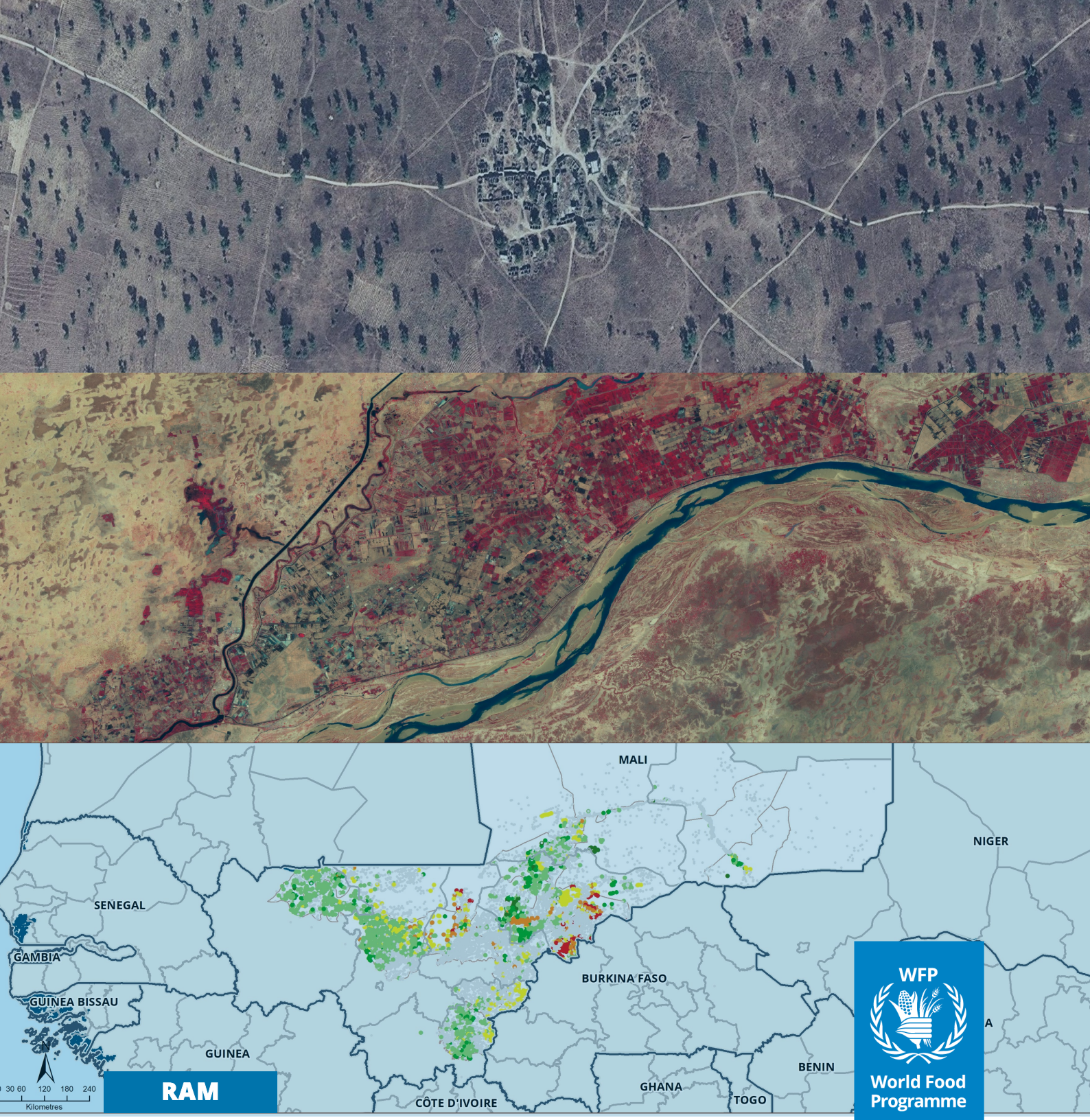

WFP
World Food Programme

SAVING LIVES
CHANGING LIVES

Cropland Change Detection Analysis in Mali

Lessons learned and good practices

May 2023

Acknowledgement

World Food Programme (WFP) would like to extend thanks to colleagues from Ministry of Rural Development of Mali, WFP Mali country office, and other country institutions and agencies who provided valuable experiences and insights that supported the development of this report and further improvement of the analysis methodology. The cropland change detection analysis in West Africa was funded by the European Commission's Directorate-General for European Civil Protection and Humanitarian Aid Operations (ECHO).

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Contents

Executive summary

Over the past few years, countries in West Africa including Mali, Niger, Nigeria, and Burkina Faso, have seen a significant deterioration of their security situation. The security crises have led to forced population displacements. These population displacements, coupled with an increasing number of violent events, have led to the abandonment of many cultivated lands.

To better understand the impact on food security and livelihoods in hard-to-reach areas, World Food Programme (WFP), Regional Bureau for Western Africa, has developed a methodology that relies on high-resolution satellite imagery to assess cropland change dynamics. The methodology, which was initially developed in Mali, was applied in collaboration with national partners in Mali, Niger, Nigeria, and Burkina Faso in the past couple of years.

This report aims to highlight the good practices and lessons learned from the cropland change analysis in Mali. To guide future analysis in other countries, this report documents the implementation process, operational usages in the humanitarian field, and learnings from the country experience. Information and insights were collected in March 2023 from the analysis technical reports and interviews with WFP and participating partners such as National Direction of Agriculture, FAO, Geographic Institute of Mali, National Early Warning Systems agency, and others.

Additionally, this case study forms part of a learning initiative for WFP regional office to improve the analysis and evaluate the feasibility of the continuation of providing this support to country offices.

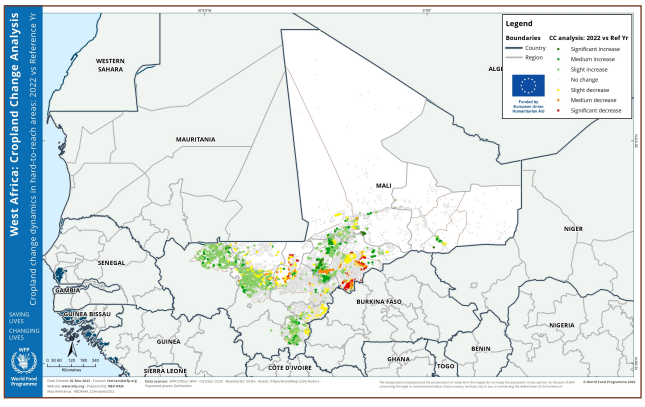
The methodology of the cropland change detection analysis was initially developed by WFP Mali Country Office to understand the cropland changes in 30 villages in the municipality of Mondora in Mopti region, that was under a blockage by armed groups. Since then, the methodology was further improved to optimize the analysis and to cover other regions in Mali.

In 2022, WFP together with CONACILSS trained national partners on the cropland change detection analysis approach. This was followed by a 2-weeks workshop to analyse the cropland change dynamics in hard-to-reach areas. WFP guided partners to analyse the areas and document the analysis results and data interpretation.

As the analysis covers hard-to-reach areas, the results are used in humanitarian response including informing Cadre Harmonisé, targeting and prioritization; national planning such as informing national agriculture campaigns, complement national agricultural data and answer questions received from government and other organisations on hard-to-reach areas; and coordination and collaboration of fieldwork and response activities. It is also used as an evidence tool to estimate population affected.

Additionally, a critical component of this analysis is building national capacities and inclusion to eventually phase out WFP's involvement.

The practice explored through the case study of Mali, shows that the success of attaining WFP's goal of strengthening national capacities and resilience depends on national and local government leadership, and multi-agency involvement. The high-level good practices and lessons learned illustrate the need for collaboration with national partners to achieve and sustain desirable outcomes.



Change detection analysis of 2022 in comparison to reference year

HIGH-LEVEL GOOD PRACTICES

- CONACILSS informed the process and led the coordination for participants.
- The analysis methodology is an efficient utilization of emergency funding and resources.
- The use of satellite images is an effective and innovative way to acquire data in hard-to-reach areas.
- Strong partnership between WFP and national organisations has been established.
- Segou was a convenient and central venue for all participants to attend.
- The analysis is relevant to humanitarian action.
- The methodology has been continuously getting improved.
- National capacities were strengthened through the training provided and guiding the analysis process.
- There is relatively wide awareness of the analysis to the food security related agencies.

HIGH-LEVEL LESSONS LEARNED

- The aim of WFP in "changing lives" can be further emphasized by scaling up resilience.
- Further strengthening of national capacities is needed by providing a detailed training manual and preparing national partners to take more lead.
- Integrate the analysis results with other data such as the rain measurements or Internally Displaced Population figures, if available, can be explored.
- Existing cropland change detection analysis methodology can be further improved and strengthened.

Learning from the analysis of 2022, the government of Mali, CONACILSS and WFP implemented a successful practice in terms of partnership and national ownership of the analysis results. The continuous improvement of the methodology and strengthening national capacities are seen as the critical role of WFP in future, with the main aim of gradually phasing out WFP's involvement.

Analysis workshop, October 2022

Introduction

Over the past few years, some countries in West Africa experienced security crises due to conflicts between armed groups and inter- and intra-community tensions. This instability of conflict and insecurity negatively impacted food security and livelihoods, as well as limited access to affected areas. It also led to forced population displacement, causalities, changes to the area cultivated or complete abandonment of cultivated lands and significant losses in food production. In rare cases, the armed groups and communities might cohabitate with no impact on croplands. Moreover, insecurity affected the functioning of national food security and agricultural monitoring systems.

The WFP Regional Bureau for Western Africa embarked on utilizing satellite imagery to better understand the impact on food security and livelihoods in hard-to-reach areas and assess cropland change dynamics. Using high-resolution satellite images, the cropland change in comparison to previous years was evaluated. The cropland change detection analysis was implemented in Mali, Nigeria, Niger, and Burkina Faso.

This report documents the lessons learned and the implementation of the cropland change detection analysis in Mali, to learn from the experience and form part of a learning initiative for countries in crises to:

- strengthen the analysis in hard-to-reach areas to better support emergency response and targeting;
- maintain a good practice in supporting partners related to food security; and
- continue to build national capacities and phasing out WFP.

This report explores good practices, successes, challenges, and lessons learned, with the aim of supporting more countries to effectively implement the analysis while managing food security issues. It can be used for technical guidance and advocacy for other countries having difficulties in collecting data in hard-to-reach areas.

CASE STUDY METHODOLOGY

Exploring and learning from the experiences of Mali is critical for informing and guiding other countries. This learning initiative will emphasize a collection of lessons to inform planning for this year's analysis, scale up effective implementation method, and facilitate the sharing of experiences between West Africa countries.

The methodology for this report included in-depth understanding of the actual analysis methodology, interviews with partners and key actors in last year's analysis in Mali and focus discussions with WFP Mali country office.

RATIONALE AND VALUE OF THE ANALYSIS

The main goal of the Cropland Change detection analysis is to support early warning systems and emergency response planning in hard-to-reach areas; as well as inform food security analysis and targeting of WFP field operations and humanitarian partners in West Africa.

The hard-to-reach areas are areas that are under blockage by armed groups or affected by conflict, and where field data collection is more challenging due to access constraints.

The analysis methodology uses Google Earth Engine, which is an open SaaS-like platform that hosts current and historical satellite imageries. This means that it is freely available without costs of satellite images and without the need to install client desktops nor processing satellite images. Therefore, the costs of this analysis are limited to the analysis and data interpretation time. In comparison to traditional field data collection costs and the security issues that staff may encounter in hard-to-reach areas, the analysis is considered an efficient, reliable, and good value-for-money alternative.

Learnings from Mali experience

Analysis methodology

Satellite images were acquired for the main agricultural season (i.e. between 15th June and 15th October) for the current year, the previous year, and a reference year before the start of the conflict in the analysed areas. The cropland changes in the conflict zones are detected by measuring the degree of change between the current year and a reference year, as well as between the current year and the previous year.

As a result of comparing the current year with a reference year or previous year, localities or villages get classified into 7 classes (ranging from significant cropland increase to significant cropland decrease) in a final map. Population affected by each class gets estimated accordingly.

According to interviewees, this analysis methodology is fit-for-purpose; however, it can be strengthened by adding the following related capabilities to further understand cropland change.

- Estimate cropland areas.
- Distinguish crop types.
- Capture the "gravity irrigated" cropland in floodplains e.g. rice in the Niger River basin.
- Add a validation method with consideration to security and difficulty to access some areas.
- Distinguish cropland change due to drought from change due to conflict.
- Seek reliable security data to understand the interrelationship between security and cropland change.
- Overlay the analysis results with Internally Displaced Population (IDPs) data for a better understanding of affected population. However, IDPs figures are dynamic and thus a point in time can only be represented.

Additionally, interviewees requested developing a friendly user interface and automating the analysis workflow; and suggested inviting other national organisations to participate in the training and analysis.

Implementation process

The process of Cropland Change detection analysis in Mali comprises of 5 main stages.

Stage 1: Communication

In collaboration with CONACILSS, the dates of the training and analysis workshop get confirmed, as well as agreement on the partners and their roles. Following this, CONACILLS sends invitation letter to national and international partners to attend the training.

Stage 2: Training

The training is conducted over 5 days between July-September each year, prior to the end of the agricultural season. During the training, the hard-to-reach areas get identified based on the security situation and difficulty to access those areas. Trainees get hands-on exercises and activities on using remote sensing in change detection and get familiarised with the analysis methodology. The training venue is chosen in a location that is easy to access by all partners involved. In 2022 analysis, Segou region was chosen as a central location for regional national staff to attend.

Stage 3: Analysis workshop

The analysis is conducted in October, at the end of the agricultural season and when the satellite imageries are available. During the 2 weeks workshop, the methodology and analysis script get applied on the hard-to-reach areas identified. In case of data discrepancies, validation (where possible) is used, as well as personal experience of the area in question. In 2022 analysis, 6 working groups were formed. Each group analysed a region, interpreted the data,

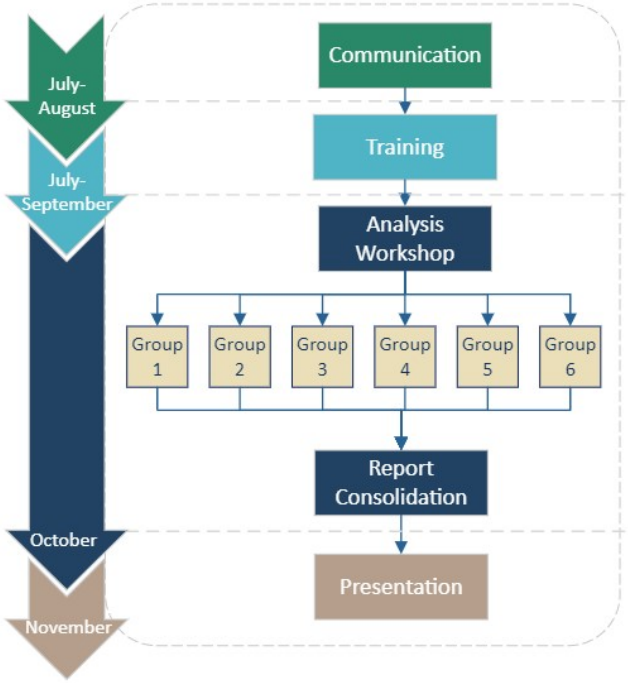
performed results validation (where possible), and documented the analysis results and interpretation. This took place in Bamako.

Stage 4: Report consolidation

In this stage, CONACILSS, National Directorate of Agriculture and WFP consolidated the documents into one technical report. The draft report gets sent to each region and working group for review. This would take 3-5 days.

Stage 5: Presentation

After the report gets reviewed and finalised, the analysis results get presented in a restitution workshop with all partners.



Implementation process in 2022

Due to the time restrictions between the time of obtaining the satellite imagery at the end of the agricultural season and the dates of Cadre Harmonisé, field validation of the analysis results (i.e. ground truthing) was restricted by the limited time and by the fact that the analysis is conducted on hard-to reach areas. However, efforts were made by the national technical group in Mali to conduct checks with key regional informants/ workers in the affected areas who had the capacity to verify and validate the results.

Introducing a validation method would be beneficial for the following 3 reasons.

1. Validate the analysis methodology or help in tuning it if required.
2. Help invalidating the "gravity irrigated" cropland in floodplains (e.g. rice in the Niger River basin).
3. Build trust in the analysis results, and thus the estimated figures of population affected.

Main actors

The main actors in the cropland change detection analysis In Mali were as follows.

- **The national committee of CILSS** (CONACILSS): responsible for coordinating the activities in consultation with WFP, sending invitations to national and international partners, advise on the venue of the workshops and dates, and participate in the analysis working groups.
- **WFP**: responsible for developing the methodology and training material, deliver a one-week hands-on training, supervise and guide the analysis working groups, participate in consolidating the analysis results, and participate in the final presentation of the results.
- **National partners**: attend the training and participate in the analysis working groups. This includes mayors and regional staff, Ministry of Agriculture and Rural Development, academic institutions, and international agencies.
- European Commission's Directorate-General for European Civil Protection and Humanitarian Aid Operations (**ECHO)**: the funding entity.

Operational utilisation

The cropland change detection analysis has been widely used by national and international organisations to support humanitarian response for the past 3 years.

> *"When insecurity issues started in Mopti region, cropland change detection analysis was the only way to get an idea of agricultural production in those areas. That is why it was quickly adapted by the Ministry of Agriculture and national partners as an information tool for evaluating the agricultural season in hard -to-reach areas."*
>
> Samba Barry, National Direction of Agriculture

Below are the current usages of the cropland change detection initiative that were identified by the national and international partners.

HUMANITARIAN RESPONSE

- Inform Cadre Harmonisé (contributing factors of Availability, and Hazards and Vulnerability).
- Inform WFP targeting for emergency response and prioritization.
- Used as an evidence tool to explain the targeting figures and confirms the findings of other tools such as Cadre Harmonise.
- Understand remotely the situation of cropland and population vulnerabilities, where security hinders field data collection.
- Used as an advocacy tool with donors to present the most credible source of food security related data to represent the situation.
- Support regional activities, such as monitoring food security situation, and prioritizing funding and response.
- Collect data remotely in fast and cheap manners than traditional time-consuming data collection.
- Understand the situation and estimate the population affected.

PREPAREDNESS AND RESILIENCE

- Monitor hard-to-reach areas, comparing it to other years and analyse the possible interrelationships such as security, population movement and climate change.

NATIONAL PLANNING AND RESPONSE

- Inform national agriculture campaigns i.e. the National Direction of Agriculture's campaign.
- Answer questions received from government, national or international organisations on hard-to-reach areas that are difficult to access due to security.
- Inform decision-makers and planning process where access is limited.
- Complement the national agricultural data on hard-to-reach areas.
- Alert disaster-related agencies and government to help in monitoring vulnerable population and reporting on agriculture.
- Plan food security related activities.
- Prioritize and monitor interventions at both regional and local administrative (localities, districts, province) levels.
- Understand the magnitude of impacts on food security in hard-to-reach areas.

CAPACITY BUILDING

- Strengthen national institutional capacities to phase out WFP through the provision of (1) comprehensive training to all regions and national institutions involved; and (2) guiding the analysis that is conducted by national partners in collaboration with WFP.

COORDINATION AND COLLABORATION

- Share and present the analysis results with partners and food clusters for a coordinated response and planning.
- Guide partners on how and where to best implement activities.
- Inform the coordination of fieldwork and response activities.

Analysis outcomes

The analysis concluded with percentage of cropland affected at the village or locality level. Data can be aggregated at the district or regional level. These results were mapped to visualise the cropland change. Based on this, the affected population was estimated in the severely affected regions of Mopti and Segou.

The analysis results informed the Cadre Harmonisé (CH) for November 2022, specifically for the" Availability" and "Hazards and Vulnerability" contributing components. The following are the direct output of the analysis.

1. Extensive **technical report** elaborating on the background and rationale for the analysis, selection of the areas analysed, data interpretation and security situation or any factors that might have affected the change in cropland, and recommendations for the use of the analysis results in emergency and targeting.
2. **Maps** showing the cropland change in classified into 7 classes: Severe, Medium or Slight decrease, Severe, Medium or Slight increase, and no change areas.
3. **Table** showing the above 7 classes and their percentage per each locality, district and region.
4. **Assessment table** for Cadre Harmonisé (CH) showing impact assessments (analysis of the contributing factors) i.e. impacts of long-term positive and negative changes on the Availability dimension and impacts of short-term negative changes on the Hazards & Vulnerability dimension.
5. **Summary note** on the analysis results intended for state structures and humanitarian actors. The summary note for 2022 analysis can be found here: https://docs.wfp.org/api/documents/WFP-0000147560/download/.
6. **Detailed list** of villages/communes assessments intended for informing humanitarian response mechanisms and strategic decision-making.

Technical report of Cropland Change detection analysis in Mali, 2022

Good Practices and lessons Learned

Good Practices

CONACILSS informed the process.

The coordination mechanism put in place between the WFP and CONACILSS supported the success of the analysis and active participation of national organisations in the analysis. In 2022, the analysis was fully conducted by national organisations with the support of WFP.

Value of emergency resources.

The results of the analysis being at the local level, allowed better targeting and decision-making support in the humanitarian response and resilience programs. The use of open (i.e. freely available) cloud tool and satellite imageries cut the costs of software, hardware, satellite imageries and imageries processing time. The only costs involved are the costs of training, and analysis and data interpretation. In comparison to traditional field data collection, there is a value of continuing to conduct this analysis, especially that it covers hard-to-reach areas.

Innovation in emergency response.

The use of satellite images is an effective and innovative way to acquire data in areas with limited access. It makes it possible to overcome the lack of quality, credible and reliable information in hard-to-reach areas due to conflicts or disasters. Although there are existing tools that can also provide estimation of population affected; yet there is limited understanding of the hard-to-reach areas due to security issues. Hence, using satellite imageries is crucial in obtaining data on these areas without jeopardizing the safety of staff.

Strong partnership between WFP and national organisations.

National organisations and WFP staff are adapted at working together in delivering services. National partners were in a better position to analyse and interpret the data in terms of situation on-ground. In Mali, almost all key national and international stakeholders were involved in the analysis. WFP's role was limited to providing the training and guidance during the analysis and reporting. Although WFP was guiding the analysis, the analysis was done by focal points from national government agencies and regions. This ensured national ownership of the analysis process and results, and that the national knowledge was included in the data interpretation. Interviewees reported motivation to support this cropland change detection analysis; and a wide participation in the training and analyses. Additionally, the role of WFP in training and guiding partners fulfil WFP's vision of "changing lives" and building national capacities to gradually phase out WFP from this analysis.

Relevance to humanitarian action.

The analysis results were used to inform decision-making process such as informing Cadre Harmonisé and targeting of population. The analysis results that also include the estimation of population affected, directly feed into early warning systems, food security activities, and agricultural response activities. It is highly relevant to humanitarian action in hard-to-reach areas in Mali.

Convenient venue.

The training was conducted in Segou region, a central region in Mali, to facilitate the attendance of partners from all regions.

Continuous improvement of the methodology.

The analysis started in Mali in 2020. Since then and the analysis methodology has been further enhanced and partners are interested in not only the continuous improvement of the methodology but to expand the use of remote sensing in other related areas such as differentiating between crop types, design of irrigation systems, and livestock grazing analysis.

Build national capacities.

A critical stage of the cropland change detection analysis is the 5-days training. This is appreciated by the national participants; and supports the country's transition to managing the analysis with fewer WFP involvement.

Awareness of the analysis.

The cropland change detection analysis has become relatively known to partners working in food security related fields. The interest has been raised over the past 3 years when this initiative started in Mali in year 2020. In addition to national organisations, food cluster shares the analysis results with other partners and non-governmental organisations (NGOs).

Lessons Learned

Emphasize the aim of WFP in "changing lives".

The initiative can support phasing out WFP through building resilience. To date, the analysis focused on understanding the cropland change and estimating the population affected. With the availability of the analysis for previous years, exploring the resilience of communities that experienced cropland decrease would be advantageous to inform building resilience activities i.e. identify and prioritise the areas that experienced significant cropland decreases for potential resilience activities. Scaling up resilience to tackle the underlaying food security issues would divert activities to "changing lives.

Further strengthening national capacities.

Interviewees reported the need to strengthen the training and facilitate the analysis and imagery interpretation. This can be improved by providing a detailed training manual and develop a user interface. The annual training's duration is seen as adequate; however, it was stressful to complete the analysis in the couple of weeks prior to the Cadre Harmonisé. Although, this time-constraints cannot be changed, But the analysis process might be expediated by including more participants and improving the methodology. Interviewees requested that the training is conducted closer to the analysis date.

Integrate the analysis results with other data.

The analysis results can be easily overlaid with other data, if available, such as the rain measurements or Internally Displaced Population figures, to further support decision-making in identifying areas affected by droughts and targeting of vulnerable population.

Strengthen the existing cropland change detection analysis methodology.

According to the interviewees, the analysis results are appreciated by all partners, and is used in the decision-making and planning processes. There is a room for strengthening it to enhance population affected estimation and provide a methodology to estimate the measurements of cropland areas affected. Before the next annual training, the methodology should be enhanced.

Challenges

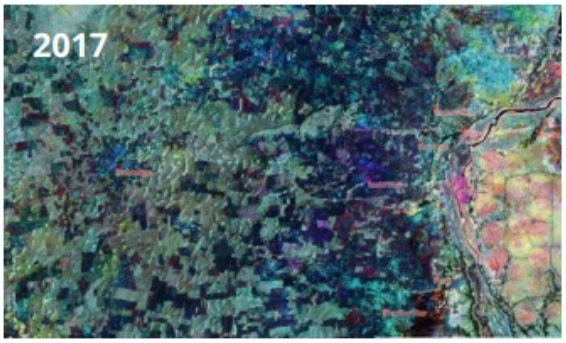
- The analysis uses open platform and high-resolution (HR) satellite imageries to deliver this analysis. Interviewees reported the need for Very High Resolution (VHR) imageries to facilitate data interpretation and expediate and improve the analysis results. However, VHR satellite imagery could not be used instead of the current HR imagery for several reasons including imagery availability, timing and coverage of images, data processing, and justification of costs involved to purchase it only to cross-check the analysis results for a sample of villages.
- The methodology is less tailored to capture "gravity irrigated" croplands in floodplains e.g. rice in the Niger River basin. Thus some types of crops are not easily detected.

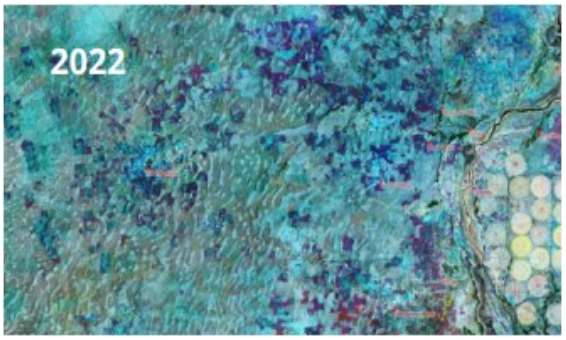
Conclusion

Through this case study, national and international participating partners had provided insights and lessons learnt from the implementation of the cropland change detection analysis in Mali. The lessons shared were ranging from implementation process to technical methodology areas. Recommendations were gathered from participating partners not only on potential improvements, but also on strengthening the utilization of the analysis results in supporting food security various activities.

The analysis results are used in the humanitarian response, planning, and targeting, by both the national and international organisations. It helped in prioritizing emergency funds and response through an evidence-based analysis results. Additionally, it provided insight into the vulnerabilities in hard-to-reach areas.

Learning from the analysis of 2022, the government of Mali, CONACILSS and WFP implemented a successful practice that fulfilled its goal of national participation and inclusion. Furthermore, national organisations, especially at the Ministry of Rural Development and Agriculture, fostered the analysis results as a mean to complement their understanding of the situation in the hard-to-reach areas. The continuous improvement of the methodology and strengthening national capacities are seen as the critical role of WFP in future.





Appendices

Appendix 1: Summary notes of 2022 analysis

Mali

Mali has experienced a security crisis due to conflicts between armed groups and inter- and intra-community tensions in the northern parts of the country since 2012. Instability has spread to the central regions of the country since 2018 and gradually worsened, with conflict and insecurity impacting food security and livelihoods, as well as limiting access to affected areas.

https://docs.wfp.org/api/documents/WFP-0000147560/download/

Nigeria

Over the past few years, northern Nigeria has been the scene of increasing violence; with the north-eastern state of Borno and north-western states of Zamfara, Katsina and Sokoto being among the worst affected. Conflict and insecurity have led to forced population displacement and casualties; causing significant losses in cropland use and food production. In 2022, 44 hard-to-reach areas in 4 states in northwest and northeast of Nigeria were analysed.

https://docs.wfp.org/api/documents/WFP-0000147544/download/

Burkina Faso

Over the past few years, Burkina Faso has seen a significant deterioration of its security situation, particularly in the northern and eastern parts of the country including the Sahel, Nord, Centre-Nord, Centre Est, Est and Boucle du Mouhoun regions. In 2022, the analysis covered 25 provinces of Burkina Faso, or approximately 12 thousand villages in 6 regions

https://docs.wfp.org/api/documents/WFP-0000147717/download/

Niger

Insecurity in Niger is hampering the monitoring of national food security. The cropland change detection analysis covered 6484 localities in 5 regions. The number of people living in those localities is estimated at over 4.7 million as of November 2022, in addition to the displaced population caused by the security situation.

https://docs.wfp.org/api/documents/WFP-0000148609/download/

Appendix 2: Interview Questions

- Do you think we are achieving the objective of the cropland change detection analysis?
- What could WFP have done better?
- What success looks like and what do we do right to make this analysis successful?
- What was the workflow of the cropland change analysis from initiation to presenting results to partners?
- Who were the key players in the success of the analysis? Who could be the other partners in future?
- How was raising awareness of the analysis carried out in the past?
- How was the analysis further used by partners? Specifically, beyond its use in the CH, what other uses were made of the analysis results?
- What are the lessons learned from 2022 analysis?
- what worked well and what could have been better?
- What are the general recommendations for future analysis?
- What were the key issues encountered that could hinder the sustainability of this analysis?
- Do you have all the resources needed to complete this analysis?
- What was the role and responsibility of the different actors?
- What is the ideal timing to conduct the training and analysis?
- What are the different activities involved in the cropland change detection analysis?

Appendix 3: List of persons interviewed

NAME	AGENCY
Abdou Ballo	University of social science of Bamako
Abdou keita	Food and Agriculture Organization (FAO)
Abdoulla Houdou	Early Warning Systems (SAP)
Abouba Yatara	National Direction of Rural Engineering (DNGR)
Allo Dimanche	World Food Programme (WFP)
Aicha Konte	Food and Agriculture Organization (FAO)
Amadou Ibrahim	World Food Programme (WFP)
Amadou Kone	National Direction of Agriculture (DNA)
Amadou Moustapha	World Food Programme (WFP)
Armond Ndimurkundo	World Food Programme (WFP)
Bakary Sissouma	World Food Programme (WFP)
Bashir Oumarou Moumouni	World Food Programme (WFP)
Boubacar Dembele	Food and Agriculture Organization (FAO)
Dansine Diarra	University of social science of Bamako
Djibril Diallo	World Food Programme (WFP)
Fatimata Hacko	World Food Programme (WFP)
Goita Moussa	Early Warning Systems (SAP)
Hamdy Koussouba	National Direction of Animal Production and Industries
Ibrahima Sabouba	National Direction of Rural Engineering (DNGR)
Ichiaka Bangaly	Early Warning Systems (SAP)
Issadiokele Diarra	World Food Programme (WFP)
Issa Tourie	Meteorology
Judith Ular	World Food Programme (WFP)
Mahamadou Zmaiga	National Direction of Agriculture (DNA)
Mohamane Badamassi Ousmane	World Food Programme (WFP)
Mohamedlamine Baby	World Food Programme (WFP)
Mohamed Sylla	Food and Agriculture Organization (FAO)
Ousmane Diabre	World Food Programme (WFP)
Papylievain Bahavu	World Food Programme (WFP)
Samba Barry	National Direction of Agriculture (DNA)
Seriba Kone	Food and Agriculture Organization (FAO)
Seydou Konare	National Institute of Statistics
Souleymane Yacouba	National Direction of Agriculture (DNA)
Yacouba Kone	CONACILSS

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