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TECHNICAL ASSISTANCE TO SUPPORT THE NATIONAL AGRICULTURE CENSUS 2019

June 2022

SDGs:



Country: Fiji

Project Code: TCP/FIJ/3703

FAO Contribution: USD 359 000

Duration: 15 February 2019 – 31 December 2021

Contact Info: FAO Subregional Office for the Pacific Islands
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Implementing Partner

Ministry of Agriculture (MoA).

Beneficiaries

Staff from the Fiji Bureau of Statistics, Ministry of Fisheries, Ministry of Forestry, Ministry of Sugar Industry; Farmers in rural and peri-urban sectors.

Country Programming Framework (CPF) Outputs

Fiji CPF 2018-2022 Output 2: Sustainable and climate-smart practices promoted to help build resilient agriculture, fisheries and forestry production systems.

Pacific CPF 2018-2022.

Fiji National Development plan.

Fiji 2020 Agriculture Sector Policy Agenda.

Pacific Strategic Plan for Agricultural and Fisheries Statistics (P-SPAFS): Strengthening the evidence base for achievement of the Sustainable Development Goals.

Interregional Initiative (IRI) on SIDS [Small Island Developing States] - Pacific Component: Strengthened evidence-based information to support multi-sectoral policy action.



BACKGROUND

Fiji is a small island state, which is vulnerable to the effect of climate change, natural disasters and consequently, economic shocks. As Fiji’s large rural population is highly dependent on agriculture for their livelihoods, it is crucial that the government has detailed information on the composition and structure of the agriculture sector to assist with planning and responding to these events. Prior, little and irregular information is collected or disseminated to agriculture sector stakeholders, limiting the capacity to develop evidence-based policies and strategies. Low resource availability for follow-up agriculture surveys, in addition to staff changes, has meant a loss of knowledge of the census methodology and databases, and data for monitoring progress in the agriculture sector and against the SDGs is also lacking or not always reliable. As such, the government has committed to an ambitious programme of agricultural development under the Fiji 2020 Agriculture Sector Policy Agenda.

The development of up-to-date and inclusive agriculture information is a key priority on the agenda and a Strategic Plan for Agricultural and Rural Statistics (SPARS) for Fiji was developed, with an agriculture census as a key component.

With these challenges in mind, new priorities were outlined in the recent agriculture programme, aiming at providing a benchmark for planning and policy decisions for the sustainable development of the agriculture sector. The Government of Fiji thus requested FAO technical assistance to support the strategic planning and implementing of Fiji’s Agriculture Census (FAC) in 2019. The data produced will support evidence-based policy-making and contribute towards poverty reduction and achieving food security goals through effective agricultural and rural development policies and programmes. The government is aiming at full coverage of the agriculture sector, the inclusion of more information on the environment and a greater focus on the role of women in agriculture. With new developments in technology since the previous censuses, especially in the use of Computer Assisted Personal Interviewing (CAPI) and dissemination systems, FAO’s technical support focused on addressing the aforementioned priorities and to improve the methodology, dissemination and ability to use the information collected.

IMPACT

The project reinforced Fiji’s Agriculture and Rural Statistics System capacity to generate quality agricultural data. The results of the agriculture census are being used to monitor national sector strategies and assist in evidence based policy making on agriculture and food security (SDGs 1 and 2). The census results also contribute to the compilation of farm survey based SDG indicators, thereby improving the overall national capacity to produce and analyse agricultural statistics.

ACHIEVEMENT OF RESULTS

The project succeeded in implementing the planned activities and has successfully influenced the growth and development of the statistics team within the MoA. The staff of the Agricultural Statistics Unit of MoA, as well as their colleagues from the ministries of fishery and forestry, were trained both in-person and online due to the COVID-19 pandemic. To enhance staff capacity, a new methodology and data collection tools were developed, piloted in the field and eventually finalized. The CAPI methodology was utilized for the data collection of FAC 2020, which was the first census to follow a complete enumeration approach, marking a significant milestone in census data collection for agricultural statistics in the country.

The FAC 2020 covered all rural and part of peri-urban areas in the country, including all farming households and institutions in the assigned areas. Additionally, institutions, such as schools, group-owned farming organizations and large commercial farms that were not owned by households, were taken into account. Based on the outcomes of the FAC 2020, SPARS, drafted under the Global Strategy to improve Agricultural and Rural Statistics, was reviewed and updated, providing a strategy for the development of the national agricultural and rural statistics system for the period 2022-28 and envisaging an improved administrative reporting system with a programme of agricultural censuses and surveys implemented to supplement administrative data. Some surveys will be ongoing, such as market and roadside price collections. Others will be undertaken on a five or ten year basis.

As part of SPARS is the aim to improve the reporting and dissemination of key results, the First Annual Agriculture Statistics Dissemination Conference was co-organised by FAO and MoA from 6 to 10 December 2021 to provide a platform of information and knowledge sharing with data providers and users in order to build an understanding on the scope of data needs, data implications and requirements of the agricultural statistical system. Moreover, the ministry recently launched the Online Data Library Hub for Fiji Agriculture Statistics, which can be accessed on the MoA's website. The online data library records the latest agriculture statistics on production, trade, district profiles, farmers demographic, market information and monthly farm level data. Apart from the online library, quarterly reports and monthly market situation briefs have been circulated to stakeholders for updates and references.

IMPLEMENTATION OF WORK PLAN AND BUDGET

Minor delays were encountered in the implementation of the project. Initial activities to prepare the census methodology, tools and enumeration were implemented in a timely manner, while delays with data processing and subsequent activities occurred due to COVID-19 restrictions. However, the project team mobilized available resources and offered different modes of delivering the assistance and training, which resulted in the successful completion of planned activities. A no-cost extension was approved because the data processing, particularly the data cleaning and clarification of some missing information, took longer than initially planned. These delays can be explained due to other emerging priorities related to COVID-19 and cyclones, which affected Fiji during the project period.

FOLLOW-UP FOR GOVERNMENT ATTENTION

Further development may be needed to support MoA, which should be determined through SPARS in the establishment and operation of upcoming surveys, as well as the compilation of farm survey-based SDG indicators. Timely endorsement and following up of the implementation of SPARS, proper maintenance and regular updating of farmers listing/sample frame are very important for further development of agricultural statistics in Fiji.

SUSTAINABILITY

1. Capacity development

Partnerships and alliances were created and strengthened, which contribute to the project's sustainability. The MoA primarily shouldered the responsibility of conducting the FAC 2020 in collaboration with Ministry of Fisheries, Ministry of Forestry, Fiji Bureau of Statistics, Ministry of Economy, Ministry of Sugar Industry, Ministry of Rural and Maritime Development, Ministry of iTaukei Affairs, Ministry of Health and Medical Services and Ministry of Women, Children and Poverty Alleviation, with technical support provided by FAO. The World Food Programme's Regional Office for the Pacific assisted with the establishment of the Agriculture Data Hub. The results of the agriculture census informed the progress on Fiji's Agriculture Sector Policy Agenda and the development of the new sector plan, including on women and youth in agriculture, the updating of relevant SDG indicators and targets and assisted active stakeholders in formulating effective policy intervention programmes to assist farmers and fishers.

2. Gender equality

Special attention was given to women's participation in agriculture during the data collection and the respective analyses of this data. In addition, volume three is a gender analysis report. In each project activity and capacity building initiative, women and men equitably participated.



3. Environmental sustainability

Monitoring the environmental sustainability of agricultural practices is a key question and priority in questionnaire.

4. Technological sustainability

The design and implementation of the project were carried out in a participatory manner with the involvement of the aforementioned parties. As the first CAPI-based census operation within MoA, the FAC 2020 was to some extent a learning exercise and any operational issues will be better understood in the future. During the project implementation, satellite imagery was used for boundary description, which was followed by ground-truthing to verify the descriptions on the field. Tablets with global positioning system (GPS) were used during data collection. Video teleconferencing systems were also installed in all census regional centres for team briefings, communication, discussions and updates. Lastly, the census results were presented through an online dashboard system, including ArcGIS maps.

5. Economic sustainability

The government allocated significant financial resources for the census and subsequent survey programmes. All tools and materials delivered throughout the project were made readily available to beneficiaries and stakeholders and the hardware, procured under this project, can be reused for MoA's subsequent surveys. The agriculture statistics that resulted from this project are available both in hard and soft copies.



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DOCUMENTS AND OUTREACH PRODUCTS

- ❑ *Fiji Agriculture Census 2020 CAPI Questionnaires: for households and institutions.*
- ❑ *Fiji Agriculture Census 2020 Field / CAPI Supervisor Manual.* 18 pp.
- ❑ *Fiji Agriculture Census 2020 Enumeration Manual.* 115 pp.
- ❑ **L. Bruce.** *Fiji Agriculture Census 2020 - CAPI and Data Processing, Lessons Learnt.* 9 pp.
- ❑ *FAC Final Data Sets in SPSS - Raw household data, clean household data (with identifiers), clean household data (anonymized), institution data.*
- ❑ *Tabulation system: Final Tabulation System, Final Tables (pre-defined).*
- ❑ 2021. *2020 Fiji Agriculture Census Volume I: General Table and Descriptive Analysis Report.* Fiji. 351 pp.
- ❑ 2021. *2020 Fiji Agriculture Census Volume II: Detailed Analysis and report of enumeration areas.* Fiji. 666 pp.
- ❑ 2021. *2020 Fiji Agriculture Census Volume III: Gender Analysis Report.* 70 pp.
- ❑ 2021. *2020 Fiji Agriculture Census Volume IV: Administration Report.* 174 pp.
- ❑ 2021. *2020 Fiji Agriculture Census: Key findings, infographics.* 12 pp.
- ❑ 2020 Fiji Agriculture Census: Key findings, video. <https://www.youtube.com/watch?v=4ADlZis7Ng&t=6s>.
- ❑ 2020 Fiji Agriculture Census: publicity materials. https://www.youtube.com/watch?v=BNK_817CBhg.
- ❑ *SPSS Course - Video Lessons in 5 modules and supplementary materials, training report.*
- ❑ *FAC-edit specifications.*
- ❑ *FAC Tabulation plan.*
- ❑ *Recommendations on Post Enumeration Survey.*
- ❑ *Lessons Learnt: Deficiencies in the Questionnaire.*
- ❑ *Data analysis and report writing. PowerPoint Presentation.*
- ❑ *Data Anonymization. PowerPoint Presentation.*
- ❑ *Data Archiving. PowerPoint Presentation.*
- ❑ *Metadata. PowerPoint Presentation.*
- ❑ *Website features; website navigation tree.*
- ❑ *Sampling Theory. PowerPoint Presentation.*
- ❑ *Stratified Random Sampling. PowerPoint Presentation.*
- ❑ *Systematic Sampling. PowerPoint Presentation.*
- ❑ *Market Survey Questionnaire in Kobo Toolbox.* <https://ee.humanitarianresponse.info/x/Wyp5ymTu>.



ACHIEVEMENT OF RESULTS - LOGICAL FRAMEWORK

Expected Impact	Strengthened agricultural policy-making and strategic planning leading to improved food security and livelihoods		
Outcome	Improved national capacity to produce and analyse agriculture statistics		
	Indicator	Capacity to produce agricultural information enhanced.	
	Baseline	Current staff has limited experience and capacity in census data collection and analysis.	
	End Target	Agricultural statistics unit in MoA trained on agriculture data processing and analysis by Q1 2021.	
	Comments and follow-up action to be taken	<p>The staff of the Agricultural Statistics Unit in MoA, as well as their colleagues from ministries of fishery and forestry, were trained through formal and on the job training on all aspects of the agriculture census planning, implementation and analysis, in accordance with the World Programme for the Census of Agriculture (WCA) 2020.</p> <p>The FAC 2020 was the first census following a complete enumeration approach, marking a significant milestone in census data collection for agricultural statistics in the country. The previous four agricultural censuses in Fiji were conducted on sampling basis, which limited generation of estimates of various characteristics at lower geographies. This census also used the CAPI method for data collection.</p>	
Output 1	Capacities and methodology for 2019 Agriculture Census are developed		
	Indicators	Target	Achieved
	Agriculture Census methodology developed, pre-piloted and finalized	Methodology completed with pre-piloted CAPI questionnaire and processing systems, and available to Census Steering Committee for approval by Q4 2019	Yes
Baseline	Outdated methodology and data collection tools for Agriculture Census		
Comments	<p>The census methodology, products, services, dissemination methods and tools for disseminating the FAC 2020 results and key findings were determined through technical working group committee meetings and consultations with stakeholders, as well as the Data User Conference.</p> <p>The CAPI-based data collection methodology was developed, pilot tested in the field and successfully utilized in the data collection for Fiji Census of Agriculture 2020. The census covered 21 items out of the 23 essential items recommended in the WCA 2020. The scope covered agricultural activities (crops and livestock production), aquaculture, fisheries, and forestry activities. The census also covered all rural and part of peri-urban areas in the country. All farming households and institutions in assigned areas were covered, and the institutions considered were schools, group-owned farming organizations and large commercial farms that were not owned by households.</p>		
Activity 1.1	Develop census methodology and plan		
	Achieved	Yes	
Activity 1.2	Comments	<p>The content, concepts and definitions for the Fiji Agriculture Census 2020 were finalized as per the census workplan. Questionnaires (household and institutions) were developed in close collaboration with other involved ministries/members of a technical working group. A CAPI-based census field system set up was ready well before the pilot census. Data processing and tabulation system were designed and a tabulation and data dissemination plan for aggregated indicators was prepared. Further, anonymized microdata in compliance with Open Data Standards were developed. Quality control procedures, including editing specifications, were prepared. An awareness and publicity plan was prepared.</p>	
	Comments	<p>A pilot census was carried out in selected locations throughout Fiji to test the questionnaires, data collection methods, the training programme for field staff, instruction manuals, data editing and coding procedures, data processing and tabulation. The first questionnaire pre-test was conducted in-house from 20 to 26 June 2019, before the first field pre-test, which was undertaken on 10 July 2019. The main purpose was to test the flow and structure of questions in the questionnaire. The second pre-test was conducted in the Sigatoka area, along the sugarcane belt-areas in Ba. The duration of interview per questionnaire and the enumerators' depth of understanding of the 2020 FAC questionnaire were also tested. The results of the pilot census were utilized to make further improvements in the census instruments, including the data processing system. A complete set of tables was produced, using data from the pilot to evaluate the quality of data and the tabulation software.</p>	

Output 2	A sound database on the structure of Fiji's agriculture and an updated list frame for future Agriculture Census and Surveys is available		
	Indicators	Target	Achieved
	2019 Census database produced, and updated list frame available.	2019 Census database available. List frame enhanced and updated to 2019.	Yes
Baseline	2009 Census data available. List frame mostly based on 2015/16 baseline survey.		
Comments	<p>The FAC 2020 used several sources for the frame: the farming household baseline survey 2015/2016, a review of farmers listing 2018, the Population and Housing Census (PHC) 2017 locality data, boundary descriptions using satellite imagery and ground-truthing of field descriptions. The first list of farms, established by the MoA, was undertaken in 2015/2016, and improved in 2018 since the coverage in 2015/2016 was incomplete due to Tropical Cyclone Winston. Data from PHC 2017 was used to verify the coverage. The 2018 review of farmers listing was done at the village level in parallel with satellite imagery and ground-truthing of the field descriptions. In the end, a final frame for FAC 2020 was established with 70 161 households.</p> <p>An anonymized version of the database of FAC 2020 in SPSS format was produced, in which all the respondent's details, such as names, household numbers, and GPS coordinates, were removed. These identifying variables are stored in a separate database that can be re-identified by running an SPSS syntax. The FAC 2020 micro-data, final tables, and final reports are secured in the MoA main server, located in the MoA information technology room with limited access by the information technology officers.</p>		
Activity 2.1	Support data collection and processing		
	Achieved	Yes	
Comments	<p>The field work for the 2020 FAC was undertaken 1-29 February 2020. FAO consultants provided assistance throughout the processes, including the final testing and modification of the CAPI system. Furthermore, they provided assistance in preparing the tablets and the server to begin the fieldwork and in-person training sessions with CAPI supervisors and headquarters quality control staff. Technical support, following the fieldwork launch, including some small revisions to correct bugs and changes that were requested by MoA and that were required. New versions were deployed to the interviewer tablets in the initial days, following a troubleshooting tablet and system queries from interviewers in the field.</p> <p>A comprehensive array of data validation checks was incorporated into the CAPI data collection system to help enumerators identify possible errors or outliers in the data reported. This was done as the responses were recorded so that enumerators could correct the data on the spot. This greatly improved the data quality compared with previous censuses.</p> <p>In addition to ongoing case checks by FAC and headquarters staff, the database was downloaded from the server in SPSS format each day. An automated syntax was used to produce and distribute two key reports. The first was a daily monitoring report, showing survey progress on key metrics, such as farmers, agricultural activities, number of land parcels, land tenure and size, count of key crops and area planted, etc. The second report was produced for quality control, monitoring the number of rejected cases and errors per interviewer.</p> <p>A Post Enumeration Census (PEC) was undertaken during April 2020 to verify the quality of data collected. Farmers listing was considered as a baseline for PEC. The FAC 2020 coverage was verified at the locality level. Four teams conducted post-enumeration exercises at purposive selected of under-covered areas in the central, northern and western divisions. The areas were identified through comprehensive coverage analysis of FAC 2020 areas, 2018 reviewed farmers listing and a coverage map from Survey Solution. Districts and Localities with less than 70% coverage were selected and revisited during post enumeration.</p> <p>Data processing activities, such as data cleaning and clarification of some missing information, took much longer than initially planned. Delays were due to prioritization of other activities on agriculture, COVID-19 and cyclones that affected Fiji during this period.</p>		

	Assist with producing, validating and analysing census data	
	Achieved	Yes
Activity 2.2	Comments	<p>A system for data cleaning was set up, consisting of template folders and a pre-prepared SPSS syntax created to complete the data processing and cleaning of the data files ready for tabulation. The steps in this process are detailed below:</p> <ul style="list-style-type: none"> – Stack versions of databases together, concentrate the data files so that all cases are together in the SPSS format files. – Produce excel outputs of open end responses for back coding and cleaning work to be undertaken by senior MoA staff once data collection and quality control is complete. – SPSS syntax created to merge variables between these files, which are required for tabulation. – SPSS Syntax prepared for each chapter of the tables. <p>Following the completion of the fieldwork, data was cleaned and an initial set of tables were produced. From this point, there were significant re-works of the tabulations due to additional cleaning of values, imputation of values, re-designs of tables, as requested by MoA. By March 2021, the database and tabulations were considered to be final.</p> <p>Training on SPSS was provided to MoA initially in person during a mission in early 2020. This training included basics of SPSS, data formatting, cleaning and creation of tabulations. Due to COVID-19, a second mission was not possible so a video training course was produced and shared with MoA Fiji. The MoA staff successfully completed this training course in September 2021, including a live question and answer session with the consultant and course participants. The two weeks of SPSS training broadened the knowledge, increased the skills and improved the capability of participants in the area of data processing, tabulation and analysis through the use of SPSS. This will further assist the statistical unit in providing timely and quality agriculture statistics to users. Simultaneously, this was part of an ongoing preparation for the annual surveys and next agriculture census.</p> <p>Outlines for drafting the Agriculture Census Report were developed and shared with the MoA team to prepare the publication for the presentation of the final results. A training program was conducted remotely on 'Data Analysis and Report Writing' in the context of FAC 2020, which included following topics:</p> <ul style="list-style-type: none"> – data analysis; – report writing; – metadata; – anonymization; and – data archiving. <p>In the process of the generation and finalization of tables, the contents of the tables were scrutinised and commented on. The consistency and coherence of the tables, finalized by the census team, were examined and feedback was given back to the team.</p>
Activity 2.3	Assist with documentation and preparation of frame for future surveys	
	Achieved	Yes
	Comments	<p>As mentioned above under Output 2, an anonymized (de-identified) version of the database of FAC 2020 in SPSS format was produced. The database will be used as a frame for future surveys. Remote training on sampling methodology, which combined training materials and online question and answer sessions, was held.</p>
Activity 2.4	Updating plans for agriculture statistics	
	Achieved	Yes
	Comments	<p>The SPARS, drafted under the Global Strategy to improve Agricultural and Rural Statistics, was reviewed and updated based on outcomes of the FAC 2020. The SPARS provides a strategy for the development of the national agricultural and rural statistics system for the period from 2022 to 2028 and envisages an improved administrative reporting system with a programme of agricultural censuses and surveys, implemented to supplement the administrative data. Some surveys will be ongoing, such as market and roadside price collections; others will be undertaken on a five or ten year basis.</p>

Output 3	Agriculture census results are disseminated in user friendly formats		
	Indicators	Target	Achieved
	Results are disseminated in a report and on the website in the form of tables and maps.	The 2019 report and other dissemination products are accessible for all users.	Yes
Baseline	No census reports are available on national domains.		
Comments	The final results of the FAC 2020 were tabulated, analysed, printed and published in four volumes: (i) Descriptive Analysis Report; (ii) Detail Analysis and Report of 2020 FAC Enumeration Area; (iii) Gender Analysis Report; and (iv) Administrative Report. All volumes were printed, disseminated on Universal Serial Bus (USB) keys, uploaded on the MoA website and also presented to government agencies, non-governmental organizations, international partners, academics and farmer associations. An Online Agriculture Data Library Hub, as a part of MoA website, was launched in December 2021. The FAC 2020 key findings were also disseminated through video animation and infographics.		
Activity 3.1	Assist with reporting and dissemination		
	Achieved	Yes	
	Comments	Assistance was provided on data processing, tabulation, preparing the outline of the report, consistency and coherence checks and also the design and layout of infographics and video animation. The First Annual Agriculture Statistics Dissemination Conference was co-organised by FAO and MoA 6-10 December 2021 to provide a platform of information and knowledge sharing with data providers and users and to build understanding on the scope of data needs, data implications and requirement of the agricultural statistical system.	
Activity 3.2	Assist with the website for agriculture statistics		
	Achieved	Yes	
	Comments	A list of desirable website features in terms of content and design were drawn up for MoA to improve the development of the website and hosting agriculture statistics. The ministry recently launched the Online Data Library Hub for Fiji Agriculture Statistics, which can be accessed on the MoA website. The online data library records the latest agriculture statistics on production, trade, district profiles, farmers demographics, market information and monthly farm level data. Apart from the online library, quarterly reports and monthly market situation briefs are circulated to stakeholders for updates and references. All the reports are published on the ministry's website.	

Partnerships and Outreach

For more information, please contact: Reporting@fao.org

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