divert a valuable natural resource for shrimp farming, while also minimizing the impact of discharging the waste from desalination plants into the environment.

SUCCESS RARELY COMES IN THE FORM OF A STRAIGHT PATH

Dr Al-Subiai's path to success in aquaculture was far from preordained. After completing her Bachelor's degree in biochemistry and chemistry from Kuwait University, she joined KISR as a Research Assistant in the Environment and Life Sciences programme. After two years in that role, she earned a scholarship to do her Master's and PhD in Aquatic Toxicology at the University of Plymouth, UK. When she finished, she returned to KISR as an Assistant Research Scientist, but only stayed for one year before leaving again, this time for a post-doc position at MIT. It was not until she re-joined KISR as a Research Scientist after her post-doc that, thanks to a bit of luck, she finally landed in Aquaculture, the field she now views as her destiny. Although she excelled in Aquatic Toxicology, 'I still didn't find myself in this field', she recalls, 'the best position of my life was when I moved to aquaculture finally, and that was only four years ago'.

BREAKING THROUGH AS A WOMAN IN AN AREA OF AGRICULTURE AND RESEARCH DOMINATED BY MEN

'The field of aquaculture in Kuwait is dominated by men', says Dr Al-Subiai. Few women have traditionally gravitated toward the profession, most likely due to the fact that aquaculture systems require round-the-clock monitoring to check the water quality, feed and behaviour of the shrimp, with farms often set up in remote areas with harsh conditions. Early in her tenure in KISR's aquaculture programme, Dr Al-Subiai remembers an external consultant hired by KISR for a particular project sent in a request for supplies to the programme

AGRICULTURE IN NUMBERS:
KUWAIT

- About 1% of the economically active population in Kuwait work in agriculture.
- Animal production accounts for about 67% of Kuwait's total agricultural GDP, while crop production accounts for 23% and fisheries account for 10%.
- Crop cultivation in Kuwait depends 100% on artificial irrigation.
- In 2008, 100% of all labour forces in agriculture were men.

Sources:

FAO. 2008. AQUASTAT Country Profile – Kuwait. Food and Agriculture Organization of the United Nations (FAO). Rome, Italy *http://www.fao.org/nr/water/aquastat/countries_regions/kwt/KWT-CP_eng.pdf*

FAO. 2008. AQUASTAT Country Profile – Kuwait. Food and Agriculture Organization of the United Nations (FAO). Rome, Italy *http://www.fao.org/3/ca0343en/CA0343EN.pdf*

manager, in which he specifically asked for a male technician and researcher. 'This really triggered me and made me more committed to take on the challenge', says Dr Al-Subiai, and 'luckily for me, there was no man available, so they agreed to let me try it'.

To this day, Dr Al-Subiai keeps a picture of the consultant's request along with a picture from the project in which she stands out as 'the only woman among men'. Because she was a woman, she says, 'they didn't expect much from me, so I was not under much pressure, but I took it as a personal challenge'. Indeed, her general approach has been to work her way up from the bottom by embracing difficult fieldwork and never shying away from challenging tasks. Instead, she views everything as a learning opportunity. In turn, she says 'the men I've worked with have always been very supportive, I always feel respect from them. When you are confident and they feel that you know what you are doing, they really trust you and support you'.

As a scientist in a new field, Dr Al-Subiai spent an initial period traveling to learn about shrimp aquaculture in other country contexts. The most advanced work in the field is happening in Asia, so she visited, Korea, Tawain, Thailand and Saudi Arabia. 'I learned about different practices', she says, 'because, at the end of the day, you have to choose what's suitable for your environment'. After her return to Kuwait, she trained KISR staff in what she had learned, with whom she has since organized six training courses for private farmers and additional KISR staff members. She has also found it valuable to invest time and effort in training others, as it allows her to see how others work and to build networks with decision-makers. After organizing an outreach activity around a shrimp release to raise awareness and deliver a good message for the community that was attended by three government ministers, 'many doors started to open and we've been able to break down previous obstacles,' she says.

WOMEN'S EMPOWERMENT IN AGRICULTURE REQUIRES SOLID SUPPORT STRUCTURES AND PAYING IT FORWARD

In Dr. Al-Subiai's assessment:

> "Building a successful woman scientist requires a good research environment and a strong support network."

Although strong support networks can take many shapes, for her, this role has undoubtedly been filled by her family. Having become a mother of five children in parallel to her academic and career milestones, she notes, 'I couldn't have done all that I've done without the support of my husband, my dad, my family'. In addition to always sharing what she does at work with her children, she also serves as a role model for children everywhere of what a successful woman in agricultural sciences looks like. In addition to strong support structures, successful women scientists 'also need opportunities,' she says:

> "I think in Kuwait we are lucky. Women are quite empowered, and we have good opportunities. However, we currently lack leadership tools."

In order to compete with men, she says, 'we need to know how to communicate, how to lead and manage teams, how to negotiate – all of these are skills that I plan to practice more'. They are also skills that Dr Subiai is now in a position to build with and pass on to other women in science and agriculture. 'When I started, I was the only woman in the field,' she notes, 'but today, we are four women scientists working in aquaculture at KISR. I encourage young women to join the staff and, in the future, I plan to increase my interaction with Kuwait University, which currently lacks a specialization in aquaculture. It would be a new field in Kuwait and a good opportunity for women scientists to join in, with lots of career promise'.

Hafidah El Falahi: A Farmer and Founder of a Trailblazing Agricultural Cooperative for Women in Morocco

Hafida El Falahi is the general secretary of the Third Millennium Cooperative in rural Morocco, which employs and empowers women through the production, marketing and selling of diverse food products made from local agricultural outputs.

Hafidah El Falahi exudes the humble, confident, and unmistakable air of a community leader. From the small rural town of Bourrous in Rehamna Province, about a half-hour's drive outside of Marrakesh, El Falahi can effortlessly command a room, making each person in it feel seen, heard and validated. In 2008, El Falahi traded her office job to strike out on her own with a bold idea. Together with three other women, she started a small cooperative to make food products from local ingredients that has since grown into a thriving business employing 40 women from nearby villages, giving them the financial means to support their families. Today, El Falahi serves as the general secretary of the Third Millennium Cooperative (Coopérative du 3ème Millénaire) and has helped establish 19 similar cooperatives across Morocco. Her journey from rural community member to cooperative matriarch is a compelling success story of women's empowerment in and through agriculture.

FROM ADVERSITY TO INDEPENDENCE: FINANCIALLY EMPOWERING WOMEN THROUGH COOPERATIVES

A decade ago, the small town of Bourrous was plagued by high unemployment, drug addiction and general deprivation. Rather than paralyzing El Falahi, these challenges spurred her into action. As she explains:

> "Our cooperative was created in a rural area suffering from poverty and drought, to gather poor women from the area and give them jobs."

El Falahi focused her efforts on women in recognition of the many gender-specific forms of adversity they face in rural Moroccan society, where women may not even be allowed to leave their homes. For women who have lost their husbands, either to death or divorce, and still have children to care for, the lack of financial independence can be devastating. From this starting point of extreme adversity, **El Falahi created the cooperative as a means to leverage women's existing agricultural and productive know-how into a source of financial autonomy.** Starting with only four women, they began to produce traditional value-added food products like couscous from local crops including wheat, rice, maize and cactus. They also recruited and trained other women from surrounding villages. As El Falahi notes, 'All of the women have different stories, but a common purpose: to make a living for themselves, provide for their families, and lift up more women in their communities through education and employment'.

MAKING COUSCOUS FROM QUINOA: A TWIST ON A CULTURAL CLASSIC

A locally grown cactus variety used to be a staple ingredient in many of the Third Millenium Cooperative's products. When a cochineal insect infestation ravaged the local cactus crop, however, El Falahi and the women at the cooperative had to get creative. In 2009, the Dubai-based International Center for Biosaline Agriculture (ICBA) reached out to El Falahi's co-op to see if they would be interested in participating in its Rehamna quinoa project, which sought to introduce the best-performing quinoa genotypes from the Center's years of research into the province's agricultural landscape. **Often referred to as a superfood, quinoa is not only highly nutritious, but also exceptionally stress-tolerant and thus ideal for growing in marginal soil and climatic environments like Bourrous, characterized by persistent drought.** Quinoa had first been introduced in Morocco in 2000, but for a number of reasons, never caught on. With support from ICBA, however, El Falahi and many other women from the cooperative began growing quinoa on their farms and incorporating it into their food products. Contrary to common assumptions, Morocco's most famous dish – couscous – is rarely made from a single grain.

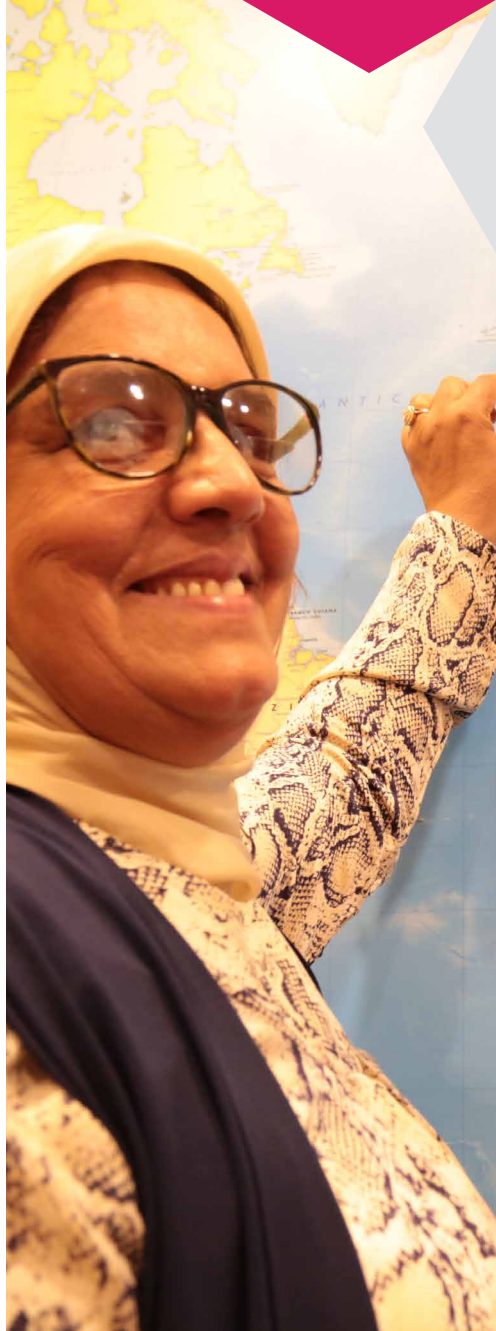
Today, El Falahi says:

> "We are producing 32 types of traditional couscous from millet, jujube, cactus, maize and other crops, including quinoa."

Popular with Morocco's royal family, the co-op's quinoa couscous is not only gluten-free but contains all eight essential amino acids and diverse micronutrients, packing twice as much protein as maize, barley or wheat. Since adding quinoa to their products, the co-op's profits have increased significantly.

MORE THAN JUST A JOB: CREATING ENTREPRENEURS AND CONNECTING WITH DIVERSE PARTNERS

To get their products from the co-op in Bourrous to market, the women of the Third Millenium Cooperative had to be more than excellent farmers and producers; they also had to become well-rounded entrepreneurs. While



El Falahi is a singular force of nature, she readily admits that networking and cultivating external partnerships for technical support and financial backing has been key to the co-op's success to date. Beyond providing seeds, equipment and training in quinoa production and processing, for instance, ICBA also provided the co-operative with crucial entrepreneurial support. 'We were making high-quality products, but we weren't able to sell them because we didn't have the knowledge or tools to get them certified,' says El Falahi. ICBA helped guide the women through the certification process, offered key marketing advice and facilitated the women's participation in fairs and exhibitions, ultimately helping to get their products onto supermarket shelves and in the fair-trade circuit. The co-op has since sought out partnerships and funding from diverse sources, including the National Federation of Milling, the National Initiative for Human Development, the Green Morocco Plan, Promotion Nationale, the Mohammed V Foundation for Solidarity, Etoile France Association and the German Embassy in Morocco.

SNOWBALLING WOMEN'S SUCCESSES

In addition to providing the women of Bourrous and surrounding villages a degree of financial independence, El Falahi's holistic approach to women's empowerment also includes a focus on education. Since founding the co-op, she has helped 30 women with the financial and moral support needed to earn their degrees. For many women, educational, training and marketing opportunities within the framework of the cooperative have also afforded them unimagined mobility, taking them around the region and sometimes even abroad. El Falahi sees each woman empowered through involvement with the co-op as an opportunity to empower many more people: women, men, children, families and entire communities. Another way she ensures that the success of her initiative in Bourrous continues to snowball is by supporting women in other areas who wish to set up cooperatives of their own. **To date, she has helped establish 19 similar cooperatives across the country, with whom she continues to communicate and champions in whatever ways she can.**

AGRICULTURE IN NUMBERS:
MOROCCO

- The agricultural sector contributes 15% to Morocco's GDP, accounting for 39% of the workforce.
- Women account for 5% of the total number of cultivators in Morocco and own 3% of the land.
- 52% of working women in Morocco work in the agricultural sector.
- The country's main agricultural products are wheat, sugar beet, and barley.

Sources:

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CONFERENCE REPORT

Women as Change Agents in Agriculture

AGYA's June 2019 conference on 'Women's Empowerment in Agriculture' brought together farmers, scientists and policy-makers from 16 countries spanning Germany, the Arab world (Algeria, Egypt, Jordan, Kuwait, Morocco, Oman, Palestine, Sudan, Tunisia, UAE) and beyond (Benin, Italy, Kazakhstan, Kenya, Nepal) for bottom-up networking and interdisciplinary North-South-South knowledge exchange.

Over the course of the three-day event, a diverse array of speeches, panel discussions and working group activities outlined the current state of knowledge and diverse practices related to women's empowerment in agriculture in the Arab world as compared to other regions. On the first day, **Dr Malika Martini (Food and Agriculture Organization of the United Nations, FAO)** introduced participants to the Women's Empowerment in Agriculture Index (WEAI) and discussed the potential for gender transformative approaches to agriculture in the Arab region. According to Martini, empowering women in agriculture entails understanding contextual factors limiting women's agency in five domains: decisions about agricultural production; access to and decision-making power over productive resources; control over use of income; leadership in the community; and time use. Change is thus necessarily an iterative rather than linear process requiring multi-disciplinary engagement and diverse tailored initiatives. 'We must ask ourselves who defines what transformative change means,' she urged. She continues:

> **"We should not think that by providing projects and programmes, we are empowering women. Rather, we are providing the opportunity to achieve empowerment."**

Various panelists on the first day offered examples of concrete challenges faced by women in the Arab world and Germany, as well as opportunities and future visions for change. **Setta Tutunndjian from ICBA (UAE)** noted, for example, that in the Arab world, less than 5% of agricultural extension services – that is, capacity building for farmers in applying scientific research and new knowledge in agriculture and marketing – are designed for women. She pointed to the recent hiring of four young women in extension services in the UAE, all of whom were present at the conference, as a hopeful model for making extension services more responsive to and inclusive of women. Other concrete examples of improving women's access to information, training, technology and networking also offered promising ways forward. Farmers' Field Schools established by FAO and implemented by ICBA in countries including Egypt, Jordan, Oman, Syria and Yemen were

an example cited from the Arab world, while Ireland's establishment of rural Knowledge Transfer Groups was cited from the European side.

In perhaps the most inspiring session of the conference entitled 'Voices from the Field', participating farmers shared and discussed their agricultural success stories. **Farmers Dr Ameena Al Tenaiji and Abdul Rahman Al Shamsi from the UAE** shared their impressive experiences in combining cutting-edge science in aquaponics and integrated farming techniques to create synergies with their local resources and conditions. Other exciting examples in aquaponics and integrated farming came from Kuwait and Benin, while farmers from Kazakhstan, Morocco and Nepal shared success stories of women in seed production, the creation of cooperatives, and joint initiatives linking farmers and researchers. From Germany, **farmer Anja Hradetzky** described her success in reviving traditional farming methods and shared how a self-organized support group for young farmers has been key not only for women's empowerment, but also reinvigorating people's relationship to the land and animals they rely on for sustenance.

The conference also included a trans-disciplinary training day dedicated to 'Positive Design Thinking' that offered new perspectives and tools for addressing challenges and supporting women in agriculture. In two 'World Café' seminars, participants thought through women's different roles as researchers, rural family members and in relation to extension services, as well as different facets of cultivating assertiveness. At the end, participants brainstormed recommendations for the future.

All left energized and inspired for further exchange on how to support and empower women as innovators and change agents in agriculture. Of course, the perspective of men supporting female farmers has also been heard. As an example, **Kuamivi Olivier Zaga - a role model farmer from Benin** and a strong supporter of women empowerment in agriculture - says:

> **"There is no future without agriculture and there is no agriculture without women."**

RECOMMENDATIONS

Enhancing Women's Agency and Influence in Agriculture

Within the framework of the international and transdisciplinary AGYA conference entitled 'Women's Empowerment in Agriculture', held in collaboration with the International Center for Biosaline Agriculture in Dubai, more than 50 agriculture sector stakeholders including farmers, scientists and policy-makers from 16 countries came together for bottom-up networking, brainstorming and North-South-South exchange. Farmers and stakeholders from Germany and Europe knew incredibly little about their Arab counterparts and vice versa. **Thus, the exchange was all the more inspiring and fruitful.**

From the conference's keynote speeches, panel discussions, and 'World Café' seminar sessions, the following recommendations were formulated regarding **how to further enhance women's agency and influence in agriculture in the Arab world and Germany:**

R1

Create a stable umbrella networking structure for regular meetings and joint working groups bringing together female farmers from Arab countries and Europe for North-South-South collaboration.

No network currently exists to regularly gather key agricultural stakeholders from the Arab world and Europe for regular and varied types of exchange. Building off the successful experience at the conference, participants unanimously agreed that the lines of exchange initiated at the conference should be continued, formalized and expanded. While this could involve the creation of a new institutional structure for this purpose, participants also suggested that a regionally active institution like ICBA might also play this structural mediating role. The most important factor is to **establish a format for continuity and growth in the type of exchange experienced at the conference.** In addition to facilitating annual or biannual meetings of the entire network, participants envisioned the establishment of specialized working groups within this network, with different thematic, sectoral or regional areas of focus.

The permanent networking body should:

- Serve as a locus and central contact point for all stakeholders interested in women's empowerment in agriculture in and between the Arab world and Europe.
- Create specialized 'hubs' for innovation between farmers, scientists, industry and policy actors that adequately attend to and incorporate women's dynamic role in agriculture.
- Serve as a springboard and perhaps funding body for mobility grants and small exchange projects for ideas and initiatives generated through the network's activities.
- Establish formats for farmer-to-farmer and researcher-to-researcher exchange,

as well as mixed farmer-researcher-industry-policymaker exchange formats.

- Facilitate structured interaction with relevant decision-makers to discuss and ensure progress on proactive gender mainstreaming in agricultural policy contexts.
- Serve as the central collection and dissemination point for various types of documentation and publications, including monitoring, evaluation, lessons-learned, success stories, strategies and policy papers.
- Include more countries for beneficial North-South-South cooperation.
- Connect women in agriculture with women in other sectors for learning and exchange.

R2

Establish opportunities for technical knowledge exchange, training and showcasing real farming and research scenarios for and/or between women in agriculture.

In response to the sharing of working methods, lessons learned and success stories at the conference, participants expressed a desire to take the conversation out of the conference hall and continue the **exchange through practical, hands-on visits to each other's farms, laboratories and cooperatives.** Structured opportunities for technical knowledge exchange, training and showcasing real farming, research and marketing scenarios should be established based on the needs assessed within the network. They would serve both to build capacity and spur cross-pollination of ideas for innovation. These exchange visits should prioritize women's empowerment, but in no way should they be limited to only women. Effectively integrating men and communities into women's empowerment is key, all agreed, to its ultimate success.

R3

Boost women's role in agriculture-focused scientific research and better bridge academic researchers and farmers for women's empowerment.

More women should be encouraged to enroll in and contribute to scientific fields related to agriculture. ICBA's AWLA fellowship for empowering women researchers in agriculture is a promising format in this regard, but additional efforts should also be made to link women researchers in agriculture to practitioners, namely farmers. The work and experiences of farmers and scientists is often incredibly relevant for each other. Too often, however, these different agricultural actors remain in their own separate spheres. **Therefore, mechanisms should be established for regular exchange between women farmers and academic researchers to facilitate the sharing of experiences, priorities and objectives related to their work and women's empowerment.**

R4

Improve agricultural extension services by learning from best-practice examples and exchange.

Agricultural extension services refer to a set of services often funded by local or national government agencies for providing farmers with up-to-date information and capacity building in applicable scientific research and development relevant for agriculture, including marketing. In the Arab world, agricultural extension services are frequently well-developed and well-funded, but are less often consciously designed for women. Recent efforts to hire young women in agricultural extension services in the UAE present a hopeful model for making extension services more responsive to and inclusive of women. In Germany, government-funded 'counselling' for farmers, the closest public equivalent to agricultural extension services, are only available for large industrial farms, leaving small to medium-scale farmers left to pay for private services or self-organize their own support and capacity building networks. The latter option, in particular, has picked up traction among small-scale farmers focused on rural revival and sustainable ecological approaches to agriculture. The **best practices from extension services in the Arab world and Germany, particularly those targeting and taking gender-specific challenges and goals into account, should be gathered, synthesized and shared between farmers and extension service agencies and networks in the Arab world and Germany.** In formulating ways to improve agricultural extension services in the Arab world and Germany, best-practice models like FAO Farmers' Field Schools and Irish Knowledge Transfer Groups should also be considered. Increasing women's role in extension service agencies will be very important for reaching rural women, as will be the integration of mobile technologies for reaching farmers in remote communities.

R5

Increase the acknowledgment of female farmers by educational initiatives and campaigns and, therefore, facilitate positive change in behaviour, attitudes, and societal norms around women in agriculture.

Participants repeatedly cited attitudes, behaviours and entrenched societal norms as a challenge preventing women's full empowerment in agriculture. For instance, in rural areas in the Arab world, participants cited numerous ways in which women play dynamic roles in agricultural production, development

and marketing. However, they also cited myriad examples of how women's work in agriculture remains subordinated to men's, in terms of its perceived importance, formal acknowledgement by men and society, monetary compensation and potential to influence policy. **Changing mindsets and entrenched social norms requires education for women as well as men and communities.** For women, efforts should be made to improve general educational attainment, as it often remains disproportionately low for women as compared to men, particularly in rural areas in the Arab region. This will contribute to empowering women in multiple spheres of life, those related to agriculture and otherwise. **Both in the Arab world and Germany, training opportunities should be devised for women, tailored to their local contexts and circumstances, to boost social skills like assertiveness, confidence, communication and other forms of personal self-empowerment. Concrete skills training should also be made more readily available for women in relation to leadership, management, negotiation and business practices. Mentoring networks tailored to the work-life of women in agriculture in and between the two regions should be set up.** With regards to men and communities, gender should be mainstreamed into all general education curricula. Men should be integrated into discussions and efforts to achieve women's empowerment in agriculture, including in farming, research, industry and policymaking. Targeted educational campaigns should also be launched to address local practices, traditions and customs that hinder women's empowerment in agriculture and society, tailored to local contexts, both rural and urban.

R6

Improve women's access to funding and financing for education, training, research and business initiatives connected to agriculture.

Women often juggle many roles, do more work and are paid significantly less than their male counterparts in many areas of agriculture. While completing their education, for instance, they may have less mobility or different time management considerations given gendered societal expectations around women's roles in the family. **Part of improving women's access to funding is also therefore making the conditions of funding opportunities more flexible and responsive to women's gender-specific needs and roles.** Moreover, funding opportunities are often limited by age, excluding applicants over 40. For women who may have taken time out for raising children or other familial duties, these age limits can be disproportionately damaging. More funding schemes for women at both ends of the age spectrum, old and young, should be developed.

R7

Measure, evaluate, publish and disseminate information on women's empowerment in agriculture in the Arab world and Germany.

A wealth of knowledge related to women's experiences and initiatives designed to boost women's empowerment in agriculture in the Arab region and Germany exists, but little of it has been systematically collected or written down to date.

Monitoring and evaluation, for instance, is key for understanding the impact of current practices in agriculture from a gender perspective and essential for learning lessons in order to design strategies for continuing to improve women's engagement, empowerment and agency in the agriculture sector. **Understanding and communicating the real challenges and contributions of women in agriculture will require more baseline studies, needs assessments, monitoring and evaluation reports, summaries of exchange events, lessons-learned and success stories.** Moreover, documenting processes, producing gender-disaggregated data and robust gender analyses will aid effective policy development. To make this a reality, budgets for conducting, publishing and disseminating such studies and publications should be incorporated into all projects at the planning phase, and separate funding lines for such knowledge production and dissemination should also be sought out or established.

About AGYA

The Arab-German Young Academy of Sciences and Humanities (AGYA) is based at the Berlin-Brandenburg Academy of Sciences and Humanities (BBAW) and at the Academy of Scientific Research & Technology (ASRT) in Egypt. It was established in 2013 as the first bilateral young academy worldwide. AGYA promotes research cooperation among outstanding early-career researchers (3–10 years after PhD) from all disciplines who are affiliated with a research institution in Germany or any Arab country (Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen).

The academy offers its members support and funding for their innovative research projects and collaborative initiatives in all fields of research, as well as in science policy and capacity building. Currently, more than 50 members jointly work on research topics such as the agricultural and medical potential of the date palm tree, crop genomics in the face of climate change, or the history of agriculture in the Mediterranean region. Moreover, AGYA fosters the intercultural experiences of its members and promotes them as ambassadors of science and culture. The academy's aim is to serve as a cross-cultural think tank, promoting and supporting Arab-German research exchange and North–South–South cooperation.

AGYA is funded by the German Federal Ministry of Education and Research (BMBF) and various Arab cooperation partners.

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About ICBA

The International Center for Biosaline Agriculture (ICBA) is a unique applied agricultural research center based in Dubai, United Arab Emirates, with a focus on marginal environments, where an estimated 1.7 billion people live. The Center identifies, tests, and introduces resource-efficient, climate-smart crops and technologies that are best suited to different regions affected by salinity, water scarcity and drought. Throughout its work, ICBA helps to improve food security and livelihoods for some of the poorest rural communities around the world.

ICBA's projects take place in many countries around the world, including those in the Gulf Cooperation Council region, the Middle East and North Africa region, Central Asia and the Caucasus, South and South East Asia, as well as Sub-Saharan Africa.

ICBA's current work contributes to several Sustainable Development Goals (SDGs) including: No Poverty (SDG 1), Zero Hunger (SDG 2), Gender Equality (SDG 5), Clean Water and Sanitation (SDG 6), Climate Action (SDG 13), Life on Land (SDG 15) and Global Partnership for Sustainable Development (SDG 17).

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