

Impact Assessment @ ICRISAT

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INSTITUTE FOR THE SEMI-ARID TROPICS

Introduction

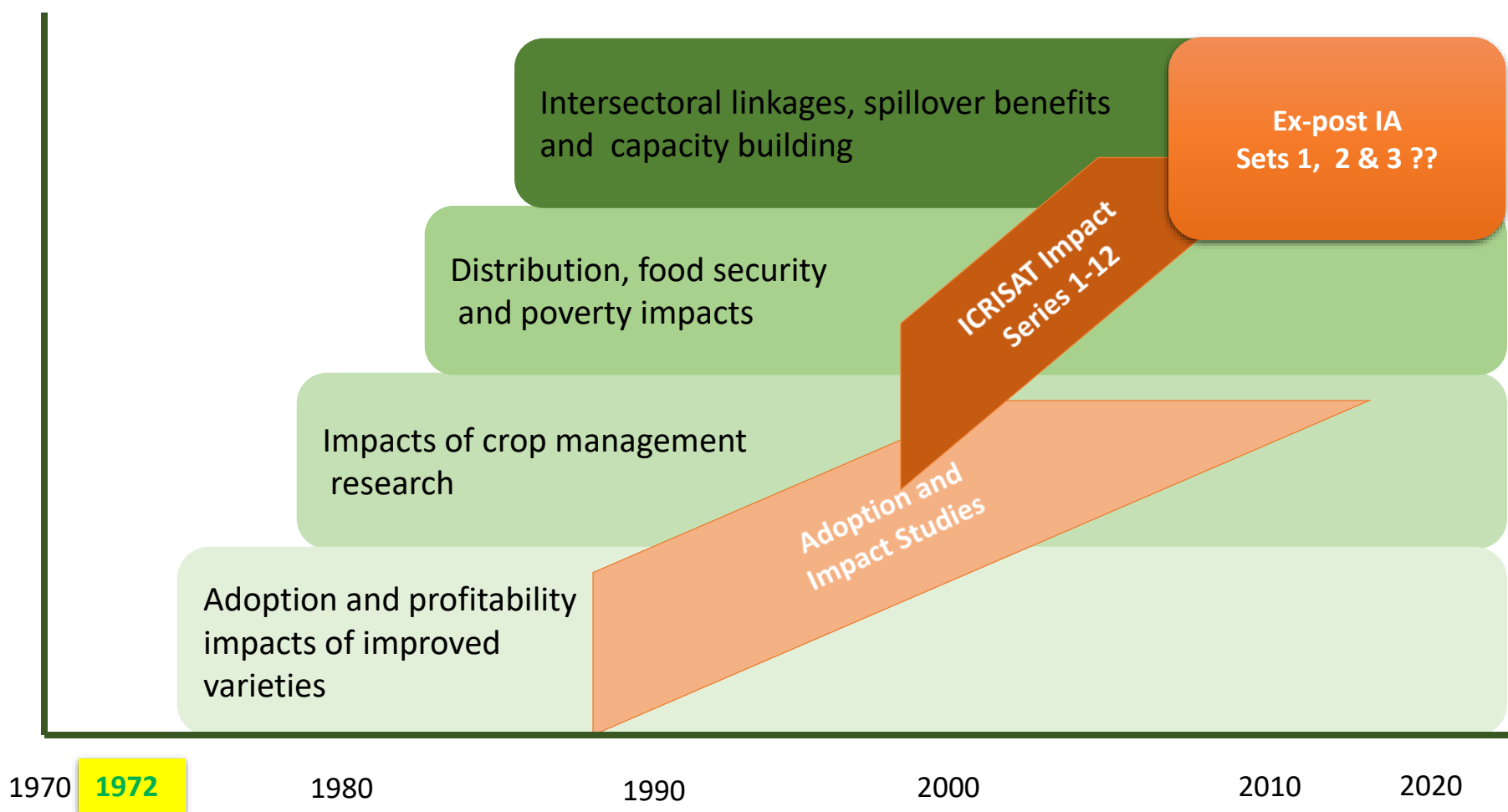


- The outputs from impact assessment studies provide essential insights and feedback to the research and development process at ICRISAT.
- The majority of ex-post impact assessment studies at ICRISAT have focused on the impacts of genetic improvement of mandate crops.
 - Impact assessment of Chickpea in Andhra Pradesh,
 - HPRC – pearl millet in India,
 - Groundnut development in Malawi,
 - Sorghum in Mali,
 - Sorghum in Tanzania, and
 - Pigeon Pea in Tanzania.
- Some work on on impacts of Natural Resources Management,
 - Watershed Program in India, and China, Microdosing in Niger and Zimbabwe.
 - Use of new methods on assessing impacts of natural resources management, crop-livestock research and policy-oriented research programs (eg. Village Levels Studies)
- Support from Standing Panel on Impact Assessment (SPIA)

ICRISAT has moved with expanded agenda of Impact Assessment (IA) research



Need for
sustained
resource
support





Study Highlights 2018

Ethiopia and Myanmar

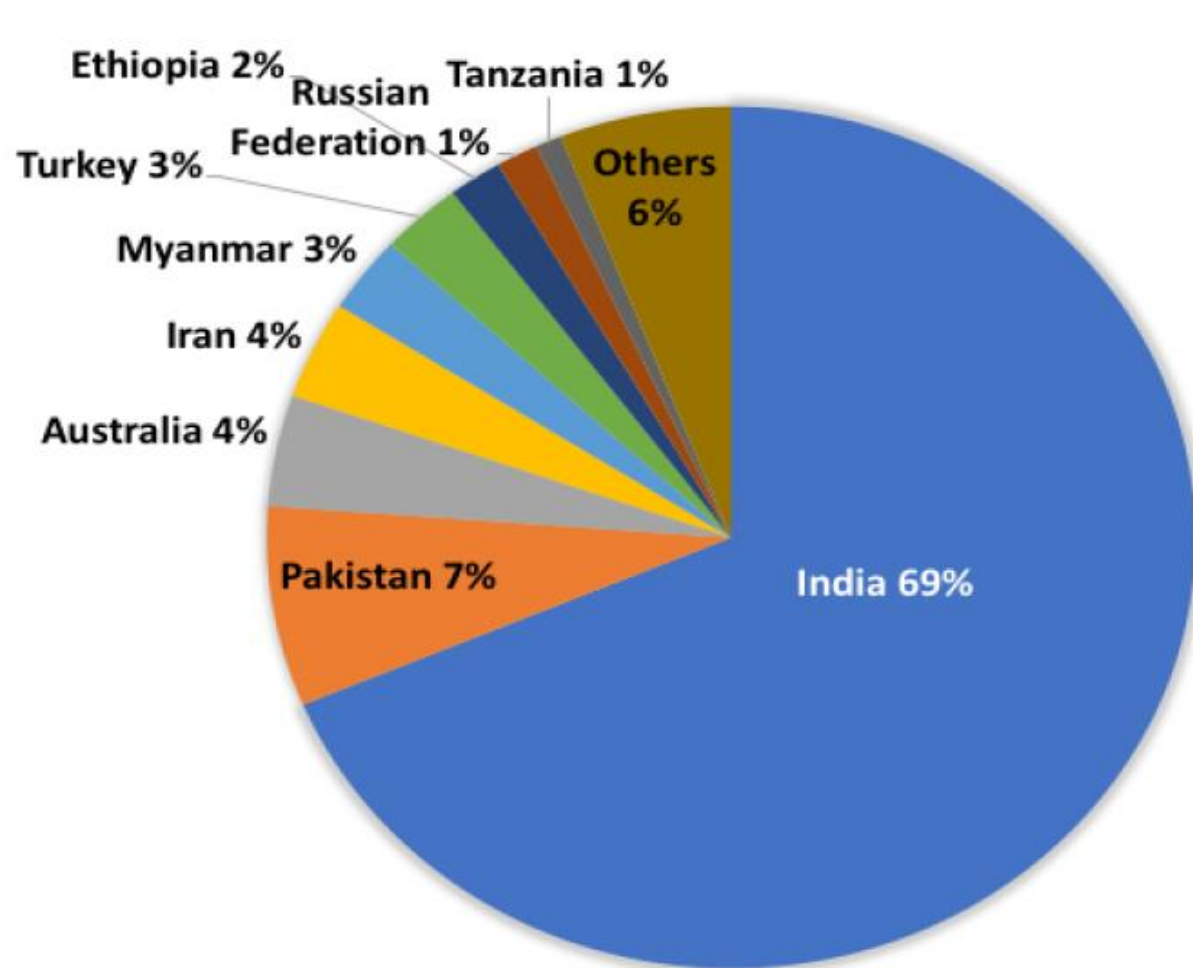
Chickpea in Ethiopia



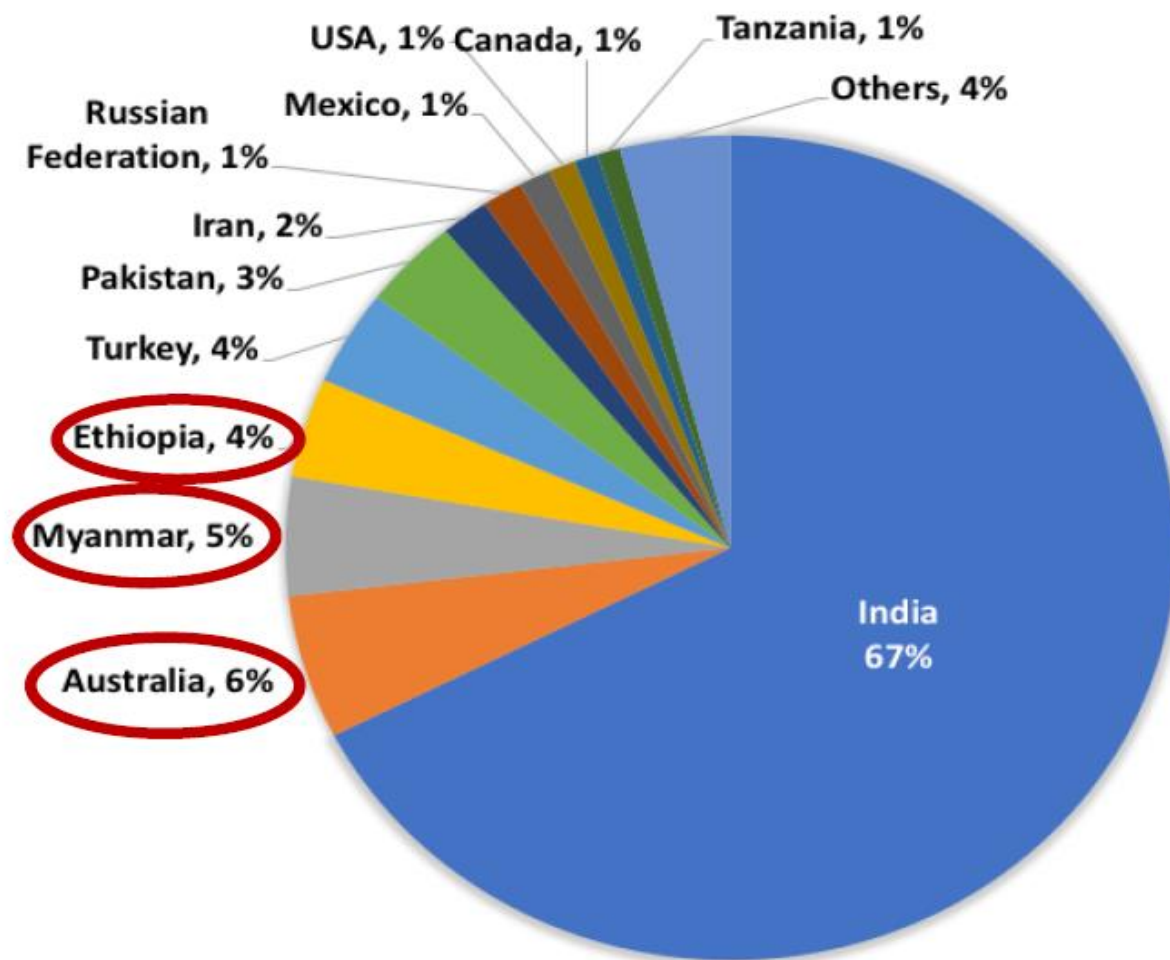
- **Introduction**

- The climatic conditions in Ethiopia make it very suitable for growing chickpeas.
- Chickpea is widely grown across the highlands and semi-arid regions of Ethiopia and serves as a multi-purpose crop.
 - Considered as the secondary centre of diversity for chickpea.
- Being exported to Asian countries and is contributing positively to the country's foreign exchange earnings.
- Currently, chickpea is cultivated in four regions of the country, Amhara, Oromia, Southern Nations, Nationalities and People's Region (SNNPR) and Tigray. Amhara and Oromia regions together produce 93% of total chickpea production in Ethiopia while SNNPR and Tigray produce 3.5% and 3%, respectively.
- The area coverage and the importance of the crop in the country are expected to increase in the future.
- More than Ten improved chickpea varieties have been released.
 - But, insufficient seed production has limited the availability of quality seeds and the adoption of improved varieties.
- Various initiatives have been started to accelerate the adoption of improved chickpea varieties in Ethiopia.
 - The Ethiopian Institute of Agricultural Research (EIAR)
 - The Debre Zeit Agricultural Research Centre (DZARC) started work on chickpea research in 1972
 - Amhara Regional Agricultural Research Institute (ARARI) and the Oromiya Regional Research Institute (ORARI).
 - The International Center for Agricultural Research in Drylands (ICARDA) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) provided genetic materials used in the breeding program, elite materials ready for release and technical assistance in the entire breeding cycle.
- Most of this research has focused on identifying high yielding and disease resistant varieties suitable for the diverse agro-ecologies of Ethiopia.
- The Tropical Legumes II (TLII) development program has conducted various chickpea research and development activities, including the establishment of seed grower associations

Major chickpea producing countries (2014-2016)



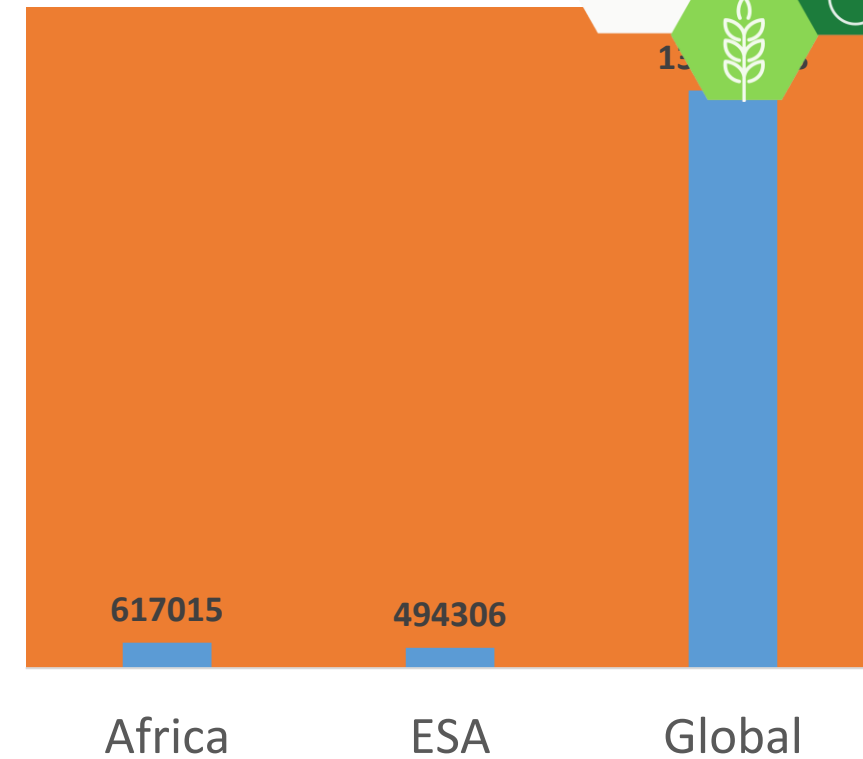
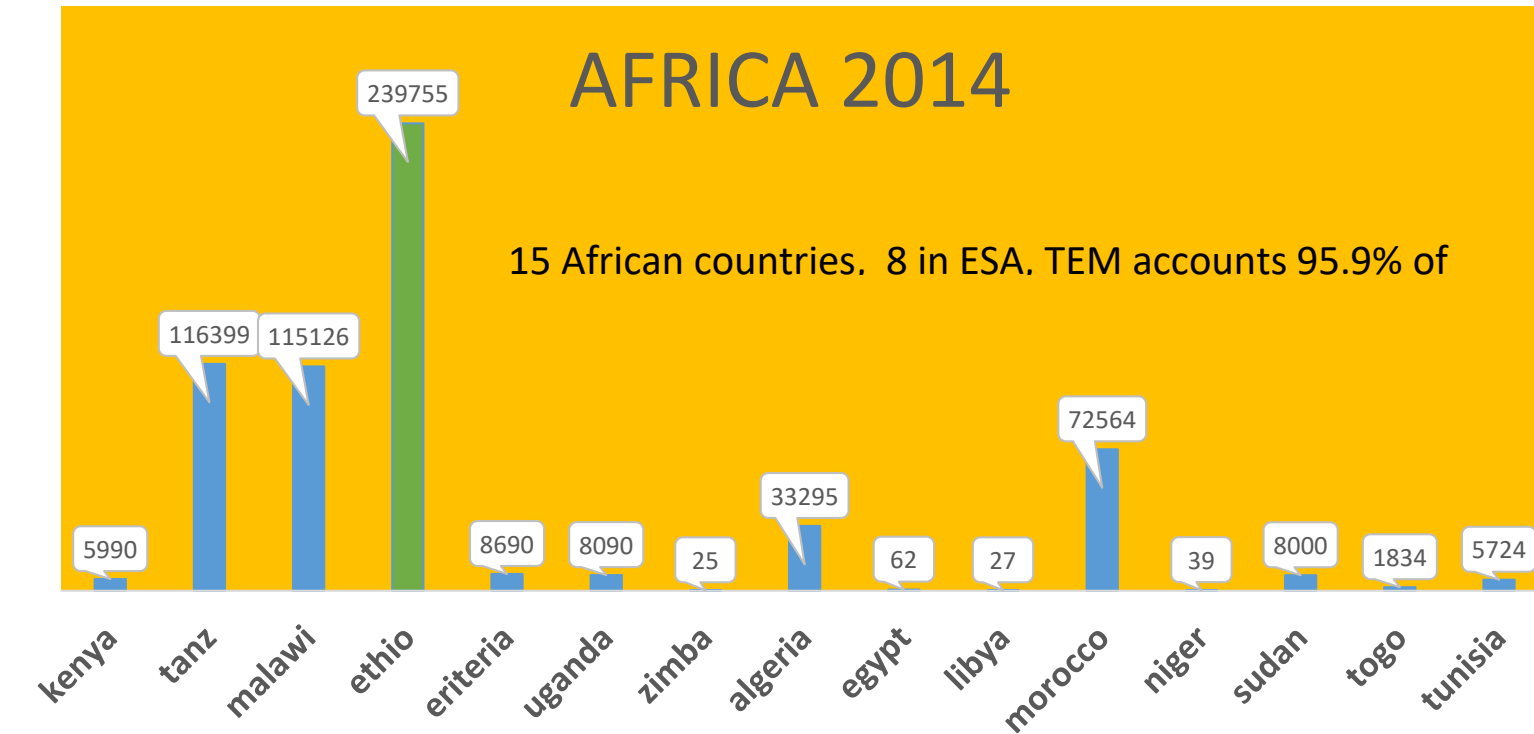
Area



Production

Background - Ethiopia

8 out of 15 countries in Africa are located in ESA and accounts for >95% of chickpea in the continent (~50

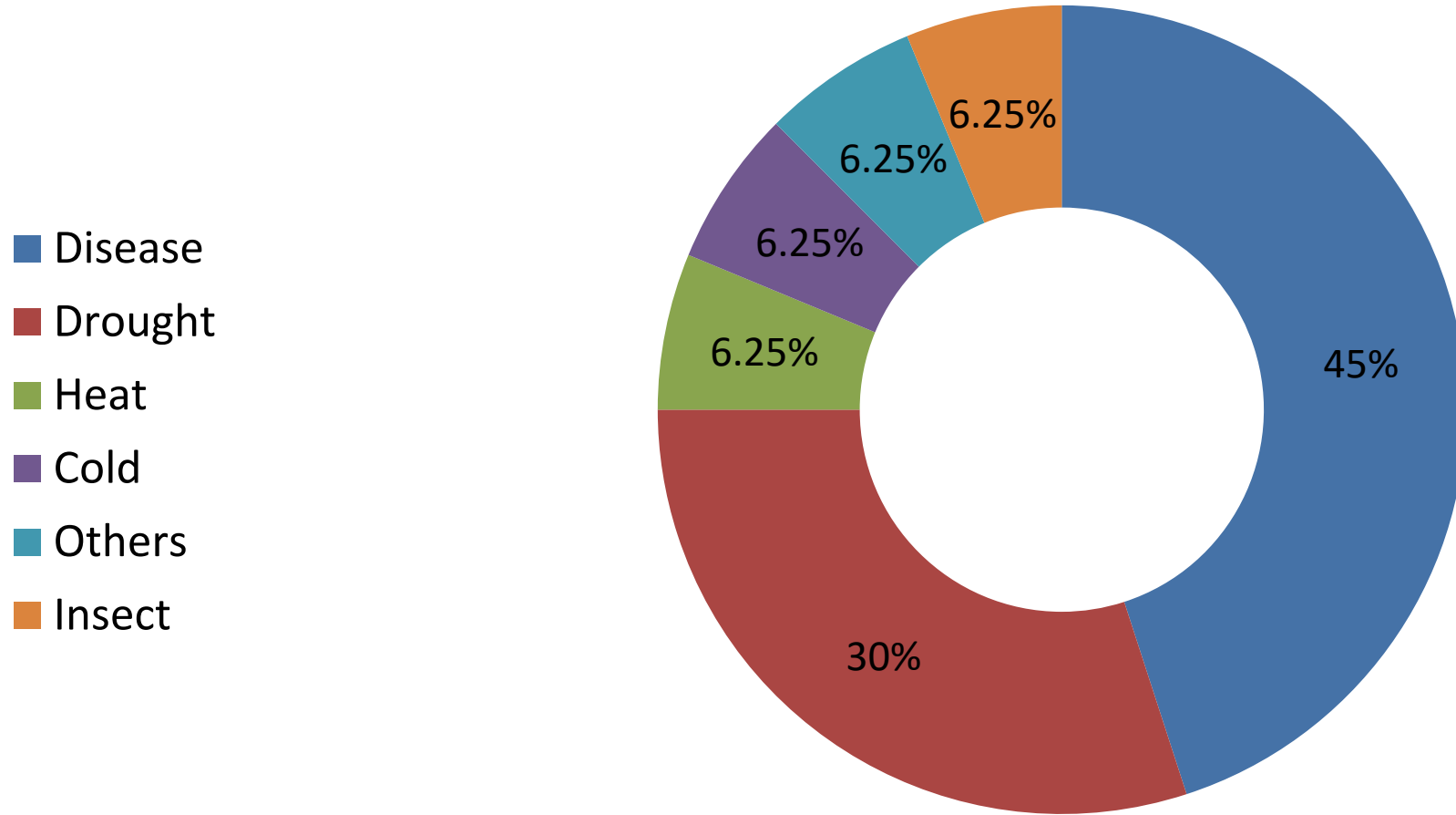


~~Despite its relevance in~~

- Climate resilience/ standing
- Nutritional gap filling
- Cropping system intensification
- Home economic rehabilitation
- Sustainability of agriculture, there is big gap in technology, intervention, input and promotion system of chickpea in ESA and in Ethiopia



Major production limiting chickpea factors for stagnant growth of yield

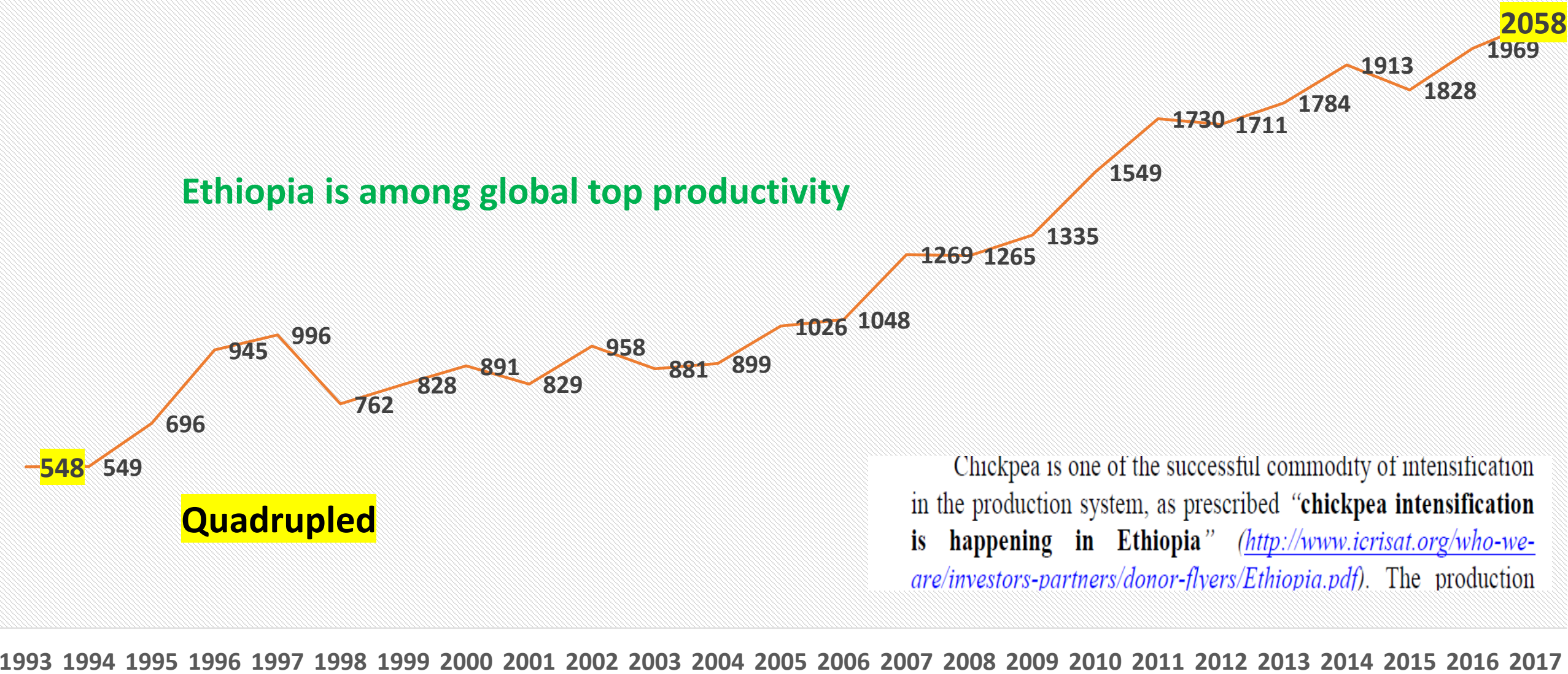


Singh et al 1994a

Yield kg/ha= *yield gain of 60.4kg/ha/yr*

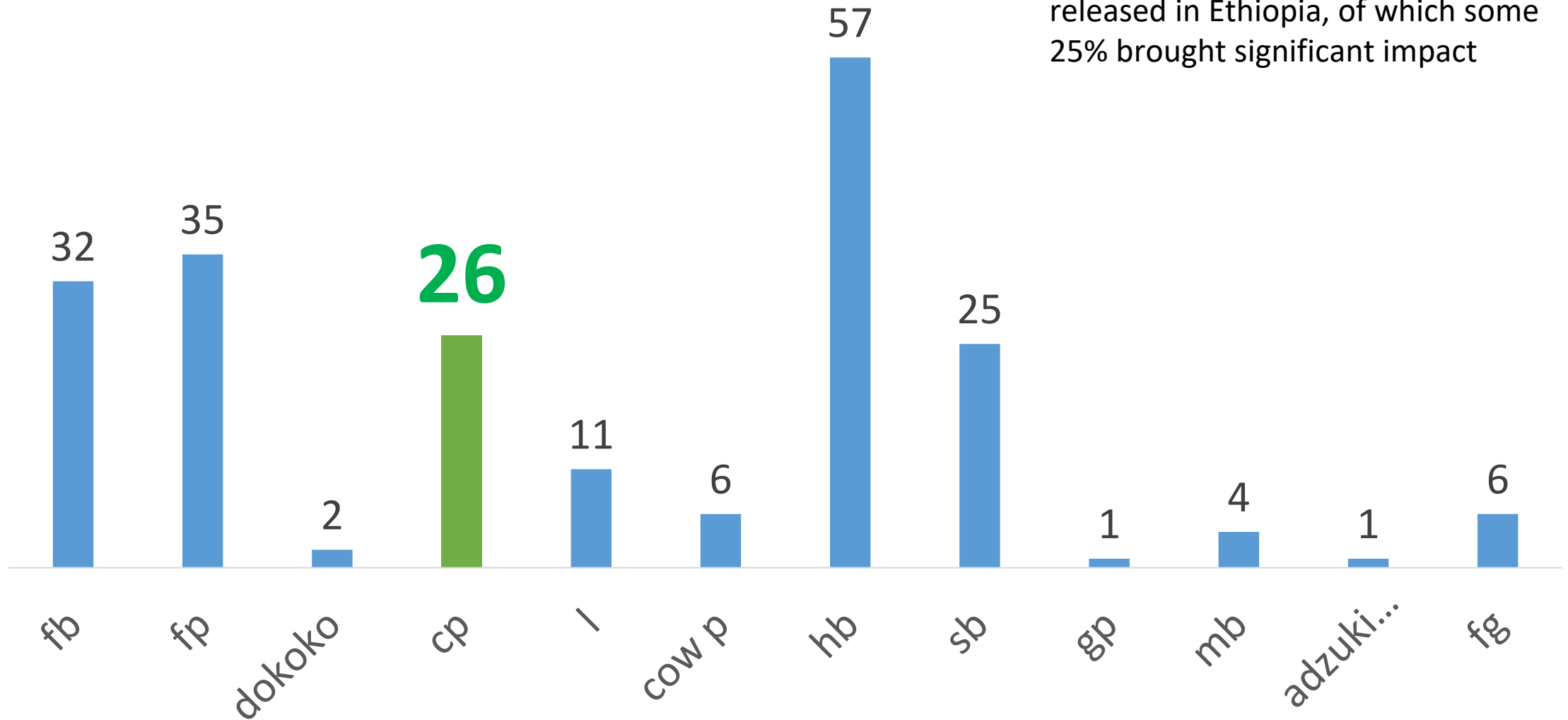
Ethiopia is among global top productivity

Quadrupled

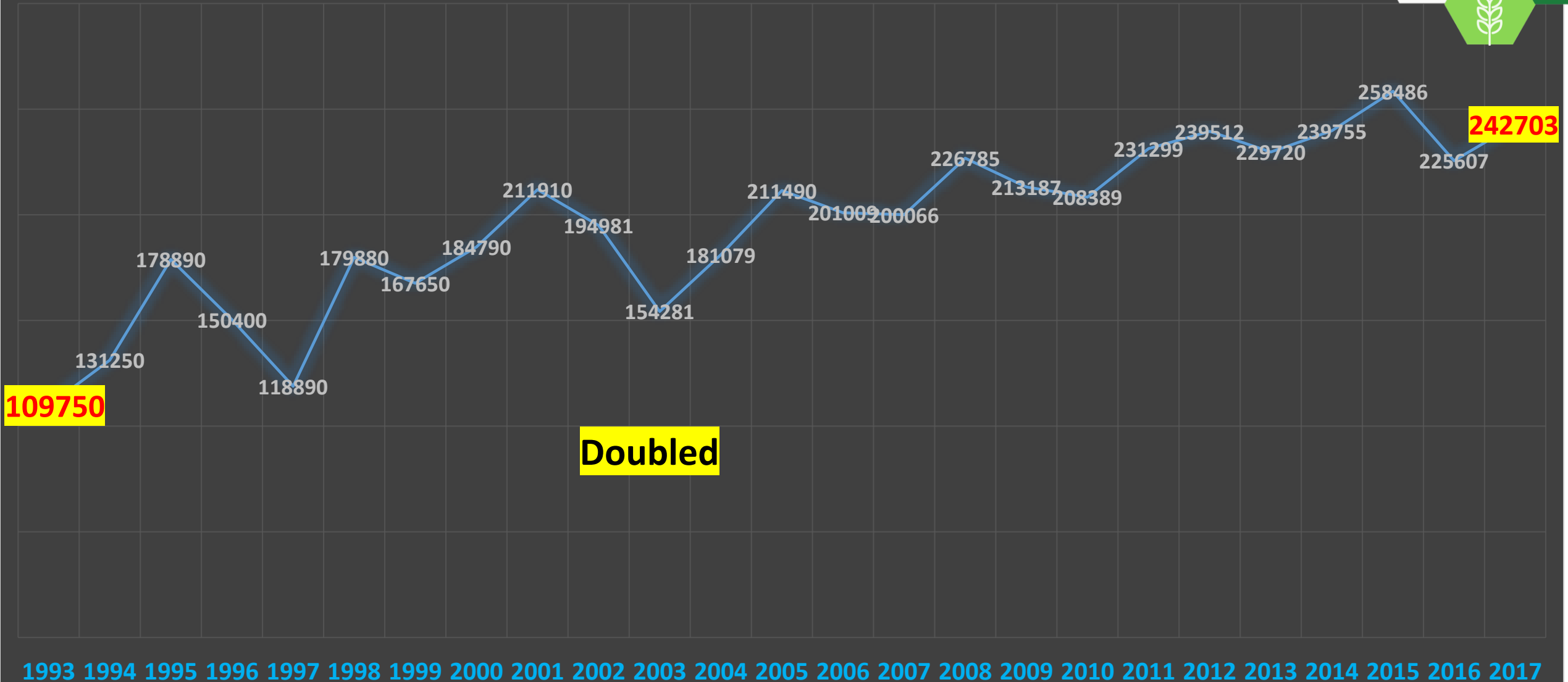


Technology/variety development rate 1970s-2016

Total of 206 legume varieties released in Ethiopia, of which some 25% brought significant impact



area in ha



Impacts of Chickpea Research in Ethiopia



Impacts Survey Results

(21 district-84 PAs-1470 hh= ~80%)

- Kabuli varieties are predominantly high yielding in Ethiopia
- East Gojjam, South West Shewa, Eash Shewa and North Shewa are the major improved chickpea growing zones.
 - Over 60% of farmers in these zones are growing improved chickpea.
- The econometric results show that the growing of improved chickpeas is associated with a 28.5% increase in productivity.
- DNA finger printing data is also collected as a way to verify that farmers are actually growing what they say they are growing.
 - This data is still being analyzed

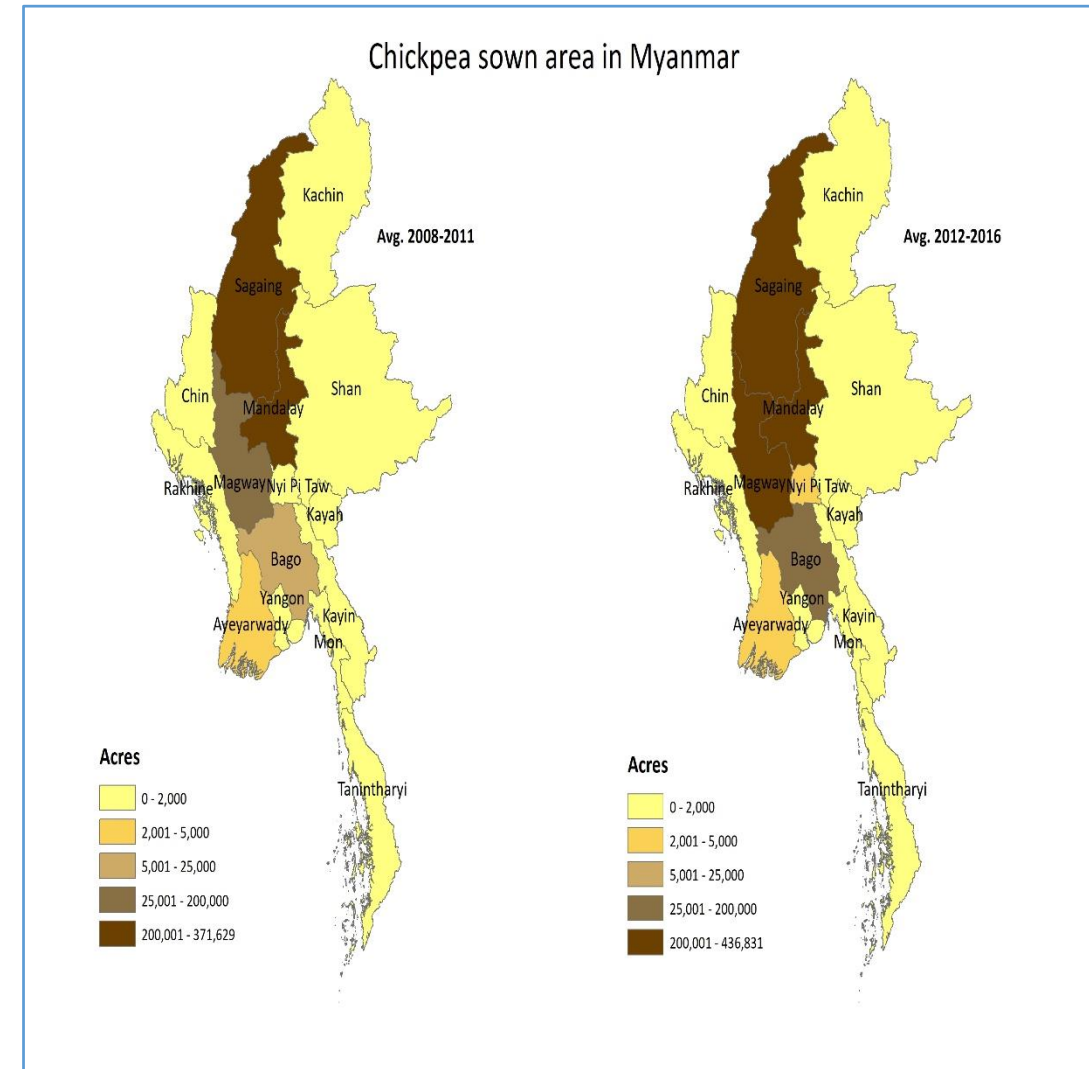
Impacts of early maturing chickpea improved cultivars in Myanmar



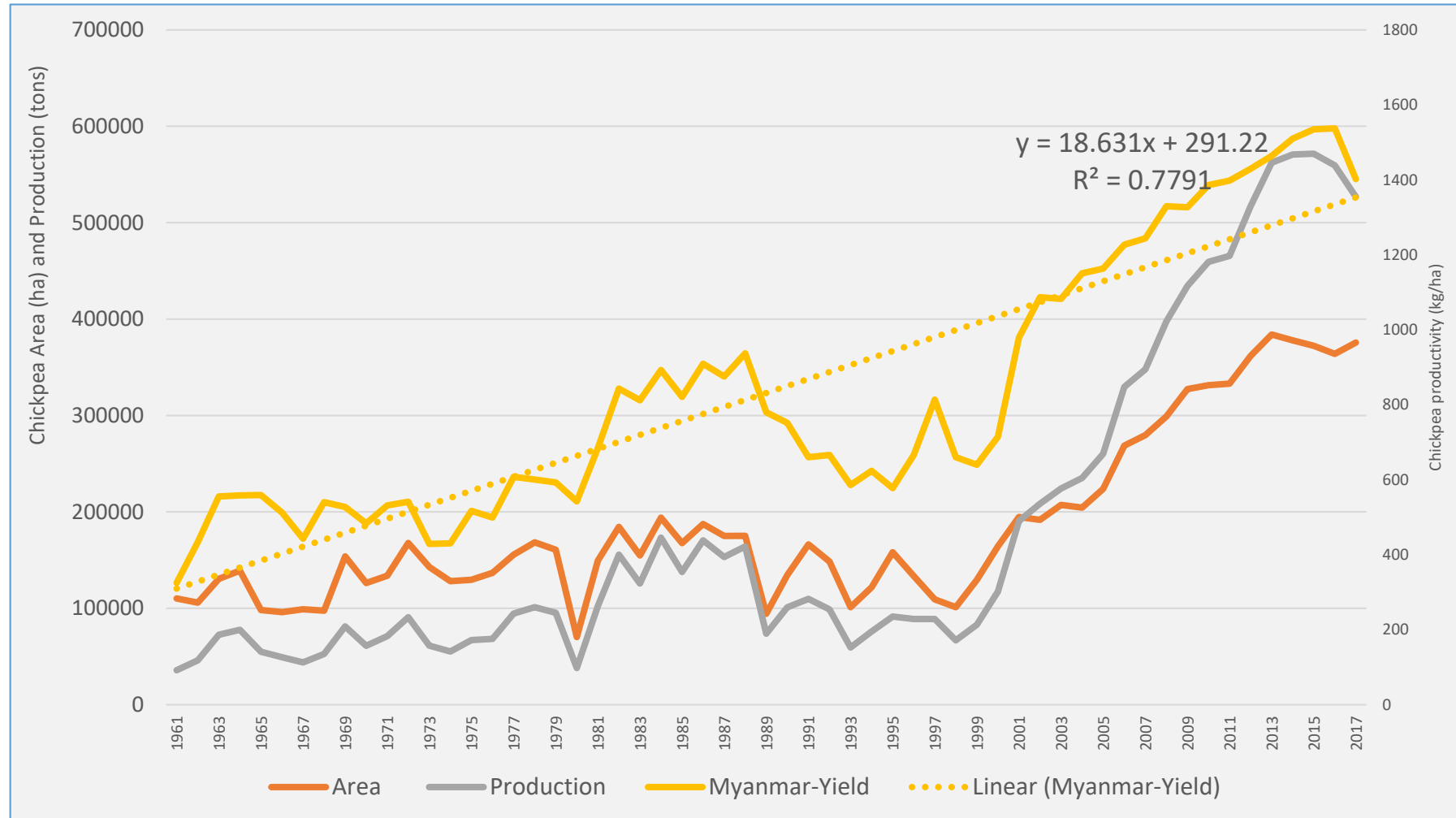
Kumara Charyulu D, Kizito Mazvimavi, Pooran Gaur and Mar Mar Win

Ex-post impact assessment study

- ✓ It is compelling to systematically document the success and quantify welfare benefits
- ✓ A representative tracking survey undertaken covering three regions (Mandalay, Magway and Sagaing) and 403 Hh
- ✓ FGDs conducted to complement the primary surveys
- ✓ Productivity gains and unit cost reductions were estimated

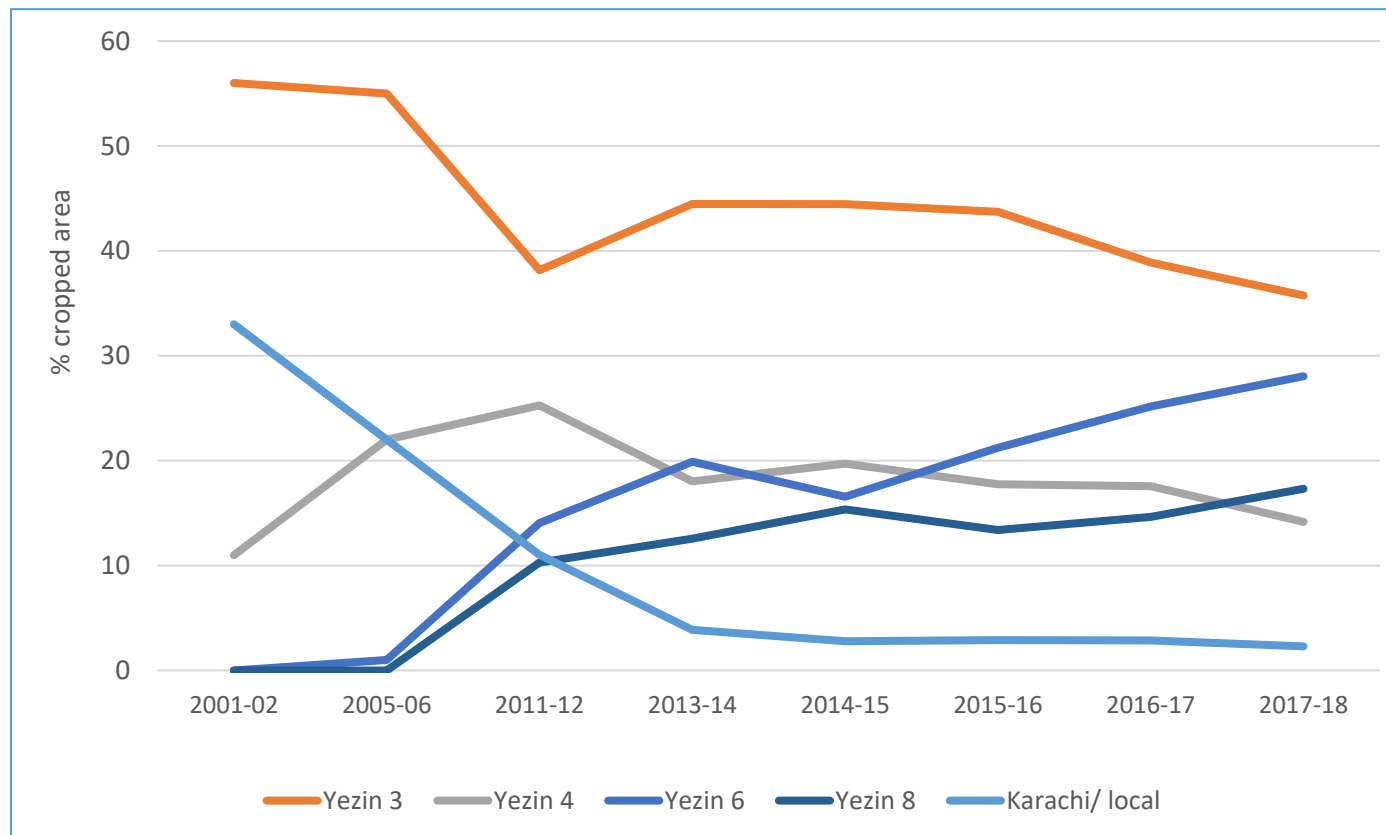


Performance of chickpea in Myanmar



- ✓ Second largest producer in South Asia
- ✓ 3.3 times expansion in area (1961-2017)
- ✓ 15.5 times increase in production
- ✓ Five times enhancement in productivity

Pattern of diffusion of chickpea improved cultivars



- ✓ Area under local land races have come down significantly
- ✓ Yezin 3 (kabuli) is replaced by new cultivar Yezin 8
- ✓ Yezin 4 (desi) is replaced by new cultivar Yezin 6
- ✓ Overall, area under improved cultivars has increased from 67% to 97.7% between 2001-2018
- ✓ Among three regions, Sagaing has peak levels of adoption (>98%) followed by Mandalay (>96%) and Magway (>94%)



How improved chickpea varieties are changing farmers' lives in Myanmar

SITUATION IN 2000



Chickpea in Central Dry Zone, Myanmar



Heat stress



Drought



<750 mm/year rainfall



Subsistence crop:
700 kg/ha



RESEARCH
PROGRAM ON
Grain Legumes



INTERVENTION

7 Early-maturing chickpea varieties tolerant to drought, heat and Fusarium wilt developed



Yezin 3 Yezin 5 Yezin 8 Yezin 11



Yezin 4 Yezin 6 Yezin 12

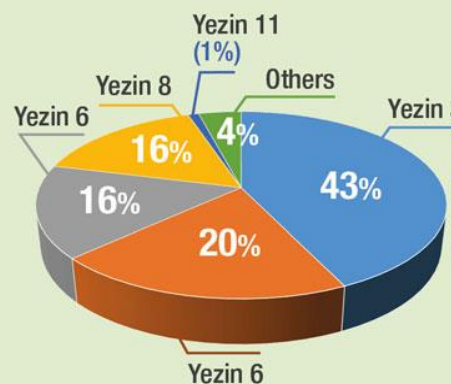
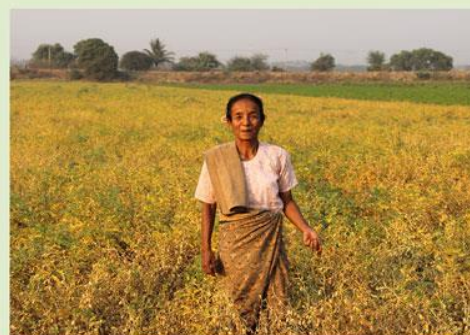
Farmers gain access to better seeds

Farmers trained on improved agricultural practices



RESULT

High rate of adoption by farmers
>160,000 farmers benefited

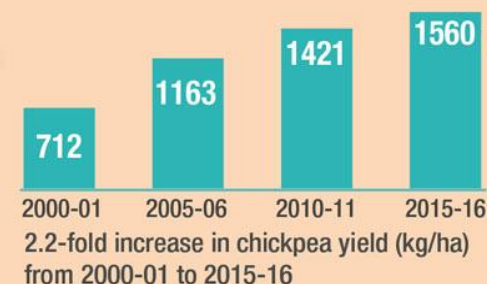


96% of the chickpea area in Myanmar under five of these varieties

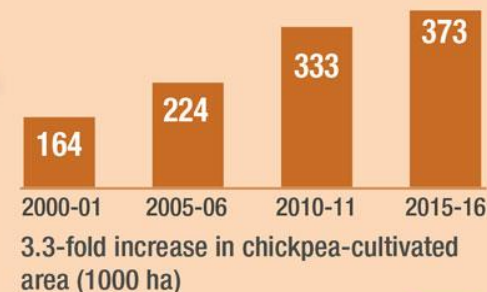


IMPACT

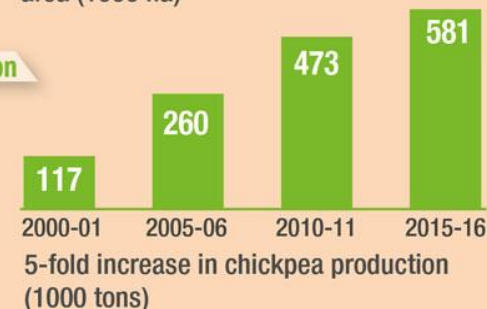
Yield



Area



Production



Myanmar now an important chickpea-exporting country

Average annual export
47,500 tons
US\$ 24 million



Key findings of the study

- ✓ Rapid adoption of early maturing chickpea improved cultivars in the country brought a **salient chickpea revolution** during last two decades period
- ✓ **Ten out of eleven chickpea** improved cultivars released in the country were based on ICRISAT sourced breeding material
- ✓ The extent of adoption of early maturing chickpea improved cultivars in the country was at **its peak at 97.7%**
- ✓ The productivity gain due to adoption new improved **cultivars was 51%**. The estimated unit cost reduction due to improved technology was **\$ 129 per ton**
- ✓ The accrued welfare benefits in Myanmar due to rapid of early maturing chickpea improved cultivars were estimated at **\$ 152.8 million**



Identification of priority IA studies



- Criteria to enable screening different research projects for priority IA studies.
 - Is the research developed or attributed to ICRISAT?
 - Has intervention taken off in terms of adoption?
 - Relative size of potential benefit of adoption of the technology.
 - Are there any prospects for documenting impacts along the impact pathway?
 - Uniqueness of the Impact Assessment Study.
 - Geographic coverage of the research project.

Way forward

- The costs of conducting an ex-post impact assessment in a specific geographic location depends on the breadth of questions, and how much precision is desired.
- This will decide the budget for the proposed Impact Assessment strategy to be implemented in the next 2 years, 2019-2020.
- There is need for strategic investment from the institute and supported by related bilateral projects to support IAO in conducting studies.
- Pursue funding from SPIA and other funders (FAO) for specific projects.
- Decision on the housing of IAO



Thank You



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ICRISAT is a member of the
CGIAR System Organization