Food and Agriculture Organization
of the United Nations

ENHANCING FOOD SECURITY AND COMBATING CLIMATE CHANGE THROUGH SCALING UP SAGO PALM PRODUCTION

December 2024

SDGs:	
Country:	The Independent State of Papua New Guinea
Project Code:	TCP/PNG/3901
FAO Contribution:	USD 472 000
Duration:	23 March 2022–30 April 2024
Contact Info:	FAO Office in Papua New Guinea FAO-PG@fao.org

Implementing Partners

The Department of Agriculture and Livestock (DAL), Provincial Departments of Agriculture and Livestock (Manus Provincial Department of Agriculture and Livestock, Bougainville Department of Primary Industries and Marine Resources, East Sepik Provincial Department of Agriculture and Livestock), National Agriculture Research Institute, Fresh Produce Development Agency of Papua New Guinea.

Beneficiaries

Men, women, and youths from rural, sago-dependent communities.

Country Programming Framework (CPF) Outputs

SO2: Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner.
CPF Priority Area 1: Enhancing equitable, productive and sustainable natural resource management.


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BACKGROUND

The project focused on addressing the pressing challenges of food insecurity and climate resilience in Papua New Guinea, where more than 81 percent of the population lives in rural areas and relies on subsistence agriculture. The diversity of crops grown by these farmers is largely determined by their geographic location and local climate. Despite this agricultural diversity, Papua New Guinea faces significant food insecurity, with 57 percent of the population experiencing moderate to severe food insecurity, a situation exacerbated by climate change, natural disasters and economic challenges.
A key focus of this project is the development of the sago palm (Metroxylon sagu) as a viable commercial crop. A traditional staple food for nearly 30 percent of Papua New Guinea's population, particularly in lowland, atoll and wetland communities, sago has significant potential to improve food security. Despite being rich in carbohydrates, sago remains commercially underutilized, both within Papua New Guinea and internationally.

The project aims to harness this potential through two main approaches: the establishment of large-scale sago plantations managed by the public sector, and the promotion of smallholder sago farming as a community-based business model. This dual approach aimed to improve household food security, conserve wetland natural resources, and generate rural incomes.
The project has been implemented in three coastal provinces - Manus, East Sepik and the Autonomous Region of Bougainville - that are particularly vulnerable to the impacts of climate change. These regions are home to a significant portion of Papua New Guinea's sago palm resources, making them ideal locations for scaling up production.
DAL led the implementation of the project, working closely with FAO to ensure timely delivery of technical inputs and support. The project benefited directly to 3 000 people, enhancing their livelihoods and food security while contributing to broader climate resilience efforts in the region.
The project aimed to enhance food security and generate sustainable economic opportunities for Papua New Guinea's rural communities. By capitalizing on the untapped potential of sago palm, the project aimed to establish sustainable agricultural practices aligned with environmental conservation and economic development goals.

IMPACT

The impact of the project will be significant in enhancing food security, improving livelihoods, and building climate resilience in vulnerable rural communities. By focusing on the underutilized sago palm, the project will transform it into a commercially viable crop, providing sustainable economic opportunities for over 3 000 direct beneficiaries.

ACHIEVEMENT OF RESULTS

The project significantly contributed to several Sustainable Development Goals (SDGs), particularly those related to no poverty, zero hunger, responsible consumption and production, good health and well-being, by enhancing food security and promoting sustainable livelihoods. The successful outcome of increased sago production was achieved through large-scale cropping, comprehensive management practices, and value-addition techniques in the Sepik and Manus Islands, including an existing wild sago palm stand.
The project's outputs were realized by implementing an improved sago cultivation system across 31 hectares of coastal areas in two locations within the Sepik and Manus provinces.

In addition, the project introduced better post-harvest management practices and value addition methods in the targeted sago palm cropping zones, including 10 hectares of existing wild sago palm stand areas. The project also enhanced the capacities of farmers, technical staff in the Sepik and Manus Islands, and sago palm cultivation experts at both the government and community levels in sago palm cropping and management.

Implementation of work plan and budget

An agreement for a one-year collaboration was signed between the Tokai National Higher Education and Research System in Japan and FAO on 31 May 2022, with the project duration extending until 31 May 2023. The project involved conducting surveys and assessments of cropping and production systems in Sepik and Manus. It included demonstrations and training on community-based cropping, management, value addition practices, mechanized improved harvesting, post-harvest management, and downstream processing and value addition of sago starch. All activities were implemented within the allocated budget.

Moreover, the project faced limited to no risks. To ensure smooth operations, there was active engagement with relevant partners at the national, sub-national, and community levels. Equal participation of both men and women was ensured from the design and planning stages through to implementation at all levels of government and within the community. Close monitoring by FAO and provincial authorities was crucial in mitigating any potential risks.

The project was assessed to be low risk, both environmentally and socially, and its implementation proceeded smoothly with minimal risks.

Follow-up for government attention

The government's follow-up attention should focus on ensuring the sustainability of the project by integrating the successful practices and outcomes into national agricultural policies and development plans. This includes continued support for sago palm cultivation and processing, facilitating market access for sago products, and scaling up the project to other regions. The government should also monitor the long-term impact on food security, livelihoods, and climate resilience in the beneficiary communities, and provide ongoing resources and technical assistance as needed. Additionally, it is essential to maintain strong coordination with local institutions and stakeholders to ensure the continued success and expansion of the project. The National Agriculture Sector Plan 2024-2033 will be divided into two medium-term plans, and FAO has been asked by the relevant government agency (DAL) to support the process.

It is envisaged that the lessons learned will be incorporated into policy in 2025 and given relevance as sago palm is a staple crop for the coastal provinces of Papua New Guinea.

Sustainability

1. Capacity development

The Provincial Government of Manus has adopted new strategies for the upcoming years, focusing on expanding cultivation areas, enhancing value addition, and developing new products. Through the DAL, the Government has initiated efforts to increase exports while reducing imports. DAL recently launched the new National Agriculture Sector Plan, which serves as the blueprint for the sustainable development and growth of the agriculture sector. This plan is strategically aligned with the Government's Medium-Term Development Plan and other relevant policies, emphasizing the commercialization of the agriculture sector with a strong focus on value chain development and value-added interventions.

Sago, a vital staple in Papua New Guinea, will receive increased support from sector leaders for downstream processing, which adds value to the raw material. The Manus Provincial Government has allocated K60 000 to the Manus Provincial Department of Agriculture and Livestock (PDAL) to continue the sago value chain development work. Additionally, the government has expressed interest in having FAO assist PDAL in developing a 'Sago Policy' submission to the Manus Provincial Executive Council for long-term budgetary support. However, the East Sepik Provincial Government did not commit any resources to this initiative.

PDAL has committed to advancing advocacy and activities related to sago production within the province. Sago activities have been included in PDAL's 5-year agriculture sector activity plan, for which funding has been allocated. PDAL has verbally indicated that they will seek further technical advice and support from FAO Papua New Guinea to assist with the rollout of the sago work plan. The project has encouraged beneficiaries and the government to adopt appropriate technologies through the application of good agricultural practices.

The pilot project on sago was designed to demonstrate the real benefits of this crop in addressing food insecurity in local communities across Papua New Guinea. FAO played a pivotal role in facilitating collaboration between national and sub-national governments and strengthened ties between decentralized government bodies. DAL, as a national partner, has shown interest in this pilot and is promoting it at the national level with donors to expand the initiative.

Meanwhile, the Manus Provincial Government has already committed funds to advance this initiative within its own province. The participation of officials from DAL, experts, technicians, farmers, institutes, and farms will further promote the dissemination of this technology, ensuring the sustainable extension of its outcomes.

2. Gender equality

Gender equality was strongly promoted by ensuring the significant participation of women in all project interventions, such as training programs, dialogues, and other events. Gender equality was a central focus of the project, with efforts made to guarantee the active and equitable involvement of both men and women in all activities. Consequently, women represented 61 percent of the beneficiary farmers engaged in bio-control activities and 49 percent of the participants in training and other project-related engagements.

3. Environmental sustainability

The project's activities related to Sago production and processing contribute to environmental sustainability through various ecosystem services. These include soil erosion control, land degradation prevention, soil fertility improvement, biodiversity conservation, and carbon sequestration—all which support both local and global environmental sustainability. It is widely recognized that improved planting techniques are key to realizing the full potential of production technology and are the most cost-effective input in overall sago production. The beneficiary farmers retained most of their production for domestic consumption, thereby enhancing household food and nutrition security.

4. Human Rights-based Approach (HRBA) – in particular Right to Food and Decent Work

Sago plays an important role in food security, fulfilling customary obligations, and contributing to peace and conflict resolution. All members of the community have the customary right to harvest and consume natural sago from clan lands. There is a need for improved cultivation technologies and processing methods, as well as the introduction of new and enhanced technologies for future commercialization of sago. It is well recognized that improved planting techniques are the most effective way to maximize production potential and represent the most cost-effective input in overall sago production. Beneficiary farmers retain most of their production for domestic consumption, which strengthens both household food and nutrition security.

5. Technological sustainability

Cultivation through seeds and suckers has led to increased productivity, enhanced resistance to biotic stresses, and added value in the form of better-quality sago products, including extended shelf life and reduced post-harvest losses. The project has successfully designed and conducted field demonstrations on sago cultivation, product development, and cost-effective management practices. Beneficiary farmers were closely involved in every stage, from planning to the implementation of field demonstrations. As a result, the generated technologies have been made easy for stakeholders to adopt, enabling them to continue project activities even after the conclusion of external technical assistance.

6. Economic sustainability

In Papua New Guinea, the profitability of sago production has been well recognized. Therefore, it is expected that the results of this project will also be economically sustainable. The project has already demonstrated profitability, proving that its outcomes are economically viable.

DOCUMENTS AND OUTREACH PRODUCTS

- **Mandal, B. C.** 2022. *Speech by Mr. Bir Chandra Mandal, Head of FAO Country office for Papua New Guinea, at the launching of sago nursery*. Moem Village, Wewak, East Sepik Province.
- **Simbiken, N.** 2022. *Speech by Dr. Nelson Simbiken, Secretary, Department of Agriculture and Livestock of Papua New Guinea, at the launching of sago nursery.* Moem Village, Wewak, East Sepik Province.

- **EmTV.** 2022. *Coverage of the sago nursery launch.* Available at:
  - https://tinyurl.com/2uv3nvhr
  - https://youtu.be/Xtxtrkv5vHo
  - https://youtu.be/FU-eRO4FZb4
- **Jong, F. S., & Galgal, K. K.** 2022. *Overview of sago palm distribution, cultivation, processing, and marketing.* FAOPG TCP Report No.1, Port Moresby.
- **Ehara, H., Naito, H., Mandal, B. C., & Galgal, K. K.** 2022. *Training Workshop on sago planting materials.* FAOPG TCP Report No.2, Port Moresby.
- **Ehara, H., & Toyoda, Y.** 2022. *Setting about the work for establishing sago palm nursery in targeted provinces.* FAOPG TCP Report No.3, Port Moresby.
- **Galgal, K. K., Ehara, H., & Toyoda, Y.** 2022. *TCP/PNG/3901 "Enhancing food security and combating climate change through scaling-up sago production" Project inception mission to Wewak.* BTOR No.1, August 2022.
- **Galgal, K. K., & Jong, F. S.** 2022. *Rapid Rural Appraisal to up-scale Sago Production in Manus for TCP/PNG/3901 "Enhancing food security and combating climate change through scaling-up sago production".* BTOR No.2, 28 September 2022.
- **Galgal, K. K., Ehara, H., Naito, H., & Boloti, V.** 2022. *Mission to Wewak to set up the Sago Nurseries under the project "Enhancing food security and combating climate change through scaling up sago palm production" (TCP/PNG/3901).* BTOR No.3, 11 November 2022.
- **Ehara, H., Naito, H., & Mishima, T.** 2023. *Training report and report of the number of farmers trained.* FAO TCP Report No.4, pp. 10, Port Moresby.
- **Ehara, H., Naito, H., & Mishima, T.** 2023. *Training Report and Report of the number of farmers trained.* FAO TCP/PNG/3901 Report No.5, 30th November 2023.
- **Toyoda, Y., & Mishima, T.** 2023. *Training Report and Report of the number of farmers trained, Manus.* FAO TCP Report No.6, pp. 6, Port Moresby.
- **Ehara, H., & Mishima, T.** 2023. *Training Report and Report of the number of farmers trained.* FAO TCP/PNG/3901 Report No.7, 30 November 2023.
- **Galgal, K. K., Mandal, B. C., Ehara, H., Mishima, T., & Philip, T.** 2023. *Mission to Wewak for the launching of the Sago Nurseries and demonstration of sago rasping machine under the project "Enhancing food security and combating climate change through scaling up sago palm production" (TCP/PNG/3901).* BTOR No.4, 29 May 2023.
- **Galgal, K. K., & Sonnie, J.** 2023. *Mission to Manus to discuss with the Manus Provincial Government, relevant partners, and institutes for the upscaling of sago production - TCP/PNG/3901.* BTOR No.5, 23 April 2023.
- **Galgal, K. K., Bai, L., Toyoda, Y., & Mishima, T.** 2023. *Mission to Manus for capacity training on improved cultivation, downstream processing, and value sago palm.* BTOR No.6, 19 August 2023.
- **Galgal, K. K., Millan, G., Ehara, H., & Naito, H.** 2023. *Mission to Wewak for capacity training on improved cultivation, downstream processing, and value sago palm.* BTOR No.7, 31 August 2023.


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ACHIEVEMENT OF RESULTS - LOGICAL FRAMEWORK

Expected Impact	**Enhanced climate change resilience and improved food security in the disaster-prone coastal population sectors of Papua New Guinea**		
Outcome	Increased sago production through large scale cropping, management and value addition practices in the two targeted locations and one existing wild sago palm stand		
	Indicator	Percentage increase in hectares of sago palm cropping.	
	Baseline	0	
	End Target	10%	
	Comments and follow-up action to be taken	A sago nursery was established in East Sepik Province, where a total of 3 400 seedlings were raised. Of these, 100 seedlings were transplanted onto 1 hectare of land, which was brought under cultivation using seedlings raised from seeds in the nursery. Improved sago cultivation and processing technologies were introduced to communities in East Sepik and Manus Provinces. Additionally, 548 individuals from sago-dependent communities across 15 villages in these provinces received technical assistance on nursery development, management, and post-harvest processing to enhance starch production.	
Output 1	Implemented an improved Sago cultivation system in 100 hectares of coastal areas in two locations of the targeted province		
	Indicators	Target	Achieved
	- Coastal area where improved sago cropping, and management practices have been introduced and adopted. - Monitoring reports.	- 100 ha - 1 ha	Partially
Baseline	300 000 ha		
Comments	Eight training sessions were conducted in Sepik and Manus. Sago cultivation was achieved on a total of 1 hectare, with 1 hectare in Sepik and none in Manus. Additionally, 15 reports are available: 7 from the Tokai National Higher Education and Research System in Japan, 8 from the FAO Country Office's back-to-office reports, and three publications.		
Activity 1.1	Establish three sago palm nurseries each consisting of 30 000 plants		
	Achieved	Partially	
	Comments	A nursery in Sepik has successfully raised 3 400 plants, while there are currently no nurseries in Manus. Of the plants raised, around 90% germination was achieved from the collected fruits. The Provincial Government and the National Department of Agriculture and Livestock have agreed to continue supporting these activities.	
Activity 1.2	Establish a 100-hectare sago palm cropping in the suitable coastal zone		
	Achieved	Partially	
	Comments	One hectare in Sepik and none in Manus have been identified. The Provincial Government will continue its extension activities.	

<table>
<tr><td rowspan="4">Output 2</td><td colspan="3">Improved post-harvest management practices and value addition methods introduced in the targeted sago palm cropping zones and in 10-hectares of the existing sago palm stand areas in wild</td></tr>
<tr><td>Indicators</td><td>Target</td><td>Achieved</td></tr>
<tr><td>Improved post-harvest handling procedures introduced.</td><td>- Improved post-harvest handling procedure and processing of sago palm starch in the existing 10 ha pilot stand.
- Two small scale community-based units.</td><td>- Yes
- Yes</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>Baseline</td><td colspan="3">- 0
- 0</td></tr>
<tr><td>Comments</td><td colspan="3">Ten-hectare demonstration plots were established with the Sago Community-Based Management Units. To support further expansion, additional Sago Community-Based Management Units will be formed based on location. These new units will receive training from the already trained farmers and government staff, ensuring a continuous transfer of knowledge and skills within the community.</td></tr>
<tr><td rowspan="3">Activity 2.1</td><td colspan="3">Introduction of improved methods in post-harvest handling of sago palm trunks, sago palm starch extraction and processing in a pilot plot of 10 ha existing wild sago palm area</td></tr>
<tr><td>Achieved</td><td colspan="2">Yes</td></tr>
<tr><td>Comments</td><td colspan="2">Improved post-harvest handling methods were introduced across 15 villages in Manus and East Sepik Provinces, covering a total of 15 hectares. Also, the introduction and demonstration of portable mechanized sago rasping, which yields higher starch output compared to manual rasping, reached 150 individuals in three villages within East Sepik Province. To further support these initiatives, the government will allocate funds to extend post-harvest and product development activities.</td></tr>
<tr><td rowspan="3">Activity 2.2</td><td colspan="3">Introduction of value addition techniques for sago starch, storage and packaging based on utility pattern and consumption capacity in small-scale community-based units (one unit per location).</td></tr>
<tr><td>Achieved</td><td colspan="2">Partially</td></tr>
<tr><td>Comments</td><td colspan="2">Two training and demonstration sessions on value addition techniques for sago starch, including storage and packaging, were conducted—one in the Sepik province and the other in the Manus province. With the support of various stakeholders, efforts in value addition, product development, and value chain enhancement will continue.</td></tr>
<tr><td rowspan="4">Output 3</td><td colspan="3">Developed sago palm cropping and management capacities of farmers and technical staff in the two targeted locations and sago palm cultivation experts at the government and community levels</td></tr>
<tr><td>Indicators</td><td>Target</td><td>Achieved</td></tr>
<tr><td>Number of farmers and agriculture and forestry development planners trained.</td><td>300</td><td>Yes</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>Baseline</td><td colspan="3">0</td></tr>
<tr><td>Comments</td><td colspan="3">A total of 548 farmers, along with agriculture and forestry development planners, have received training. The Manus Provincial Government has allocated K60 000 to Manus PDAL to support the ongoing development of the sago value chain. Moreover, PDAL has expressed interest in seeking FAO's assistance in developing a 'Sago Policy' for presentation to the Manus Provincial Executive Council, aiming to secure long-term budgetary support. PDAL remains committed to its advocacy and active involvement in sago production activities within the province. As part of this commitment, sago activities have been integrated into their 5-Year Agriculture Sector Activity Plan, which has already secured funding.</td></tr>
<tr><td rowspan="3">Activity 3.1</td><td colspan="3">Training of 240 farmers and 60 agriculture/forestry development planners with equal gender equality on sago palm nursery development, pest management, starch production, operation and maintenance of cultivation units, harvest and post-harvest management and value addition.</td></tr>
<tr><td>Achieved</td><td colspan="2">Yes</td></tr>
<tr><td>Comments</td><td colspan="2">A total of 548 farmers, along with agriculture and forestry development planners, received comprehensive training in various aspects of improved sago palm cultivation, harvesting, and post-harvest management. Gender equality was a central focus of the project, with 61% of women farmers actively participating in all aspects of improved sago starch production activities. 49% of the women were involved in the training sessions and other related initiatives.</td></tr>
</table>

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

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