Expert Validation of the Intrinsic Productivity Growth Rates for Cowpea in West & Central Africa

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1 Introduction

This expert validation report for cowpea documents expert opinions about the likely future productivity or yield trends across the major producing countries in West and Central Africa, specifically, Nigeria, Niger, Burkina Faso, Ghana and Cameroon. The consultations were conducted to update and validate cowpea yield projections in the economic modelling tools used by the Foresight and Metrics Initiative.

Africa dominates global cowpea production. In 2020/22, Africa accounted for over 90 percent of the cowpea production in the world (Food and Agricultural Organisation [FAO], 2024)[1]. In the same period, Nigeria contributed 38 percent of the global production, followed by Niger at 32 percent, Burkina Faso at 8 percent, Mali at 3 percent, Ghana at 2 percent, Senegal at 2 percent and Cameroon at 2 percent. In that period, West Africa alone contributed over 80 percent of the global cowpea production (FAOSTAT, 2024).

Despite Africa leading the global production of cowpea, the cowpea yields vary significantly across the continent. For instance, in 2020/22, Ghana had the highest yield of 1.62 tons/ha, followed by Nigeria (0.84 tons/ha), Cameroon (0.82 tons/ha) and Senegal (0.74 tons/ha) (FAOSTAT, 2024). Other regional producers had lower yields, including Mali (0.50 tons/ha), Burkina Faso (0.48 tons/ha) and Niger (0.41 tons/ha). These substantial yield gaps across African countries highlight the potential for significant improvements in cowpea production in Africa.

It is important to ensure that cowpea features accurately in global models to generate reliable evidence aimed at informing policymakers and donors. By highlighting cowpea's potential and yield trends, we can provide crucial data to support decision-making processes, help allocate resources efficiently, and drive investments in agricultural development. This ensures that policies and interventions are based on solid evidence, ultimately leading to enhanced crop quality and productivity, improved food and nutritional security, and sustainable livelihoods and economic growth in the region.

This technical report is organized into six main sections. The next section provides the methodology section outlining research design, data collection and analysis. Section 3 provides country-wise expert feedback from six countries: Nigeria, Niger, Ghana, Burkina Faso, Cameroon,

[1] The Food and Agricultural Organisation (FAO) Statistical data was accessed on September, 2024 and the figures in this report were presented based on 3-year moving averages.

and Mali. Section 4 provides a summary of the key outcomes of the expert validation exercise, highlighting the prospects of cowpea productivity growth in West and Central Africa for 2030, 2040 and 2050. Finally, the report concludes with key findings and policy implications.

2 Methods

The expert validation exercise for the intrinsic productivity growth rates (IPRs) for cowpea was conducted on the 27th of September 2024, following the World Cowpea Research Conference held on 23rd to 26th September 2024 in Cotonou, Benin. The conference brought together plant breeders, agronomists, geographical information system (GIS) specialists, product development managers, plant physiologists, and social scientists from Nigeria, Niger, Burkina Faso, Ghana, Mali, Cameroon, and Senegal. These countries are the major cowpea producers in West and Central Africa.

Preparations for the exercise involved deciding about the setting required to conduct the interviews, organizing with the conference committee on possible venues and time, review of the objectives and procedures of the expert interview, and assignment of tasks. Preparations further involved summarising time series data for cowpea production, yields and cropping acreage from 1961 to 2022 that was obtained from the FAO (FAOSTAT, 2024). Future productivity rates, known as intrinsic productivity growth rates (IPRs), were also retrieved from the IPR tool (Orozco Ceron et al., 2024). Subsequently, PowerPoint presentations were prepared to illustrate past trends in production, yields and acreage and future trends in productivity. Furthermore, the preparations involved deciding on approaches of presenting the historical data and projections, how to synthesize the information acquired from the experts, and who are possible experts to be interviewed.

2.1 Expert Validation

The expert validation session was held on 27th September 2024 and included presentations of historical data (from FAOSTAT) on cowpea production, acreage and yield and future projections from the IMPACT model for each targeted cowpea producing country. The presentation aimed to provide a thorough understanding of cowpea production trends and potential future yields to support the elicitation of updated IPRs. Experts were asked to provide their opinions on two key questions as follows:

1) Given research efforts and past experiences on how yields have evolved, what would the yam yields be by 2030, 2040, and 2050? Would yields increase, decrease, or stagnate (remain more or less the same as in 2022)? Why?
2) The global model, IMPACT, shows future trends in yam yields. How would you relate your expectations to those of IMPACT? Indicate whether and why your expectations correspond with any or none of the three scenarios.

3 Country-wise Expert Feedback

3.1 Nigeria

The Product Design Team (PDT) for cowpea in Nigeria comprised of a breeder, an agronomist, and a social scientist specialising on extension services. During the session, the facilitators presented Figure 1 showing the historical trends of Nigeria's annual cowpea production, yields, and acreage from 1961 to 2022.

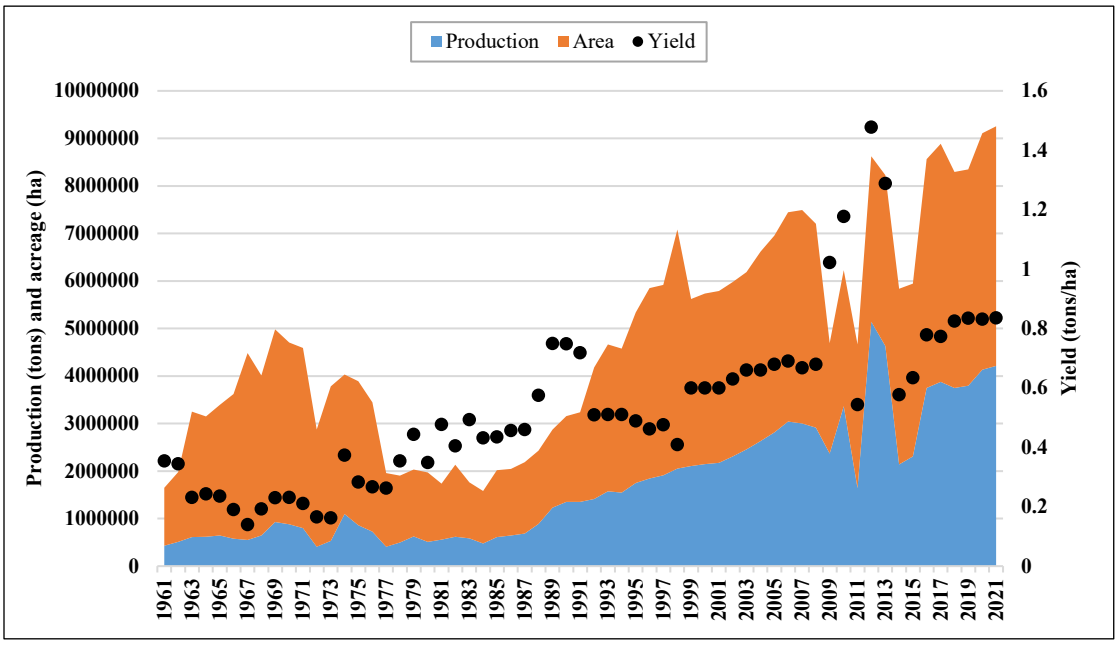

Figure 1: Historical trends in cowpea yields, acreage, and production in Nigeria
Source: Authors using data from (FAOSTAT, 2024)

Using Figure 1, the experts were informed that Nigeria's cowpea production has steadily increased from annual moving average production of 516,667 tons in 1961/63 to 4,182,759 tons in 2020/22. The production growth is attributed to increases both in acreage and in yields. More specifically, average annual cowpea production increased more than 8 times between 1961/63 and 2020/22. Over the same period, acreage more than doubled (2.8 times); yields also more than doubled (2.9 times). As such, we can conclude that increasing yields and acreage contributed almost equally to growth in cowpea production. Figure 2 was also presented to show the historical yields in Nigeria's cowpea yields.

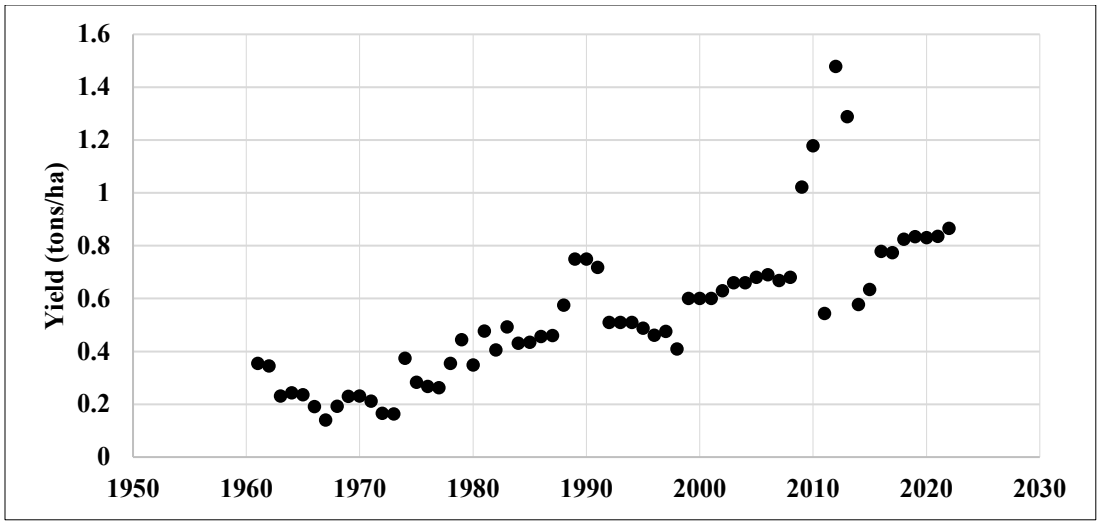

Figure 2: Historical trends in cowpea yields in Nigeria (1961-2022)
Source: Authors using data from (FAOSTAT, 2024)

Based on Figure 2, facilitators illustrated to experts that Nigeria's cowpea yields have been rising from 0.291 tons/ha in 1961/63 to 0.842 tons/ha in 2020/22, despite strong fluctuations between 2010 and 2016. Considering research efforts and the past experiences on how yields have evolved, experts were asked whether crop yields would increase, decrease, or remain constant in 2030, 2040 and 2050 compared to 2022 levels, and to provide justifications for their opinions.

According to the experts, there should be a continued upward trend in cowpea yields for Nigeria. This projection is based on several key factors, including technological advancement that involves high-yielding varieties; Good Agronomic Practices (GAP); and mechanization. However, the panel also acknowledged potential challenges such as climate variability, pests and diseases, and market uncertainties. To sustain the positive trend, continued investment in research, extension services, and supportive policies would be essential. Lastly, the facilitators presented Figure 3 to show the future cowpea yield projections from the IMPACT model.

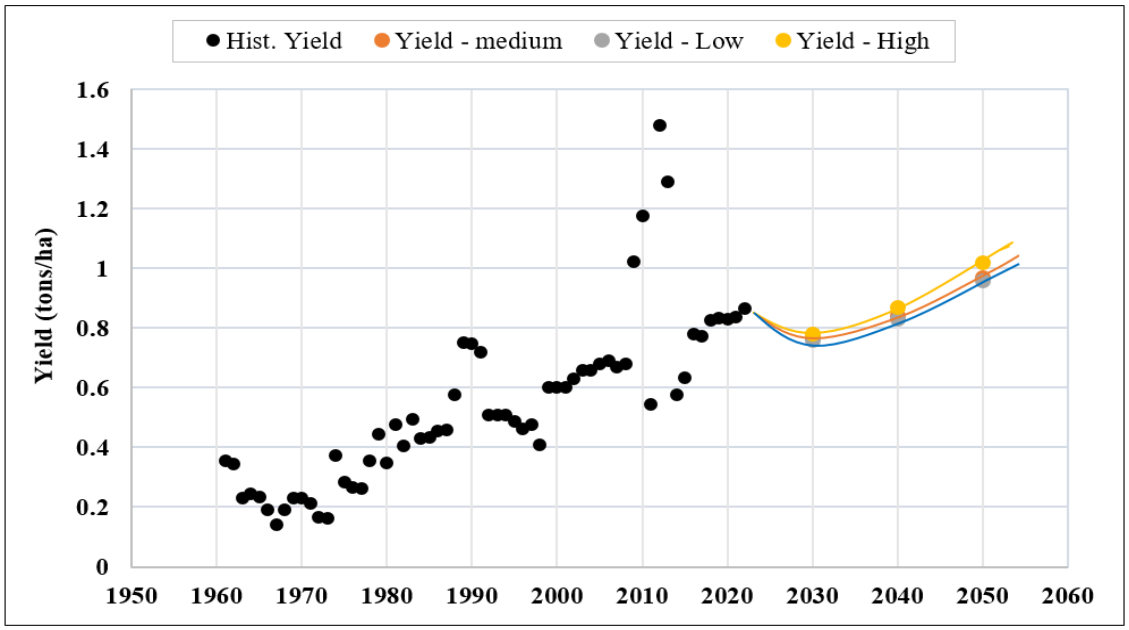

Figure 3: Past and projected trends in cowpea yields for Nigeria
Source: authors using data from (FAOSTAT, 2024; Orozco Ceron et al., 2024)

Based on the Figure 3, Nigeria's projected cowpea yields from IMPACT suggest rising yields which would reach about 1 ton/ha by 2050. The projections imply a reduction in the annual moving average yield by 2030 (0.76 to 0.78 tons/ha) compared to 2019/21 (0.834 tons/ha); by 2040, the moving average yield should have risen to about 0.83-0.87 tons/ha. Subsequently, the PDT reviewed Table 1, which provides the projected low, medium and high cowpea yields in tons/ha for all climate change scenarios in IMPACT. The experts were then asked to compare their own expectations with the IMPACT model forecasts, considering whether their views were aligned with any of the three scenarios. The experts disagreed with the projected crop yields across all scenarios; they also provided their own expected levels of future yields and cited the reasons listed above for their choices.

Table 1: Projected cowpea yields in Nigeria for 2030, 2040 and 2050

Year	Yield - low (tons/ha)	Yield - medium (tons/ha)	Yield - high (tons/ha)	Expectations (tons/ha)
2030	0.76	0.77	0.78	0.92
2040	0.83	0.84	0.87	0.97
2050	0.96	0.97	1.02	1.10

Source: authors using data from expert consultations and (Orozco Ceron et al., 2024)

3.2 Niger

The cowpea PDT for Niger comprised of a breeder and a social scientist specialised in various fields including gender. The facilitators presented Figure 4 showing the historical trends of Niger's cowpea production, yields and acreages from 1961 to 2022.

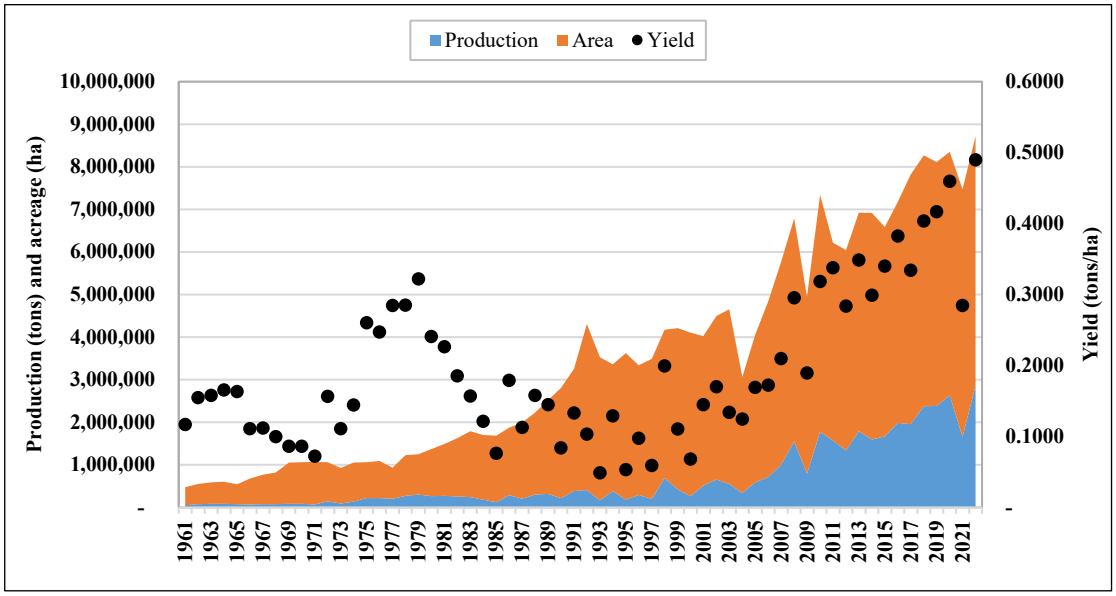

Figure 4: Historical trends in cowpea yields, acreage, and production in Niger
Source: Authors using data from (FAOSTAT, 2024)

Using Figure 4, the experts were informed that Niger's annual cowpea production has steadily increased from 67,833 tons in 1961/63 to 2,383,903 tons in 2020/22. The production growth is more associated with increases in acreage than yields. More specifically, annual cowpea production increased more than 35 times between 1961/63 and 2020/22 . During the same period, cowpea acreage increased 12.4 times, while cowpea yields increased 2.8 times. Thus, we can conclude that increasing acreage contributed more to growth in cowpea production compared to yields. Figure 5 was also presented to show the historical yields in Niger's cowpea yields.

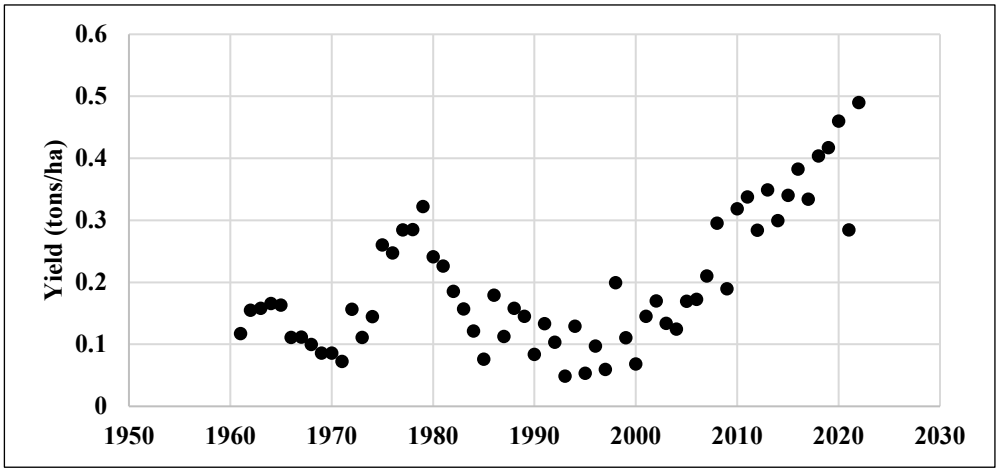

Figure 5: Historical trends in cowpea yields in Niger (1961-2022)
Source: Authors using data from (FAOSTAT, 2024)

Based on Figure 5, the facilitators illustrated to experts that Niger's cowpea yields have been modestly increased from 0.145 tons per hectare in 1961/63 to 0.411 tons per hectare in 2020/22. Considering research efforts and the past experiences on how yields have evolved, experts were asked whether crop yields would increase, decrease, or remain constant in 2030, 2040 and 2050 compared to 2022 levels, and to provide justifications for their opinions.

According to the experts, annual cowpea yields for Niger should continue rising moving forward from 2030 to 2050. The continued growth in yields would be attributed to international breeding efforts leading to the development of high-yielding, disease-resistant cowpea varieties. Additionally, the experts highlighted that the strengthening of the cowpea value chain through various initiatives would further enhance the adoption of these high-yielding varieties, thereby contributing to upward trends in cowpea yields. Lastly, the facilitators presented Figure 6 to show the future cowpea yield projections from the IMPACT model.

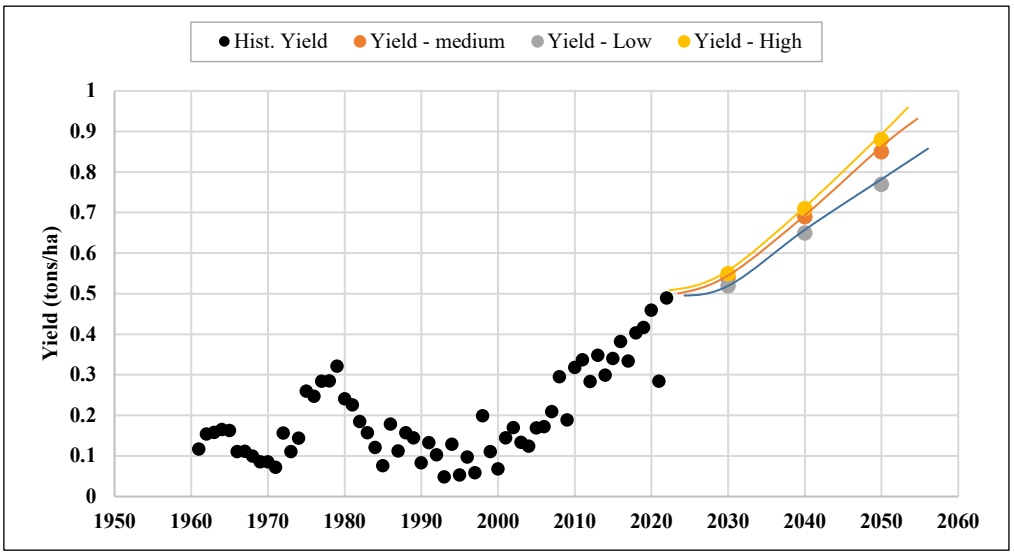

Figure 6: Past and projected trends in cowpea yields in Niger (2030, 2040 and 2050)
Source: authors using data from (FAOSTAT, 2024; Orozco Ceron et al., 2024)

Figure 6 suggests that Niger's cowpea yields will continue to rise. Yields would rise from an annual average of 0.411 tons/ha in 2020/22 to 0.65-0.71 tons/ha by 2030, 0.65-0.71 tons/ha by 2040, and 0.77-0.88 tons/ha by 2050. Subsequently, the PDT members reviewed Table 2, which outlined projected low, medium, and high cowpea yields in tons per hectare for all climate change scenarios in IMPACT. The experts were then asked to compare their own expectations with the IMPACT model forecasts, considering whether their views were aligned with any of the three scenarios. The experts agreed with IMPACT's high-level yield projections and contended that a modest increase of 0.1 ton/ha, from the current 0.45 kg/ha, was a realistic target.

Table 2: Projected cowpea yields in Niger for 2030, 2040 and 2050

Year	Yield - low (tons/ha)	Yield - medium (tons/ha)	Yield - high (tons/ha)	Expectations (tons/ha)
2030	0.52	0.54	0.55	0.55
2040	0.65	0.69	0.71	0.71
2050	0.77	0.85	0.88	0.88

Source: authors using data from expert consultations and (Orozco Ceron et al., 2024)

3.3 Ghana

The cowpea PDT for Ghana comprised two breeders, and a social scientist specialised in agricultural economics. Figure 7 illustrates the historical trends of Ghana's cowpea production, yields, and acreages from 2011 to 2022.

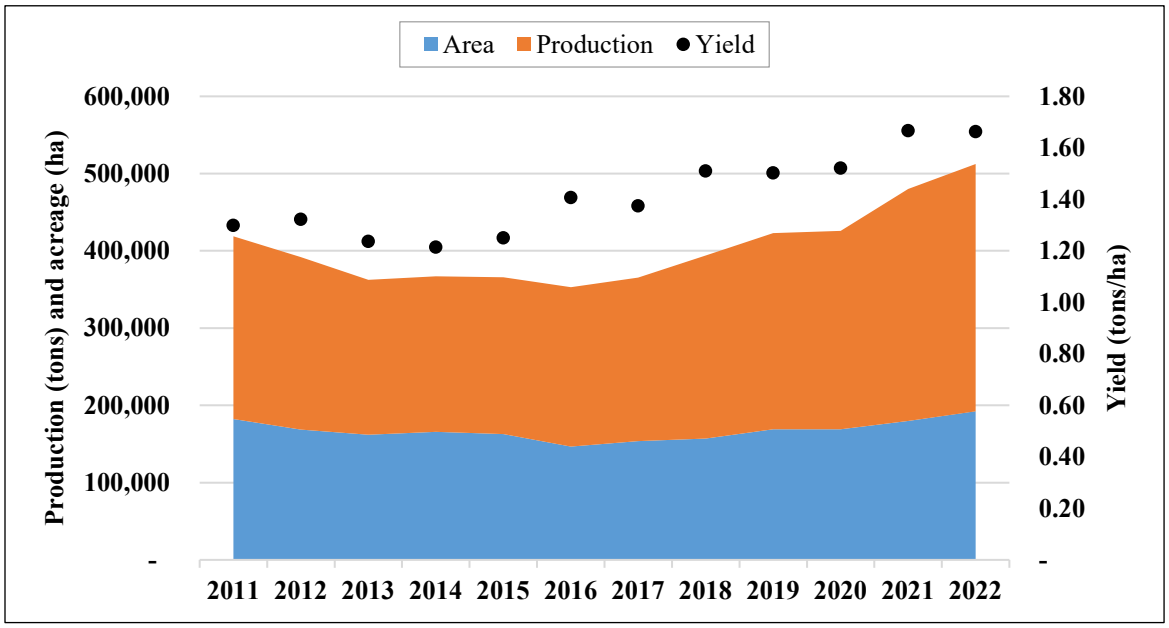

Figure 7: Historical trends in cowpea yields, acreage, and production in Ghana
Source: Authors using data from (FAOSTAT, 2024)

Using Figure 7, the experts were informed that Ghana's annual cowpea production has steadily increased by from 220,111 tons in 2011/13 to 292,320 tons in 2020/22. The growth in production is attributed to increases both in the acreage and the yields. Annual cowpea production increased 1.3 times between 2011/13 and 2020/22. Over the same period, cowpea acreage increased 1.1 times while average cowpea yields increased 1.3 times. As such, we can conclude that increasing yields and acreage contributed almost equally to growth in cowpea production. Figure 8 was also presented to show the historical yields in Ghana's cowpea yields.

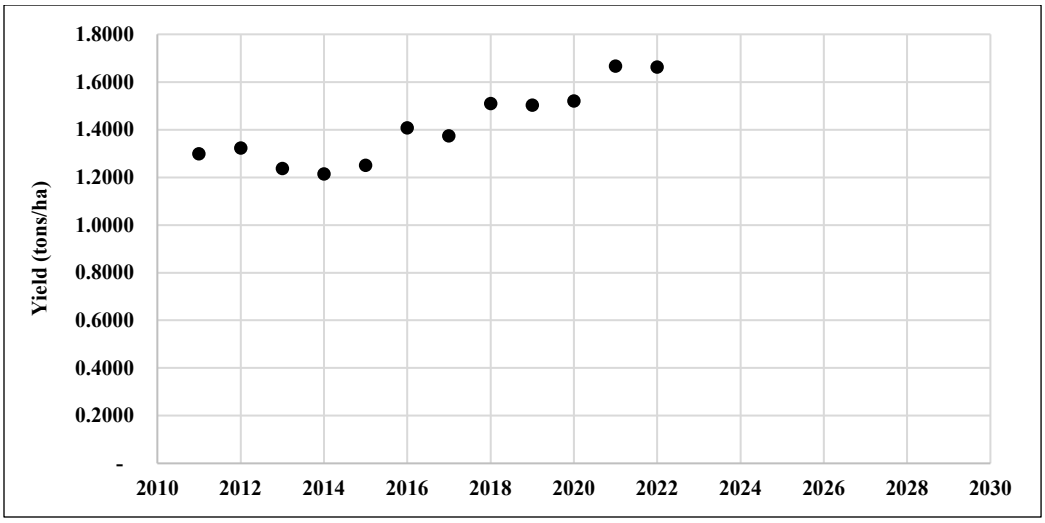

Figure 8: Historical trends in cowpea yields in Ghana (2011-2022)
Source: Authors using data from (FAOSTAT, 2024)

Using Figure 8, the facilitators explained to experts that Ghana's cowpea yields have been rising steadily from 1.287 tons/ha in 2011/13 to 1.620 tons/ha in 2020/22. Considering research efforts and the past experiences on how yields have evolved, experts were asked whether the crop yields would increase, decrease, or remain constant in 2030, 2040 and 2050 compared to 2022 levels, and to provide justifications for their opinions.

Experts projected that Ghana's cowpea yield will continue to increase by 2030, 2040, and 2050. This anticipated growth would be driven by several key factors: the development and release of climate-smart cowpea varieties; training programs on Good Agronomic Practices (GAP), integrated pest management, and postharvest management. The PDT also noted that current yield increases are partly due to the introduction of new improved varieties and breeders are working to further increase the cowpea genetic gain in the country. Finally, the demand for cowpea is expected to rise due to its high nutrient content, making it a valuable crop for the future. Lastly, the facilitators presented Figure 9 to show the future cowpea yield projections from the IMPACT model.

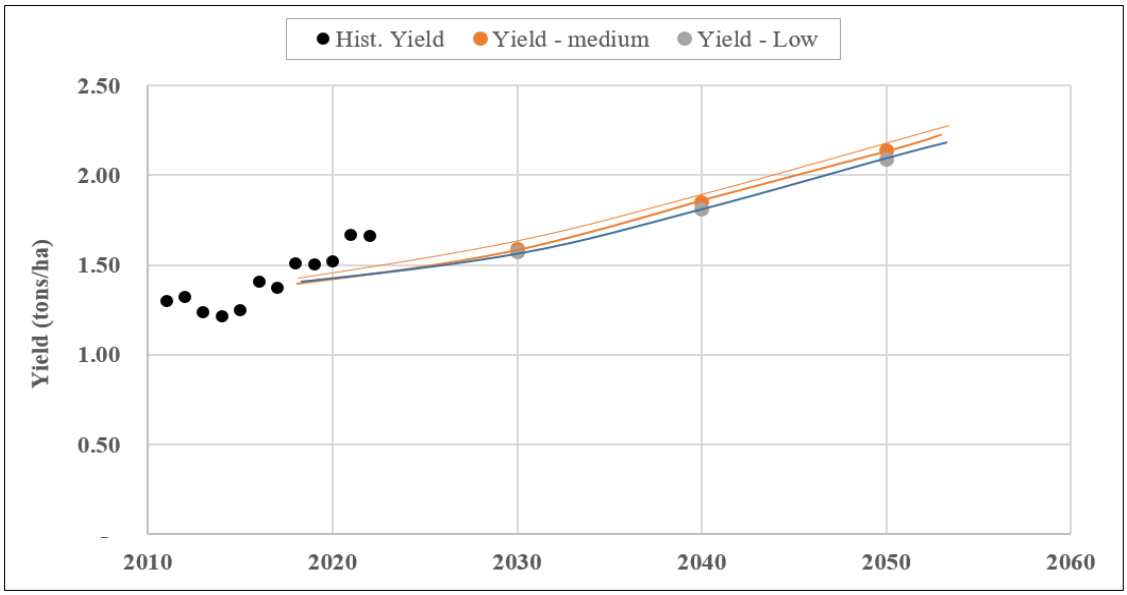

Figure 9: Past and projected trends in cowpea yields in Ghana (2030, 2040 and 2050)
Source: authors using data from (FAOSTAT, 2024; Orozco Ceron et al., 2024)

Figure 9 suggests that the projections would rise from the average annual yield of 1.62 tons/ha in 2020/22 to a range of 2.09 tons/ha to 2.2 tons/ha by 2050. The projections suggest a reduction in the annual moving average yield by 2030 (1.57 to 1.61 tons/ha) compared to 2011/13 (1.66 tons/ha). However, by 2040 and 2050, the moving average yield are expected to rise to a range of 1.81 to 1.89 tons/ha and 2.09 to 2.22 tons/ha respectively. Subsequently, the PDT reviewed Table 3, which presents projected cowpea yields for low, medium, and high scenarios for all climate change scenarios in IMPACT. The experts were then asked to compare their own expectations with the IMPACT model forecasts, considering whether their views were aligned with any of the three scenarios. The experts disagreed with the projected yields across all scenarios. They provided their own expected values on future yields and cited various reasons for their choices (Table 3).

Table 3: Projected cowpea yields in Ghana for 2030, 2040 and 2050

Year	Yield - low (tons/ha)	Yield - medium (tons/ha)	Yield - high (tons/ha)	Expectations (tons/ha)
2030	1.57	1.59	1.61	1.84
2040	1.81	1.85	1.89	2.17
2050	2.09	2.14	2.22	2.53

Source: authors using data from expert consultations and (Orozco Ceron et al., 2024)

3.4 Burkina Faso

The cowpea PDT for Burkina Faso comprised a breeder, a biotechnology engineer, and a social scientist. Figure 10 presents the historical trends of Burkina Faso's annual cowpea production, yields and acreages from 1961 to 2022.

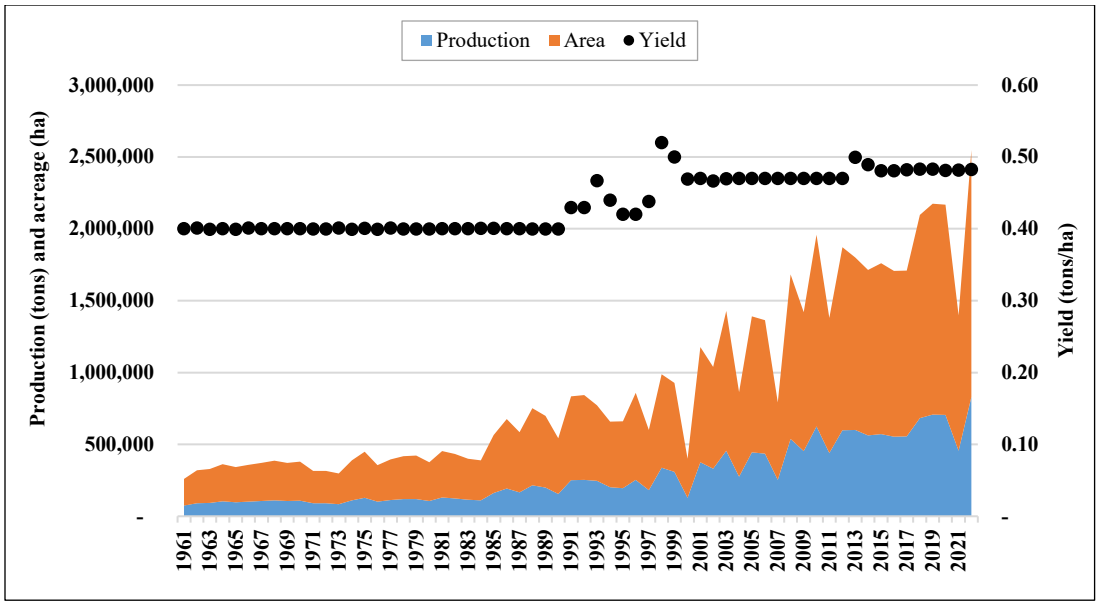

Figure 10: Historical trends in cowpea yields, acreage, and production in Burkina Faso
Source: Authors using data from (FAOSTAT, 2024)

Using Figure 10, the experts were informed that Burkina Faso's annual cowpea production increased from 86,521 tons in 1961/63 to 662,861 tons in 2020/22. The production growth is more associated with increases in acreage than yields. More specifically, annual cowpea production increased 7.7 times between 1961/63 and 2019/21. Over that same period, annual cowpea acreage increased 6.4 times between 1961/63 and 2020/22, while average cowpea yields increased 1.2 times. Therefore, we can conclude that increasing acreage contributed more to growth in cowpea production compared to cowpea yields. Figure 11 was also presented to show the historical yields in Burkina Faso's cowpea yields.

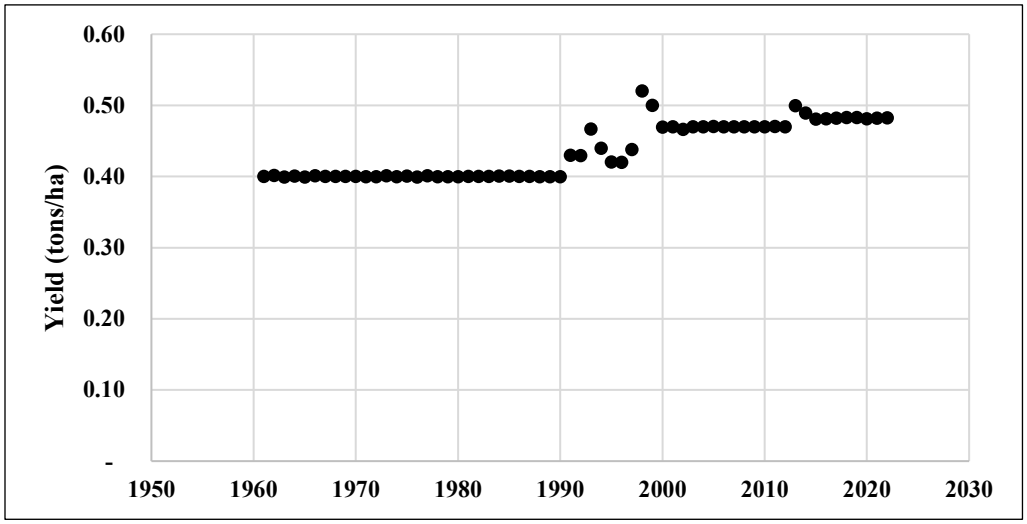

Figure 11: Historical trends in cowpea yields in Burkina Faso (1961-2022)
Source: Authors using data from (FAOSTAT, 2024)

Using Figure 11, the facilitators demonstrated to experts that cowpea yields in Burkina Faso have increased from 0.40 tons/ha in 1961/63 to 0.48 tons/ha in 2020/22. Considering research efforts and the past experiences on how yields have evolved, experts were asked whether the crop yields would increase, decrease, or remain constant in 2030, 2040 and 2050 compared to 2022 levels, and to provide justifications for their opinions.

For Burkina Faso, the PDT expects the cowpea yields to continue rising. These yield projections would be driven by key factors: disseminating high-yielding varieties; training farmers on GAP; and training value chain actors on best practices. The PDT also noted the positive political will towards supporting the agricultural sector in the country. Lastly, the facilitators presented Figure 12 to show the future cowpea yield projections from the IMPACT model.

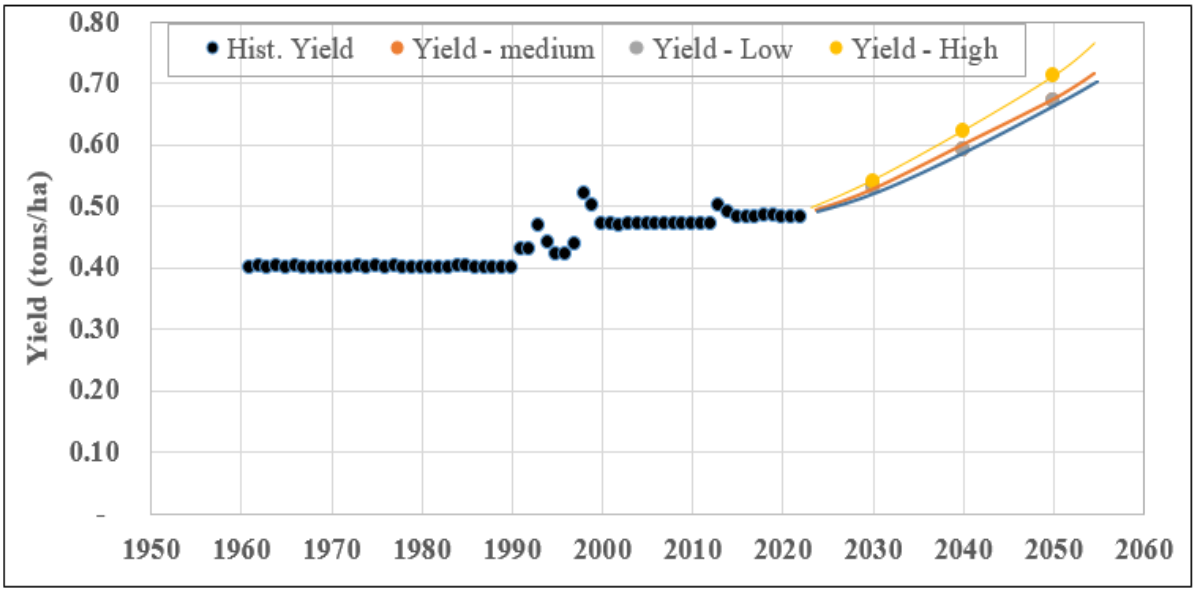

Figure 12: Past and projected trends in cowpea yields in Burkina Faso (2030, 2040 and 2050)
Source: authors using data from (FAOSTAT, 2024; Orozco Ceron et al., 2024)

Based on Figure 12, the yields are projected to rise from an average annual yield of 0.48 tons/ha in 2020/22 to 0.53-0.54 tons/ha by 2030, 0.59-0.62 tons/ha by 2040 and 0.67-0.71 tons/ha by 2050. Subsequently, the PDT reviewed Table 4, which shows projected cowpea yields for all climate change scenarios in IMPACT. Subsequently, the PDT reviewed Table 4, which presents projected cowpea yields for low, medium, and high scenarios for all climate change scenarios in IMPACT. The experts were then asked to compare their own expectations with the IMPACT model forecasts, considering whether their views were aligned with any of the three scenarios. The experts disagreed with the projected crop yields across all scenarios; they also provided their own expected values on future yields and cited various reasons for their choices.

Table 4: Projected cowpea yields in Burkina Faso for 2030, 2040 and 2050

Year	Yield - low (tons/ha)	Yield - medium (tons/ha)	Yield - high (tons/ha)	Expectations (tons/ha)
2030	0.53	0.53	0.54	0.80
2040	0.59	0.59	0.62	1.00
2050	0.67	0.67	0.71	1.50

Source: authors using data from expert consultations and (Orozco Ceron et al., 2024)

3.5 Cameroon

The cowpea PDT for Cameroon included 2 breeders. During the session, the facilitators first presented Figure 13, which highlights Cameroon's historical cowpea trends of annual production, yields and acreages from 1994 to 2022.

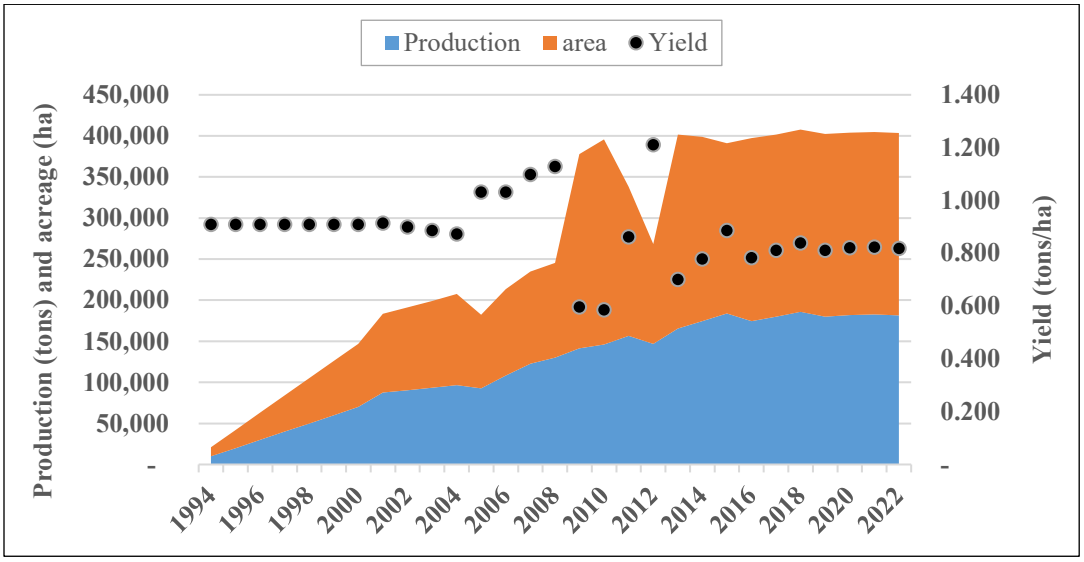

Figure 13: Historical trends in cowpea yields, acreage, and production in Cameroon
Source: Authors using data from (FAOSTAT, 2024)

Using Figure 13, the experts were informed that Cameroon's annual cowpea production has steadily increased from 20,000 tons in 1994/96 to 182,040 tons in 2020/22. The growth in cowpea production is more associated with increases in acreage than cowpea yields. More specifically, annual cowpea production increased more than 9 times between 1994/96 and 2020/22. Over the same period, annual cowpea acreage increased more than 10 times, while average annual cowpea yields increased 0.9 times. Therefore, we can conclude that increasing acreage contributed more to growth in cowpea production compared to cowpea yields. Figure 14 was also presented to show the historical yields in Cameroon's cowpea yields.

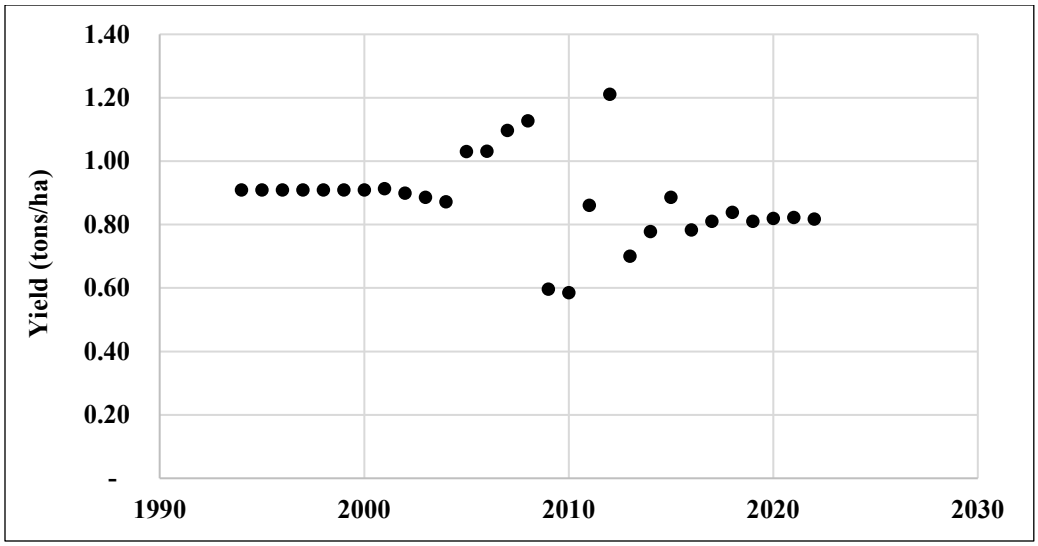

Figure 14: Historical trends in cowpea yields in Cameroon (1994-2022)
Source: Authors using data from (FAOSTAT, 2024)

The facilitators presented Figure 14 and explained that Cameroon's cowpea yields have declined from 0.909 tons/ha in 1994/96 to 0.820 tons/ha in 1994/96. Despite this decline, the PDT for cowpea in Cameroon anticipates a slight increase in Cameroon's cowpea yields from 2020 to 2030 due to the following reasons:

- Development of varieties that are resilient to climatic conditions
- Introduction of mechanization

Moving forward from 2030 to 2040, the experts contended that Cameroon would have a more pronounced increase in productivity due to the following factors:

- Wider diffusion of mechanization.
- Wider diffusion of new varieties.
- An increase in demand

Lastly, the facilitators presented Figure 15 to show the future cowpea yield projections from the IMPACT model.

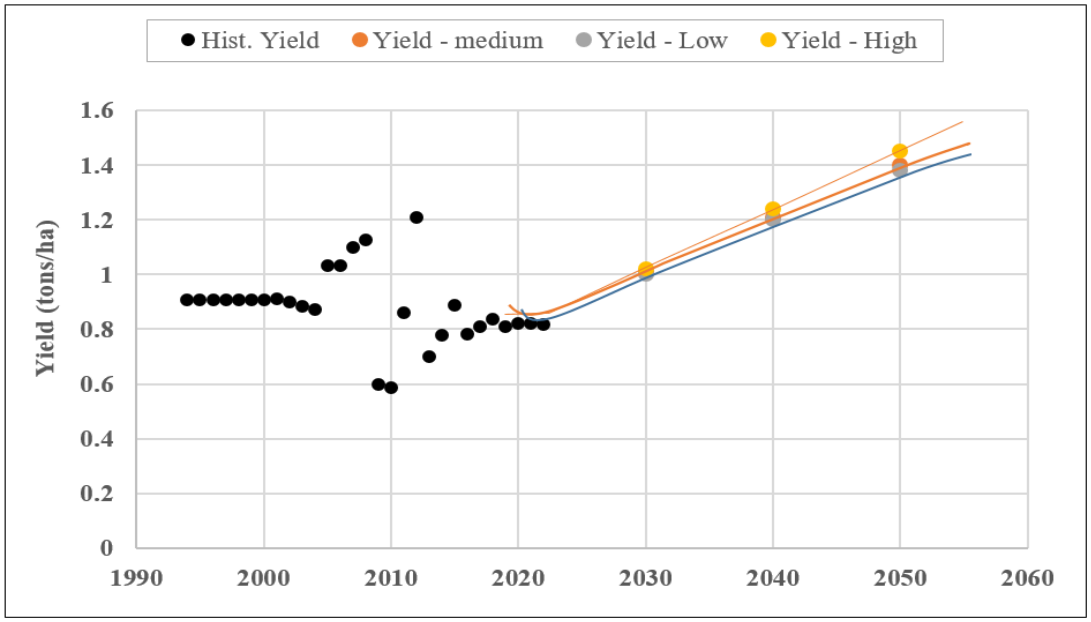

Figure 15: Past and projected trends in cowpea yields in Cameroon (2030, 2040 and 2050)
Source: authors using data from (FAOSTAT, 2024; Orozco Ceron et al., 2024)

Figure 15 shows that Cameroon's cowpea yields would continue rising from the average annual yield of 0.82 tons/ha in 2020/22. The projections from the IMPACT model imply an increase to 1.00-1.02 tons/ha by 2030, 1.20-1.24 tons/ha by 2040, and 1.38-1.45 tons/ha by 2050. Subsequently, the Product Design team (PDT) experts reviewed Table 5, which provided projected yields for low, medium, and high cowpea yields for all climate change scenarios over the same three decades. The experts were then asked to compare their own expectations with the IMPACT model forecasts, considering whether their views were aligned with any of the three scenarios. The experts agreed with the IMPACT's medium-level yield projections and cited the introduction of high-yielding climate resilient varieties and adapting mechanization as key drivers of the expected future positive outlook.

Table 5: Projected cowpea yields in Cameroon for 2030, 2040 and 2050

Year	Yield - low (tons/ha)	Yield - medium (tons/ha)	Yield - high (tons/ha)	Expectations (tons/ha)
2030	1.00	1.01	1.02	1.01
2040	1.20	1.21	1.24	1.20
2050	1.38	1.40	1.45	1.40

Source: authors using data from expert consultations and (Orozco Ceron et al., 2024)

3.6 Mali

The cowpea PDT for Mali comprised a breeder and a social scientist. Figure 16 presents the historical trends of Mali's annual cowpea production, yields and acreages from 1961 to 2022.

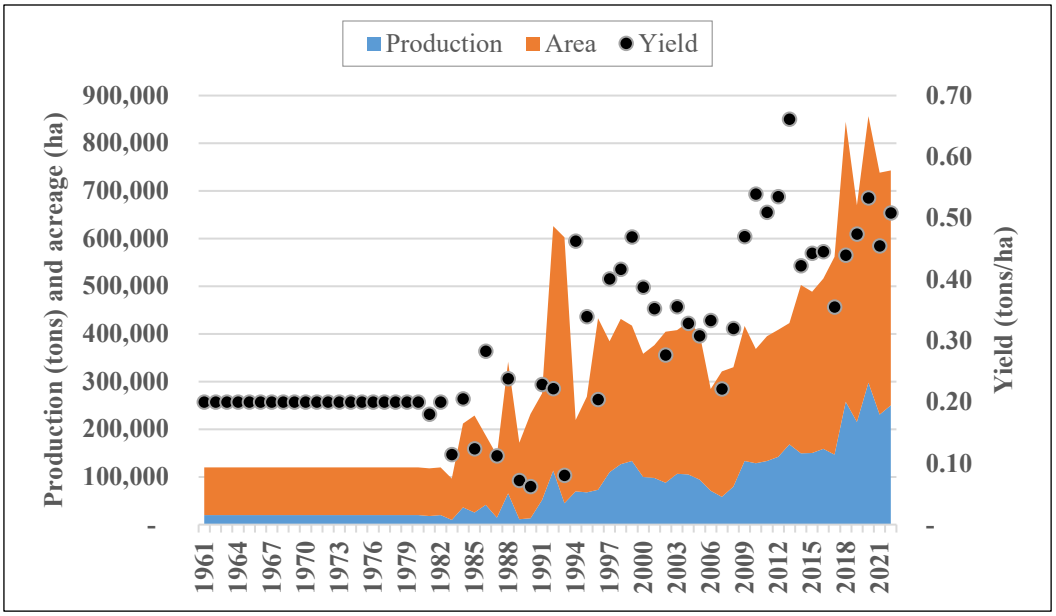

Figure 16: Historical trends in cowpea yields, acreage, and production in Mali
Source: Authors using data from (FAOSTAT, 2024)

As shown in Figure 16, the experts were informed that annual cowpea production for Mali increased from 20,000 tons in 1961/63 to 259,606 tons in 2020/22. The growth in production is more associated with increase in acreage than cowpea yields. More specifically, the annual cowpea production increased about 13 times between 1961/63 and 2020/22. During the same period, annual cowpea acreage increased 5.2 times, while annual cowpea yields increased 2.5 times. Therefore, we can conclude that increasing acreage contributed more to growth in cowpea production compared to cowpea yields. Figure 17 was also presented to show the historical yields in Mali's cowpea yields.

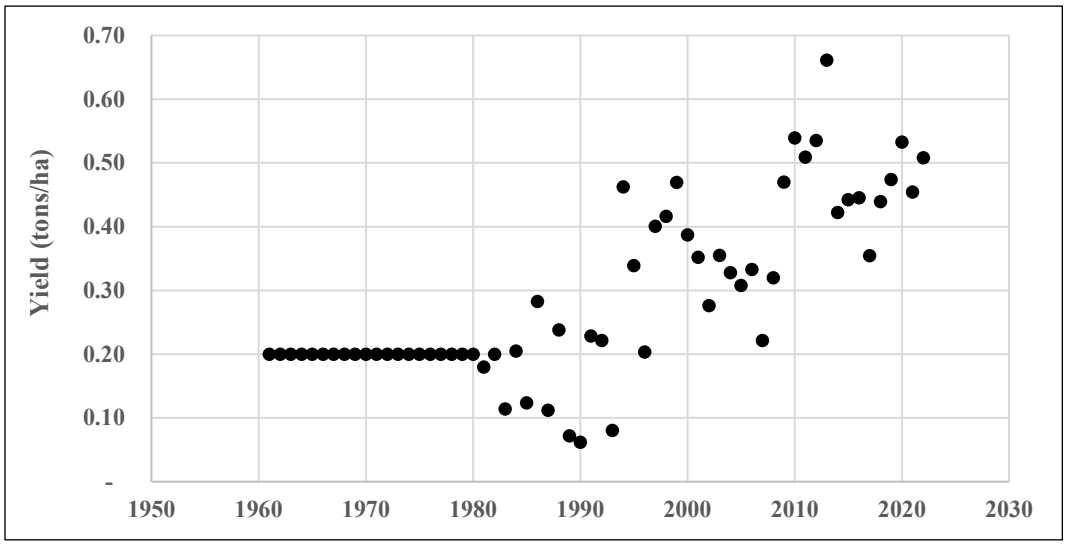

Figure 17: Historical trends in cowpea yields in Mali (1961-2022)
Source: Authors using data from (FAOSTAT, 2024)

Based on Figure 17, the facilitators explained that Mali's cowpea yields slowly rose from 0.2 tons/ha in 1961/63 to 0.508 tons/ha in 2020/22. Considering research efforts and the past experiences on how yields have evolved, the experts were asked whether the crop yields would increase, decrease, or remain constant in 2030, 2040 and 2050 compared to 2022 levels, and to provide justifications for their opinions.

The experts unanimously anticipate future yields to increase, due to several key drivers which include: adoption of improved varieties; adoption of good agricultural practices (GAP) by farmers; integrated pest management; and mechanization on farmers' fields. Lastly, the facilitators presented Figure 18 to show the future cowpea yield projections from IMPACT model.

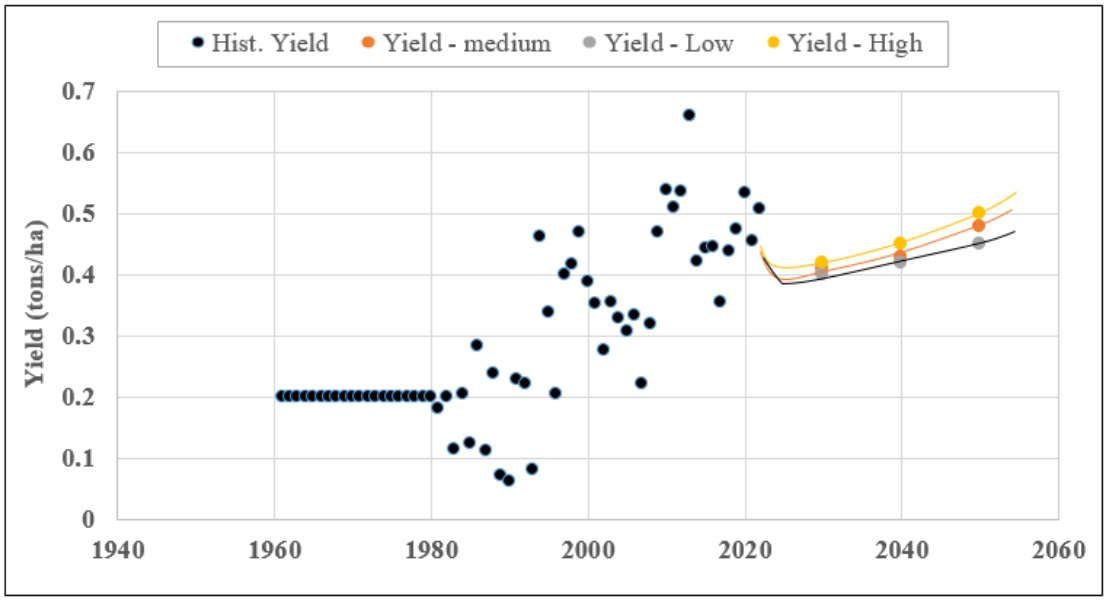

Figure 18: Past and projected trends in cowpea yields in Mali (2030, 2040 and 2050)
Source: authors using data from (FAOSTAT, 2024; Orozco Ceron et al., 2024)

Figure 18 shows that Mali's cowpea yield projections from IMPACT would not surpass the annual moving average yield of 0.50 tons/ha for the period of 2020/22. The projections imply a reduction in the annual moving average yield by 2030 (0.40 to 0.42 tons/ha) compared to 2020/22 (0.50 tons/ha). However, the yield is projected to increase slightly to 0.42-0.45 tons/ha by 2040 and then reach about 0.45-0.5 tons/ha by 2050. Subsequently, the PDT reviewed Table 6, which presents the projected cowpea yields for all climate change scenarios in IMPACT. The experts were then asked to compare their own expectations with the IMPACT model forecasts, considering whether their views were aligned with any of the three scenarios. The experts expressed disagreement with the projected crop yields across all scenarios. They also offered their own expected values for future yields and provided various reasons for their choices.

Table 6: Projected cowpea yields in Ghana for 2030, 2040 and 2050

Year	Yield - low (tons/ha)	Yield - medium (tons/ha)	Yield - high (tons/ha)	Expectations (tons/ha)
2030	0.40	0.41	0.42	0.50
2040	0.42	0.43	0.45	0.60
2050	0.45	0.48	0.50	0.70

Source: authors using data from expert consultations and (Orozco Ceron et al., 2024)

4 Key Outcomes of the Expert Validation

The expert validation exercise had two key outcomes. First, cowpea experts from Nigeria, Niger, Ghana, Burkina Faso, Cameroon and Mali unanimously expect rising cowpea yields between 2030 and 2050, driven by factors such as development of new improved climate-resilient varieties, government initiatives, mechanization, and growing demand for cowpea due to their nutritional benefits. Second, experts' expectations were higher than those from the IMPACT model for Nigeria, Ghana and Burkina Faso. For the other countries, the experts' projections fell within the projected yields from IMPACT. Figure 19 presented the outcomes of the expert consultations in terms of expected cowpea yields in 2030, 2040, and 2050 across West and Central Africa.

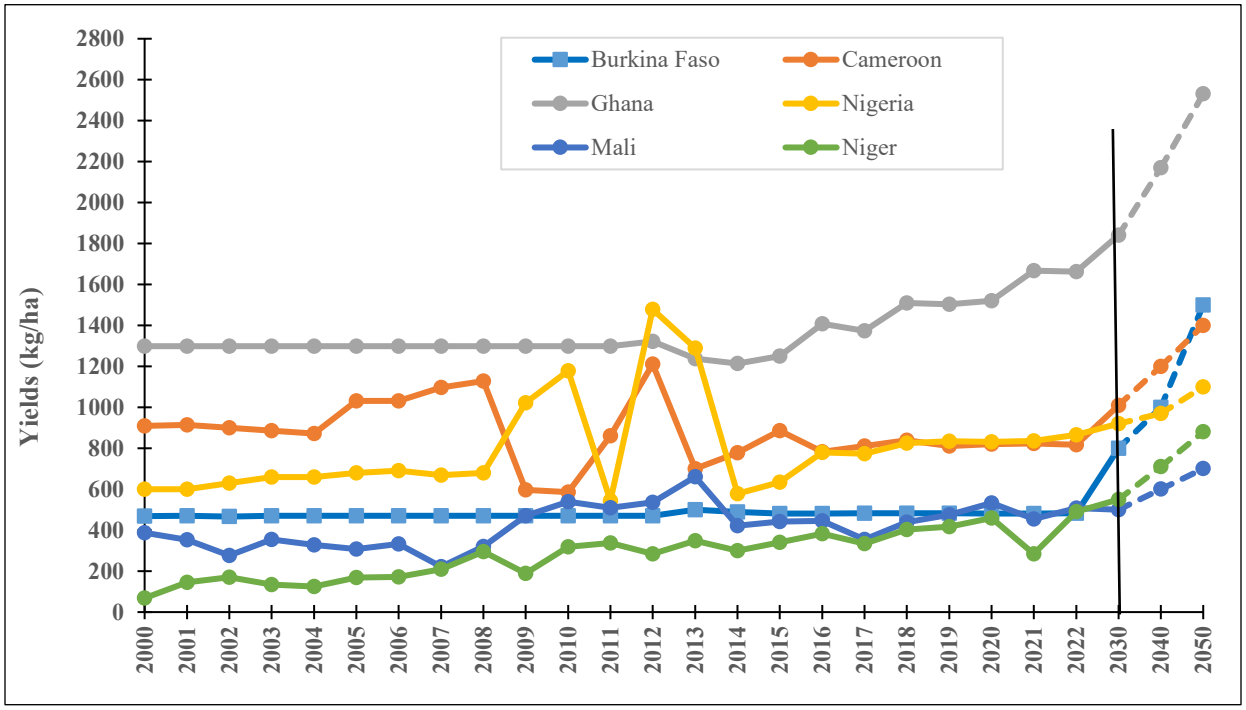

Figure 19: Past yield trends and expert estimates of future cowpea yields in West & Central Africa

Source: authors using data from expert consultations and (Orozco Ceron et al., 2024)

Figure 19 illustrates that, based on the historical trends of cowpea yields, the expert opinion strongly suggests that future cowpea yields will significantly increase in West and Central Africa by 2030, 2040, and 2050. The projected upward trends by the experts are higher than the projections from the IMPACT model for Nigeria, the largest cowpea producer and consumer in the world; it is also higher for Ghana and Burkina Faso. For all other countries, including Niger which is the second largest cowpea producer in the world, the projections from the experts fall within the projections from the IMPACT model. Various factors were identified which would contribute towards increasing future yields: climate-resilient varieties, government initiatives, mechanization, growing demand, public-private partnerships, agricultural investments, and improved cowpea varieties. This optimistic outlook highlights the potential for technological advancements, policy support, and market demand to drive cowpea production growth in the region.

5 Conclusion and Policy Implications

Both the IMPACT model projections and the expert consultations show that cowpea yields are expected to significantly increase in West and Central Africa between 2030 and 2050. The experts' consultations show that the yield increases will be driven by climate-resilient varieties, government initiatives, mechanization, growing demand, public-private partnerships, agricultural investments, and improved cowpea varieties. This optimistic outlook underscores the potential for technological advancements, policy support, and market demand to drive cowpea production growth in the region.

References

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Appendix A: List of experts for the validation exercise conducted in Cotonou, Benin

Name	Institute
Benoit Joseph Batieno	INERA; Burkina Faso
Leandre Saadon Poda	INERA; Burkina Faso
Eveline COMPAORE	INERA; Burkina Faso
Sory Diallo	Institut d'Economie Rurale (IER), Mali
Koné Bourema	Institut d'Economie Rurale (IER), Mali
Sobda Gonné	Institut de Recherche Agricole pour le Développement (IRAD), Cameroon
Merline Fankou	Institut de Recherche Agricole pour le Développement (IRAD), Cameroon
Theophilus Kwabla Tengey	CSIR-Savannah Agricultural Research Institute, Ghana
Emmanuel Yaw Owusu (PhD)	CSIR-Savannah Agricultural Research Institute, Ghana
Edward Martey	CSIR-Savannah Agricultural Research Institute, Ghana
UMAR, Muhammad Lawan	Institute for Agricultural Research (IAR), Nigeria
Teryima Iorlamen	Joseph Sarwuan Tarka University, Makurdi, Nigeria
Prof. Hajara Shuaibu	Institute for Agricultural Research (IAR), Nigeria
Abdou Souleymane	Institut Nationale de la Recherche Agronomique du Niger (INRAN), Niger
Germaine Ibro	Institut Nationale de la Recherche Agronomique du Niger (INRAN), Niger
Ousmane Boukar	International Institute of Tropical Agriculture (IITA)
Christian Fatokun	International Institute of Tropical Agriculture (IITA)
Patrick Ongom	International Institute of Tropical Agriculture (IITA)
Lucky Omoigui	International Institute of Tropical Agriculture (IITA)
Arega Alene	International Institute of Tropical Agriculture (IITA)
Sika Gbegbelegbe	International Institute of Tropical Agriculture (IITA)
Tunrayo Alabi	International Institute of Tropical Agriculture (IITA)
Dean Muungani	International Institute of Tropical Agriculture (IITA)
Andrea Mjuma	International Institute of Tropical Agriculture (IITA)
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