



TASAI
THE AFRICAN SEED ACCESS INDEX



Ghana Brief 2017 - The African Seed Access Index

**Edward Mabaya
Samuel Yao Adzivor
John Wobil
Mainza Mugoya**

December 2017

Ghana Brief 2017 – The African Seed Access Index

INTRODUCTION

A competitive seed sector is key to ensuring timely availability of high quality seeds of improved, appropriate varieties at affordable prices for smallholder farmers in Ghana. This country brief summarizes the key findings of The African Seed Access Index (TASAI) study conducted in 2016/17 to appraise the structure and economic performance of Ghana's seed sector. With a focus on four grain and legume crops important to food security — maize, rice, soya bean, and cowpea — the study evaluates the enabling environment for a vibrant formal seed sector. Maize, rice, and cowpea are three of the five priority food crops for attaining food security in Ghana, as recognized in the Food and Agriculture Sector Development Policy (FASDEP II) (Ministry of Food and Agriculture, 2007). Soya bean is also mentioned as a cash crop with industrial properties. Furthermore, the cultivation of these four crops covers about 32% of the country's arable land (FAOSTAT, 2017). The study covers 20 indicators divided into the following categories: Research and Development, Industry Competitiveness, Seed Policy and Regulations, Institutional Support, and Service to Smallholder Farmers. [Appendix 1](#) summarizes all 20 indicators and compares Ghana to 12 other countries where the TASAI research has been conducted. TASAI seeks to encourage public policymakers and development agencies to create and maintain enabling environments that will accelerate the development of competitive formal seed systems serving smallholder farmers.

Overview

Like most other African countries, the seed industry in Ghana consists of two systems: the informal sector and the formal sector. This policy brief focuses almost exclusively on the formal seed sector.

The informal sector broadly refers to the system where farmers produce, obtain, maintain, and distribute seed resources from one growing season to the next (FAO, 1998). Due to limited exposure, low availability of most varieties, inability to purchase seeds, limited access to agro-dealers, or other reasons, most smallholder farmers in Ghana still rely significantly on the informal system. Standards in the informal seed sector are not monitored or controlled by government policies and regulations; rather, they are guided by indigenous knowledge and standards, and by social structures. The colloquial nature of transactions means that there is scant performance data on the informal sector.

The formal sector focuses on breeding and evaluating improved varieties, and producing and selling seed of these varieties that are certified by the Plant Protection and Regulatory Services Directorate (PPRSD), the government department under the Ministry of Food and Agriculture (MOFA) responsible for regulating seed in Ghana. According to the Ghana National Seed Plan (Ministry of Food and Agriculture, 2015), certified seed contributes only about 11% and 14% of the national seed requirement for maize and rice, respectively. As shown in Table 1, Ghana's formal seed sector comprises numerous institutions, including government (e.g. GSID, GLDB, CRI, SARI, and district extension agents), private sector (mostly local seed companies and agro-dealers), and development agencies. Established in November 2015, the National Seed Trade Association of Ghana (NASTAG) is a new association that brings together all the seed companies and other key players in the industry.

Table 1: Role of key players in Ghana's formal seed sector

ROLE	KEY PLAYERS
Research and breeding	CRI, SARI, West Africa Centre for Crop Improvement, universities, IITA
Variety release and regulation	National Variety Release and Registration Committee
Seed production and processing	Seed companies, GLDB, LCIC (foundation seed only)
Education, training, and extension	Seed companies, NASTAG, GSID, PPRSD, CRI, SARI, Department of Agricultural Extension Services
Distribution and sales	Seed companies, agro-dealers

Key acronyms: APSP – Agriculture Policy Support Project; CRI – Crop Research Institute; ECOWAS – Economic Community of West African States; GLDB – Grains and Legumes Development Board; GSID – Ghana Seed Inspection Division; IITA – International Institute of Tropical Agriculture; MOFA – Ministry of Food and Agriculture; NASTAG – National Seed Trade Association of Ghana; OPV – Open Pollinated Variety; PPRSD – Plant Protection and Regulatory Services Directorate; SARI – Savanna Agricultural Research Institute.



Number of active breeders

For the four priority crops in Ghana – maize, rice, soya bean, and cowpea – there are 26 active breeders. Of these, 15 breeders are from the two public research institutions – the Savanna Agricultural Research Institute (SARI) and the Crop Research Institute (CRI). SARI has the mandate for the four crops in northern Ghana, while CRI has the mandate for the same crops in southern Ghana. Nine of the breeders represent two private companies. One of the private companies produces only foundation seed, while the other private company releases its own varieties in collaboration with CRI. The remaining two breeders are from the West Africa Centre for Crop Improvement, a partnership between the University of Ghana and Cornell University (USA). The number of breeders for each crop are as follows: ten for maize, six for rice, five for soya bean, and five for cowpea.

On average, seed companies' satisfaction with the number of active breeders is good (73%).¹ The highest level of satisfaction is for maize (83%) and cowpea (80%), while the lowest levels satisfaction were reported for rice (70%) and soya bean (60%). The number of breeders is fairly even across the four crops. However, the relatively low levels of satisfaction with the adequacy of soya bean breeders signals the need to increase the number of breeders.

Varieties released in the last three years

Between 2013 and 2015, eight new varieties were released for the four crops. Of these, six were for maize and two for rice. While there were no releases of cowpea and soya bean varieties during this period, three soya bean and three cowpea varieties were released in 2012. Figure 1 shows the three-year moving average of variety releases since 2003. Given the number of active breeders, the number of varieties released for the crops is relatively low. According to multiple sources, the main reason for the small number of varieties released is a lack of financial resources. Public breeding programs are under-funded by the government, and largely dependent on external (donor) funding.

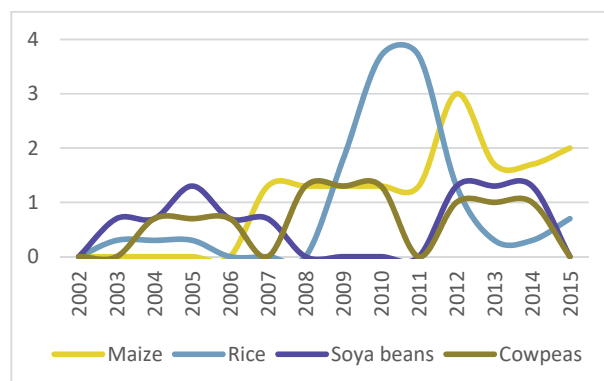


Figure 1: Number of varieties released in Ghana (three-year moving average)

Availability of foundation seed

On average, seed companies rate their satisfaction with the availability of foundation seed as good (67%). The highest satisfaction is for maize (70%), while the lowest satisfaction is for rice (62%). The satisfaction ratings for the availability of foundation seed for cowpea and soya bean are the same (68%).

The main sources of foundation seed for the four crops are the government parastatal, the Grains and Legumes Development Board (GLDB), and the agricultural research institutions – CRI and SARI. GLDB provides maize foundation seed to about one-third (32%) of seed companies in Ghana. SARI is the source of rice foundation seed for 40% of the seed companies. One private research company, the Legacy Crop Improvement Centre (LCIC), produces foundation seed for maize, cowpea and rice. These findings are consistent with a recent study on early-generation seed in Ghana (AGRA, 2016), which found a significant shortage in the supply of foundation seed and other early-generation seed. This is caused by a lack of financial resources at government research institutions (mainly CRI and SARI) and a lack of private sector breeding programs.

Average age of varieties sold

The average ages of the varieties currently on the market are as follows: 12.5 years (maize), 5 years (rice), 8.5 years (soya bean), and 14 years (cowpea). Maize OPV variety *Obatanpa* (released in 1992) is the oldest variety on the market. As of 2014, it accounted for 77% of certified maize seed production (AGRA, 2016), because farmers like its attributes and because new maize varieties released in 2015 are not being promoted as much as

¹ All scores reported in this brief are based on industry self-reporting of satisfaction ranging from 0% (completely dissatisfied) to 100% (completely satisfied).



Obatanpa. In contrast, the rice varieties on the market are relatively young. This may be due to the current demand for rice varieties with aromatic cooking qualities, which has encouraged breeders to release new varieties to replace the old ones. The main reason for the relatively young age of soya bean varieties (average 8.5 years) is that commercial cultivation of the crop in Ghana began less than 20 years ago.

Varieties with climate-smart features

To be classified as climate-smart, a crop variety must meet at least one of two criteria – early maturity and/or tolerance to extreme weather conditions such as drought, flooding, or frost. Six varieties of maize were released in 2015, of which four have climate-smart characteristics. *Warikamana*, *Kunlor-wari*, *Suhudoo*, and *Kpari-faako* maize varieties, developed by the International Institute of Tropical Agriculture (IITA), are early-maturing and tolerant to drought. For rice, soya bean, and cowpea, no varieties with climate-smart features were released in the past three years.

INDUSTRY COMPETITIVENESS

Number of active seed companies

In 2016, there were 17 seed companies engaged in the production and/or marketing of at least one of the four focus crops. All the companies produced maize seed. Of the 17 companies, seven produced rice, five produced soya bean, and nine produced cowpea. The seed industry was privatized in 1989, though most seed companies are less than 10 years old. It is worth noting that several young companies have been started with support from donor-funded projects.

The estimated aggregate sales of the four crops in 2016² was 1,832 metric tons. Maize seed accounted for about 78% (1,432 tons) of 2016 sales of the four crops. This is slightly lower than the 2015 maize seed sales of 2,186 metric tons. The TASAI findings on the volume of maize seed sales are consistent with the findings from the study on early-generation seed, which reported maize seed sales of 2,105 tons in 2015 (AGRA, 2016).

² The data was collected in December 2016, and some companies had not yet consolidated their annual sales figures. In such cases, the researchers assumed the 2016 sales to be the same as 2015 sales, which were reported.

Market share of top seed companies

Market share is calculated using seed sales reported by seed companies. By crop, the market shares for the top four companies are: 72% (maize), 77% (rice), 98% (soya bean), and 87% (cowpea). This data shows that a few companies dominate the market for rice, soya bean, and cowpea (fig. 2). The maize seed market is more competitive.

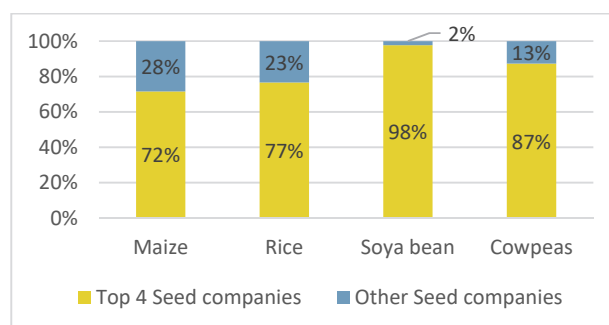


Figure 2: Total market share (%) of top four companies

The Herfindahl-Hirschman Index (HHI) was also used to quantify industry competitiveness. The index, a sum of squared market shares, ranges from near zero for perfect competition, to 10,000 for a pure monopoly. HHI was calculated for all the seed companies, for each crop. The market concentration is good for maize (1,620), fair for rice (2,287) and cowpea (2,798), but poor for soya bean (3,072). The market shares of the top four companies and the HHI results both indicate that the seed market for three crops – rice, soya bean, and cowpea – is dominated by a few players, with fair or poor levels of competition.

Market share of government parastatal

Since September 1989, no government parastatal has been involved in the production and/or marketing of certified seed for any of the four crops.

Length of import/export process for seed

The time it takes to import seed is calculated as the number of days from the time an import permit is applied for to the time the seed is cleared at the border. For the focus crops, there is only one company in Ghana involved in seed importation. The company indicated that the importation process takes about 90 days. Imports are mainly from South Africa (for maize and soya bean) and India



(rice). The seed company signaled a low level of satisfaction (20%) with the import process, primarily due to unclear legal and regulatory requirements for importation (that is, what can or cannot be imported), the quantities allowed for import, and the time for processing import permits. In 2016, there were no exports of certified seed from Ghana for any of the four crops.

SEED POLICY AND REGULATIONS

Length of variety release process

The length of the variety release process is the duration of time from when the application for a variety release is submitted to when the variety is released by the relevant authority. In Ghana, crop variety release is the mandate of the National Variety Release and Registration Committee.

Only two seed companies reported releasing varieties in Ghana between 2013 and 2015. The average release time across crops was 42 months. By crop, release time varied from 36 months for rice, soya bean, and cowpea, to 60 months for maize. The main causes for the long release time were delays during on-site trials, delayed committee meetings, and delays in setting a date for presenting the findings to the committee. According to the seed regulations, the stipulated time for release should be between 12 and 24 months. On average, the two seed companies rate their satisfaction with the release time as fair (43%). By crop, the satisfaction is rated as fair for maize and rice (55%), and poor for soya bean and cowpea (30%). It is important to note that the two seed companies expressed different opinions in their satisfaction of the release time for maize. One of the seed companies, whose release time was 84 months, was very dissatisfied with the process (30%). The other seed company, whose release time for maize was only 36 months, was satisfied with the process (80%). This wide disparity shows inconsistencies in the variety release process.

Status of seed policy framework

The current Ghana National Seed Policy took effect on 1st August, 2013. In 1991, a MOFA Task Force reviewed the Seeds (Certification and Standards) Regulations Decree of 1972 and made recommendations on the rules and regulations pertaining to the operations of the seed industry in view of its new, privatized structure. The Plants and Fertilizer Act, 2010 (ACT 803) was passed by parliament

and assented to by the President on 6th September 2010. The Act, which is in three technical parts, provides for Plant Protection (Part One), Seeds (Part Two), and Fertilizer Control (Part Three).

Ghana's seed (certification and standards) regulation has been aligned with the seed regulations of the Economic Community of West African States (ECOWAS). However, the ECOWAS seed regulations have a broader scope and cover quality control, certification, and marketing, whereas Ghana's regulations cover certification and standards exclusively. It therefore became necessary to re-draft the national seed regulations to incorporate the provisions of the ECOWAS seed regulations. The final document, aligned to the ECOWAS seed regulations, was forwarded to Parliament in December 2015 for ratification. At the time of writing this report, it was yet to be considered by Parliament for enactment.

Quality of seed regulations and enforcement

"Part Two (Seeds)" of the Plants and Fertilizer Act, 2010 (Act 803) is the seed law of Ghana. Seed companies are satisfied with the quality of the seed laws and regulations, rating them as good (78%). However, they are less satisfied with the enforcement of the regulations (56%). One of the weak areas of enforcement highlighted by seed companies is the supply of foundation seed. Regulations have been aligned with ECOWAS protocol, but their passage by Parliament was delayed in 2016. MOFA intends to re-submit the regulations to Parliament for approval in 2017.

Adequacy of seed inspectors

The Ghana Seed Inspection Division (GSID) has a total of 32 seed inspectors distributed in nine of the 10 regions of Ghana where seed production is undertaken. On average, seed companies rate their satisfaction with seed services as fair (49%). The main shortcoming of inspection services is that inspectors have inadequate resources to perform their tasks. To alleviate this challenge, GSID has received support from the United States Agency for International Development under the Agriculture Policy Support Project (APSP) to train 20 GSID seed inspectors on inspection procedures. In addition, APSP has assisted GSID with a review of its certification and accreditation manual, which is awaiting approval by the National Seed Council. The in-



tention is to develop a certification and accreditation system that will allow private seed companies to conduct their own seed inspection services.

Efforts to stamp out fake seed

In total, seed companies reported seven cases of the sale of fake seed in 2016. This figure is likely to be an underestimate as most cases of fake seed are not officially reported. On average, seed companies are not satisfied with the government's efforts to stamp out fake seed, rating them as poor (32%). According to the seed companies, the main sources of fake seed are agro-dealers and other seed companies. Some seed companies highlighted that inadequate knowledge of the Plants and Fertilizer Act, 2010 (ACT 803), and its regulation by some law enforcement agencies, such as the police and customs officials, hampers successful prosecution of offenders.

INSTITUTIONAL SUPPORT

Availability of extension services

There are an estimated 2,511 agricultural extension workers in Ghana, 15% of whom are female. Most of the extension workers (2,484) are employed by the government under the Directorate of Agricultural Extension Services. Only 27 extension workers are in the private sector, employed mainly by seed companies. According to Ghana's national seed plan (MOFA, 2015), the ratio of extension worker to farmer is 1:1500. This is considerably lower than other African countries, for example, Ethiopia (1:592) and Kenya (1:910). There is a clear need to invest more in the quantity and quality of the extension services in Ghana, as this would promote adoption of improved seed and good farming methods. It would also result in more favorable ratings by seed companies, who currently rate their satisfaction with the extension services as fair (52%).

Quality of national seed trade association

The National Seed Trade Association of Ghana (NASTAG) is the umbrella association for all seed trade stakeholders in Ghana. It was formed in November 2015 and is currently run by interim executive officers. NASTAG is made up of the Seed Producers Association of Ghana, Seed Traders Association of Ghana, Ghana Agro-input Dealers Association, CRI, and Croplife, Ghana.

Seed companies rate their satisfaction with the overall quality of NASTAG as fair (46%). The low score is mainly because NASTAG is still a young organization without a fully-functioning secretariat and a board of directors. Figure 3 illustrates the seed companies' level of satisfaction with NASTAG's performance in six service areas. NASTAG's highest rating is in democracy and governance (64%), while the lowest rating is in its ability to mobilize resources (36%). NASTAG's members rate the association as poor (38%) in providing value to members. All the other service areas, such as managerial ability, effectiveness in advocacy and activity, and activity on important seed sector issues are rated as fair (between 43% and 46%).

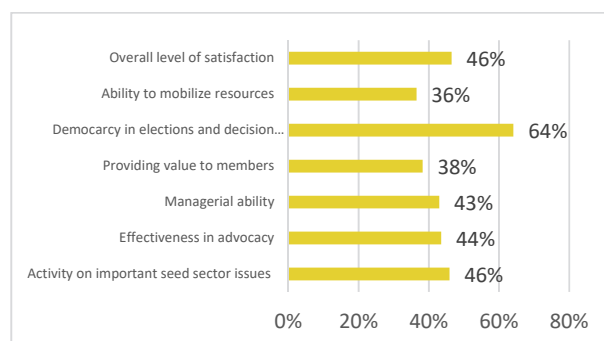


Figure 3: Members' satisfaction with NASTAG (Source: TASA Survey)

SERVICE TO SMALLHOLDER FARMERS

Concentration of rural agro-dealer network

According to the updated Directory of Ghana Agri-Input Dealers (AGRA, 2012), there are 3,153 agro-input dealers across Ghana. This translates to a ratio of one agro-dealer for approximately every 794 agricultural households in Ghana. Of the total number of agro-dealers, 83% (2,388) have been trained. Most of the trained agro-dealers (83%) are male. These agro-dealers stock seeds and other agricultural inputs like fertilizers and chemicals. There are notable efforts to improve the capacity of agro-dealers in Ghana. One of these efforts, supported under APSP, builds the capacity of agro-dealers to address the issue of counterfeit seeds. Seed companies rated their satisfaction with the agro-dealer network as good (64%). There is no recent census of agro-dealers in Ghana to update the above statistics.

Availability of seed in small packages

For the four crops collectively, 66% of the seed was sold in packages of 2 kg or less. This is a high proportion, but there is significant variation across the four crops, as



shown in Figure 4. The amount of seed sold in small packages ranges from the 74% for maize to 14% for soya bean, with cowpea (42%) and rice (29%) in the middle. Most soya bean seed (79%) is sold in package sizes of at least 25 kg. The large package size could be an impediment for variety adoption by smallholder farmers, who are more likely to experiment with new varieties only if they can purchase them in small volumes.

The seed companies' satisfaction with availability of seed in small packages is positively correlated with the volumes sold in small packages. On average, seed companies rate their satisfaction with the volumes of seed sold in small packages as good (72%). The companies are more satisfied with volumes seed sold in small packages for maize (81%) and rice (74%), than for soya bean (65%) and cowpea (50%). The certification tag provided by PPRSD is usually one tag per 50 kg bag. Thus, much of the seed sold in small packages is seed that has been re-bagged and does not have the certification tag.

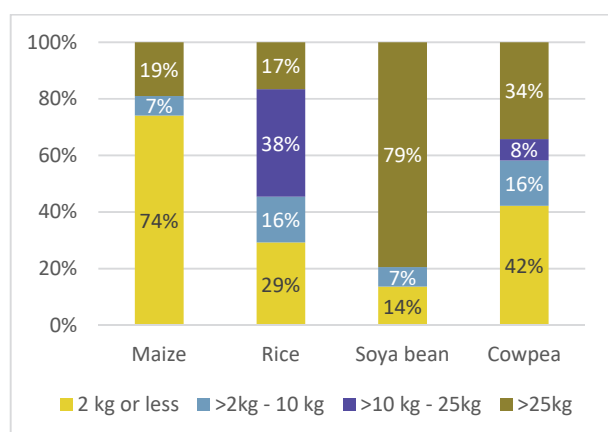


Figure 4. Percentage of seed sold in different package sizes

Seed-to-grain price ratio

Assuming stable prices at planting time, seed-to-grain price ratios can reflect the attractiveness of a variety or affordability of improved seed relative to grain recycled by the farmer. The seed-to-grain price ratios for the four crops do not vary significantly. The highest ratios are for hybrid maize (6.06:1). The seed-to-grain price ratios for maize OPV is 4:28:1, for soya bean 4.4:1, for rice 1.66:1, and for cowpea 2.03:1. These ratios are comparable with other African countries, such as Ethiopia and Zimbabwe, where the ratios for maize hybrids are 7.1:1 and 9.3:1, respectively.

OPPORTUNITIES AND CHALLENGES

Despite its relatively young age, Ghana's seed industry has reason for optimism. The key policy instruments, namely the National Seed Policy and Plants and Fertilizer Act, are less than eight years old, and the amended regulations are soon to be passed by the Parliament. In addition, the newly-formed NASTAG has the buy-in of most industry players, and is therefore a good platform to ensure that seed companies are well-represented in relevant policy discussions.

These positives notwithstanding, Ghana's formal seed sector faces some formidable challenges. Only eight varieties (for all four crops) were released during the past three years. This shows a low level of investment by both the public and private sectors in varietal development. Despite being part of the ECOWAS regional seed harmonization arrangements, the level of seed trade in Ghana is low. For the four crops, only one seed company imports seed into Ghana. The low level of regional trade partly contributes to the low volumes of certified seed sold in the country (less than 2,000 metric tons in 2016). Despite the amended seed legislation and regulations, seed companies continue to face operational challenges. Most notable is the long duration of variety release time (60 months for maize), which discourages investments in breeding.

CONCLUSION

The seed industry in Ghana is in the early-growth stage and there is significant room for greater participation by the private sector. While there are many companies producing and/or marketing maize and rice seed, the volumes are still very low. There are opportunities for regional trade under the ECOWAS seed harmonization arrangements. To increase adoption rates among farmers in Ghana, seed companies should promote some of the new seed varieties – especially for maize and rice, which are higher-yielding and have more climate-smart characteristics. In addition, companies may have to reduce package sizes for soya bean and cowpea to make the seed more attractive and economically viable for small farmers.

To address the challenges in the seed sector, strategic interventions are needed at various critical stages including: investment in research and breeding; improving seed companies' access to foundation seed; improving the performance of the National Variety Release and Registration



Committee to reduce the length of time it takes to register a variety; and addressing the problem of fake seed, among other issues.

REFERENCES

AGRA (2016) *Ghana Early Generation Seed Study*.

FAOSTAT (2017) *FAOSTAT*. Available at: <http://www.fao.org/faostat/en/#home> (Accessed: 1 July 2017).

Ministry of Food and Agriculture (2015) *NATIONAL SEED PLAN*. Available at: [http://tasai.org/wp-content/themes/tasai2016/info_portal/Ghana/GhanaNationalSeedPlan\(2015\).pdf](http://tasai.org/wp-content/themes/tasai2016/info_portal/Ghana/GhanaNationalSeedPlan(2015).pdf) (Accessed: 7 August 2017).

Ministry of Food and Agriculture, G. (2007) *Food and Agriculture Sector Development Policy (FASDEP II)*. Available at: <ftp://ftp.fao.org/TC/TCA/WEB/FTP/TC/TCA/CAADP/TT/CAADPImplementation/CAADPPrecompact/Nationaldocuments/Ghana/AgricultureandFoodSecurityStrategy.pdf> (Accessed: 7 August 2017).

APPENDIX 1.

For a comparison of TASAI Indicators across 13 countries, please visit: <http://tasai.org/wp-content/uploads/TASAI-Appendix-CURRENT.pdf>





For more information, contact:

info@tasai.org

www.tasai.org

Follow us on Twitter: **@TASAIIndex**

Find us on Facebook: **The African Seed Access Index**

Suggested citation:

Edward Mabaya, Samuel Yao Adzivor, John Wobil, and Mainza Mugoya.
2017. *Ghana Brief 2017 - The African Seed Access Index*. Available at:
tasai.org/reports

The work of TASAI is supported by:

