



# **Bumper Harvests and Record Wheat Production Propelling Sudan Towards Wheat Self-sufficiency**

# 1. Wheat production, supply and demand

Sudan's population of around 42.8 million people is projected to reach 49.4 million by 2025. With wheat consumption per capita at 65 kg (likely to increase), the current national consumption of 2.8 million metric tonnes (MT) in 2019 will soon hit 3.2 million MT (Table 1). Sudan continues to meet its increased domestic demand through expensive imports, but this is unsustainable.

From 2012/2013 the Support to Agricultural Research for Development of Strategic Crops (SARD-SC) wheat project and more recently the Technologies for African Agriculture Transformation (TAAT) project, became game-changers in the wheat sector in the country. Both projects are under the African Development Bank (AfDB) initiatives that focus on major staple crops and are aimed at transforming African agriculture towards meeting self-sufficiency.

The TWC employed the Innovation Platform (IP) as an effective approach for scaling up proven wheat technologies and for linking farmers to input and output markets. The IP framework both at strategic and operational level provides an excellent forum to bring all wheat value chain actors together for defining the roles and responsibilities and stimulating multi-stakeholder interactions and devising sustainable solutions for generation of innovation and impact at scale along the value chain. Led by ICARDA, the TAAT Wheat Compact (TWC) shows significant achievements in production area expansion, individual farm productivity and production, providing employment opportunities, and improving farmer incomes and quality of life. Such

accomplishments were not possible without strong commitment and support from the Government of Sudan who established the Supreme Committee for Wheat Self-sufficiency to oversee this national agenda.

## 2. A dramatic increase in production and employment

In 2014/15, the wheat production area in Sudan was 224,700 ha and at a productivity level of 2.1 tons ha<sup>-1</sup> producing 472,000 tons, a self-sufficiency ratio of 28%. By 2018/19, wheat was cultivated on a total area of 294,000 ha and at an average productivity level of 3.1 tonnes ha<sup>-1</sup> producing about 900,000 tons of grain, a self-sufficiency of 45%. A bumper harvest and record production was achieved in the 2019/20 crop season and an area of 315,500 ha was harvested with a total wheat production of 1.15 million tons. This was the highest production level ever in the history of wheat production in Sudan, with a self-sufficiency ratio of almost 50%. Average national wheat productivity reached 3.5 tons ha<sup>-1</sup> whereas at Innovation Platforms it was 3.8 tons ha<sup>-1</sup>. The increased area coverage, production and productivity were remarkable achievements resulting from strong partnerships, support and dedication from all stakeholders not least of all the farming communities themselves.

Since the start of TWC in 2018 about 76,000 (42% youth and women) additional jobs have also been created in wheat farming and support services and 39,000 beneficiaries (42% youth and women) were directly reached through project activities, plus tens of thousands of more people through access to certified seed of

**Table 1. Projected population growth and consumption at a constant level.**

	2019	2020	2021	2022	2023	2024	2025
<b>Population projection (million)</b>	42.8	43.8	44.9	45.9	47.9	48.2	49.3
<b>Estimated consumption (tonnes/Million) *</b>	2.78	2.85	2.91	2.98	3.11	3.13	3.20

Note: \*Wheat consumption at a constant 65 kg per capita.



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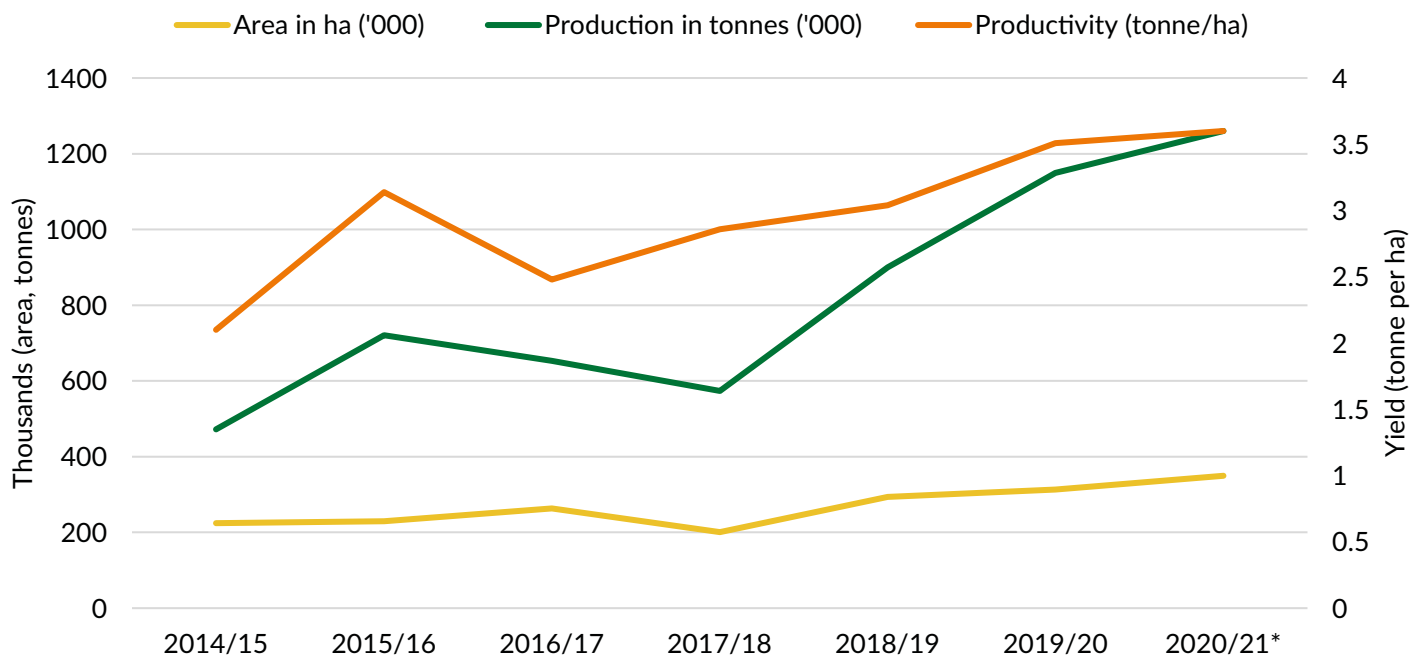
improved heat tolerant varieties, field days, travelling workshops word of mouth, etc. Moreover, through an innovative ICT-based technology episode, more than 3,240,000 views have been recorded through the YouTube channel accessing online video trainings, etc.

### 3. Future expansion

In 2020/21, Sudan planned to expand the wheat production area to 350,000 ha from the current level (Figure 1). A continuation and expansion of the project

at this rate would reach self-sufficiency four to five years from 2020. Ensuring the availability of seed is commensurate with area expansion is key to achieve the targeted plan. Strong partnerships now in place with private and public seed companies and farmer associations enabling the countrywide production of close to 65,000 tons of certified seed in 2019, compared to never exceeding 5000 tons in previous years. However, to achieve a similar or even greater result in the future, seed companies need to be guaranteed of the seed market to incentivize them to prepare and supply the seed to farmers for planting in 2020/2021.

Figure 1. Trends in wheat area, productivity, and production in Sudan.



Note: \* projection.



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## 4. The right wheat technologies

Under the SARD-SC project, several new heat tolerant wheat varieties were identified and released for commercial cultivation. Almost all previous and recent releases of ICARDA-ARC heat tolerant varieties have a protein content in the range of 12-15%. Most of the new heat tolerant wheat varieties released under SARD-SC, have a 14-15% protein content and wet gluten % above 35% which are within the required quality for industrial processing showing available choices for flour millers (Table 2). Generally, a protein content of 12-15% is acceptable for industrial processing by flour millers and this can be enhanced with better genetics and agronomic practices to meet the standard.

However the debate about domestic wheat production should go beyond protein content only, and be viewed in the context of the advantages of heat tolerant varieties that are environmental friendly, achieve 'more-with-less' in the era of water scarcity, support better food security and help to reduce expensive imports. Job creation and employment of youth and women in the value chain are also of high priority.

Table 2. Heat tolerant wheat varieties and % protein content released in Sudan.

No	Variety	% protein content	Wet Gluten (%)	Remarks
1	Khidaiwi	15	40.7	Newly released variety
2	Al-Shibaik	14.5	39.9	Newly released variety
3	Amel	15	37.2	Newly released variety
4	Salah	14.5	31.9	Newly released variety
5	Jawahir	14.5	37.8	Newly released variety
6	Zakia	14.5	35.8	Commercial variety (check)
7	Imam	14	30.0	Commercial variety (check)

Note: Almost all new varieties are released from ICARDA-ARC collaboration.

## 5. Strengthening the wheat value chain

In Sudan, the farmers (producer associations, cooperatives), the wheat producing schemes (e.g. Gezira Scheme), the seed producers, input suppliers, financial institutions (microfinance, the Agricultural Bank of Sudan (ABS)) and the agroindustry (flour millers) and the Ministry of Agriculture and Natural Resources (and its affiliated departments such as ARC) all have a significant and integrated role in the wheat sector. Wheat-producing irrigation schemes would provide basic services such as development, irrigation and public goods (research, plant protection, technology support, agricultural extension, technical studies, and training, as well as supervisory management and indicative planning).

For example, ABS has an important role in the wheat sector of implementing official pricing policies where it provides credit in-kind to farmers for the major inputs (seeds, fertilizers, pesticides and equipment) and credit in cash for services such as harvesting. ABS buys the wheat grain and deducts the credit from the payment. Grain purchased by ABS is sold on to the millers at a subsidized price, again fixed by government.

Moreover, there is no wheat grading system where there is fixed grain price irrespective of quality, and

this does not transmit guiding market signals for wheat producers. Wheat grain grading and specification ensure that the value chain actors involved in the production, aggregation, storage and processing of grain complies with the required standards and hence implications on grain pricing.

To increase domestic wheat production there should be support for some of the key areas:

- Ensure area expansion for wheat with adequate facilities for irrigation schemes (rehabilitation, cleaning, etc) and improved irrigation management to reduce the amount of water used by tonne of wheat produced
- Increase the volume of wheat seed delivery by incentivizing the private seed companies through assured markets and access to capital
- Ensure production of better grain quality by introducing grain grading system and premium pricing
- Improve logistics in aggregation, storage and transportation by cooperatives and producer associations
- Facilitate capital and credits for farmers and value chain actors financed by the agricultural, rural microfinances and commercial banks

- Creating forward and backward linkage in the wheat value chain introducing contract farming involving farmers' cooperatives/associations, seed producers, and flour millers.
- Ensure system sustainability by introducing legume crops in wheat-based cropping system to avoid wheat monocropping

## 6. Conclusion

The TAAT wheat project has so far shown remarkable results. Not just in the increased yields, productions and areas and seed multiplications, but perhaps more importantly is clear evidence that with the right

coordination and integration, stakeholders from a wide range of interested parties can not only work together towards a common goal, but are motivated to do so, with a proven benefit of a win-win for all.

There are strong opportunities, good reasons, and important choices to make for boosting a sustainable domestic wheat production in Sudan rather than depending on imports, as long as there is consistent government policy, capital and incentives for the value chain actors and the blueprints in place to do so. ICARDA strongly believes that by continuing the project, these fledging structures will become solid and resilient frameworks will contribute to the greater picture of self-sufficiency and food security, particularly in times of uncertainty and global crises.



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