

NATIONAL AGRICULTURAL RESEARCH INSTITUTE



# NARI ANNUAL IMPLEMENTATION PLAN 2024

CORPORATE PLAN No. 1/2024

Promoting Excellence in Agricultural Research Sustainable Development

*Promoting Excellence In Agricultural Research For Sustainable Development*

# **NARI Annual Implementation Plan 2024**

## **Corporate Plan**

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# **NARI Annual Implementation Plan 2024**

(Corporate Plan 1/2024)

National Agricultural Research Institute

Lae, Papua New Guinea

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## Acronyms and Abbreviations

<b>ACIAR</b>	Australian Centre for International Agricultural Research	<b>ICDF</b>	International Cooperation and Development Fund
<b>ADD</b>	Agricultural Development Domain	<b>ICT</b>	Information & Communications Technology
<b>AIP</b>	Annual Implementation Plan	<b>IFPRI</b>	International Food Policy Research Institute
<b>AR4D</b>	Agriculture Research for Development	<b>IRC</b>	Islands Regional Centre
<b>ARSF</b>	Alumni Research Support Facility (ACIAR)	<b>ITPGRFA</b>	International Treaty for Plant Genetic Resources for Food and Agriculture
<b>ASF</b>	African Swine Fever	<b>JICA</b>	Japan International Corporation Agency
<b>BSFL</b>	Black Soldier Fly Larvae	<b>LLG</b>	Local Level Government
<b>BWAP</b>	Banana Wilt Associated Phytoplasma	<b>M&amp;E</b>	Monitoring and Evaluation
<b>CC</b>	Climate Change	<b>MOU</b>	Memorandum of Understanding
<b>CM</b>	Centre Manager	<b>MOV</b>	Means of Verification
<b>DEAT</b>	Department of Foreign Affairs and Trade	<b>MRC</b>	Momase Regional Centre
<b>DG</b>	Director General	<b>MTDP</b>	Medium-term Development Plan
<b>DOI</b>	Digital Object Identifier	<b>NAIC</b>	National Agricultural Insect collection
<b>EHP</b>	Eastern Highlands Province	<b>NAQIA</b>	National Agricultural Quarantine Inspection Agency
<b>EU</b>	European Union	<b>NARI</b>	National Agricultural Research Institute
<b>FC</b>	Financial Controller	<b>PGR</b>	Plant Genetic Resources
<b>FPDA</b>	Fresh Produce Development Agency	<b>PIP</b>	Public Investment Program
<b>GESI</b>	Gender and Social Inclusion	<b>PM&amp;E</b>	Planning Monitoring & Evaluation
<b>CGIAR</b>	Consultative Group on International Agricultural Research	<b>PNG</b>	Papua New Guinea
<b>GHG</b>	Green House Gases	<b>PPT</b>	Power Point
<b>GIS</b>	Geographical Information Systems	<b>RA</b>	Result Area
<b>GLIS</b>	Global Information System for PGR	<b>SHP</b>	Southern Highlands Province
<b>GoPNG</b>	Government of PNG	<b>SIP</b>	Strategic Implementation Plan
<b>GW</b>	Galip Weevil	<b>SOP</b>	Standard Operating Procedure
<b>HARC</b>	High Altitude Regional Centre	<b>SRC</b>	Southern Regional Centre
<b>HRC</b>	Highlands Regional Centre	<b>SRF</b>	Strategy and Results Framework
<b>HT</b>	Human Talent	<b>TC</b>	Tissue Culture
<b>HTMDS</b>	Human Talent Management and Development Strategy	<b>TO</b>	Technical Officer
<b>IAEA</b>	International Atomic Energy Agency	<b>TOT</b>	Training of Trainers
		<b>WHP</b>	Western Highlands Province

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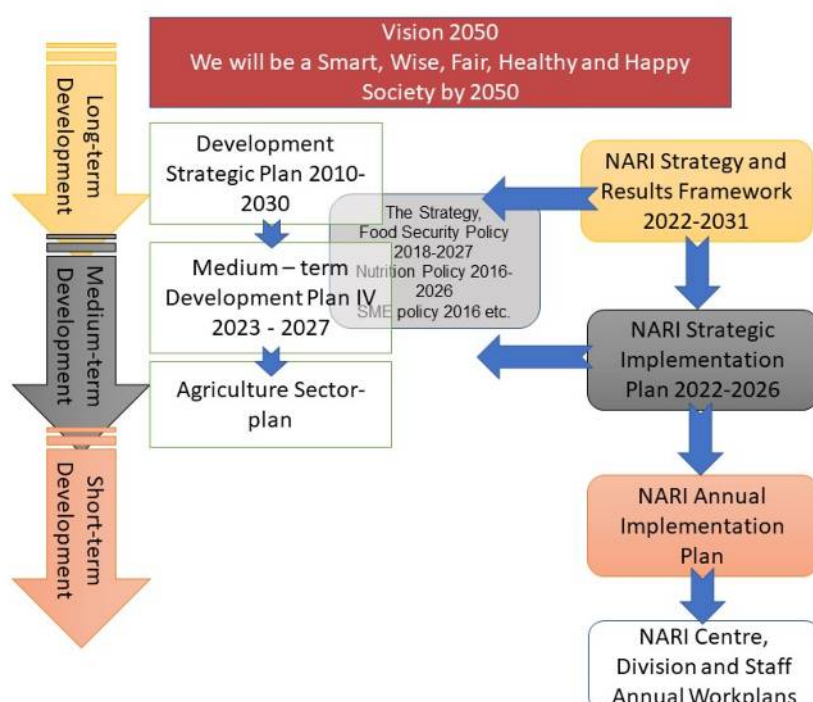
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# NARI Corporate Annual Implementation Plan 2024

## 1. Introduction

The National Agricultural Research Institute (NARI) is a government funded statutory institution that operates within the strategic framework set by the PNG Government through long and medium-term plans viz. Papua New Guinea Vision 2050, the Development Strategic Plan (2010-2030), the Medium Term Development Plan IV 2023-2027 and other national policies. NARI's institutional objectives are well aligned with the national and sector plans (Figure 1).



The Strategy and Results Framework (SRF) II 2022-2031 provides the overall context and direction for the priorities set by the Institute in this 10-year planning time frame. The Strategic Implementation Plan (SIP) 2022-2026 outlines the 5-year priorities and target results for the Institute to achieve in its contribution in AR4D. The NARI AIP 2022 is the last tier document in the NARI planning and implementation process as depicted in Figure 1. The plan provides an overall framework for NARI's Research for Development priorities, key performance indicators and planned implementation in 2024.

The AIP is an important planning and management tool to ensure that implementation processes required for achieving short to medium term outcomes are followed. Annual plans assist in allocation of resources, monitoring implementation progress of activities and aid in making necessary adjustments and taking corrective actions. They also allow for on-

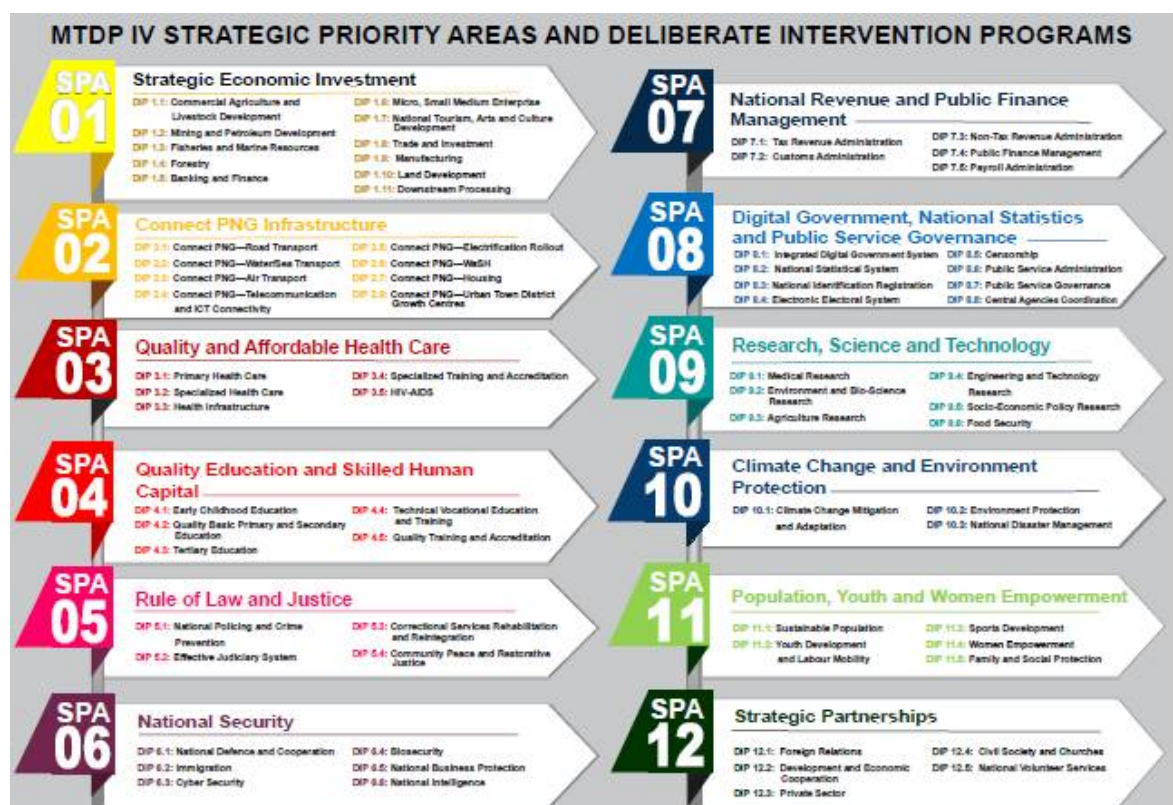
going planning, evaluation and periodic reviews and reporting and further aid in impact assessment exercises.

The implementation of the annual plan is coordinated from NARI's eight establishments, comprised of Highlands Regional Centres at Aiyura and Tambul; Momase Regional Centre at Bubia including Labu; Islands Regional Centre at Keravat; Southern Regional Centre at Laloki; Kilakila (Insectory and Chemistry Laboratory) in Port Moresby and the Head Office at Bubia.

The AIP will be monitored on a quarterly basis for implementation of activities and inputs, and realisation of outputs and outcomes. This will be summarised in a six-monthly progress report. An annual report will provide an assessment of delivered outputs, accomplished milestones and achieved outcomes as stated in the annual implementation plan.

## 2. Alignment with the Medium-term Implementation Plan IV

The Government of PNG through the Department of National Planning and Monitoring as responsible agency has launched the Medium-term Implementation Plan IV in late 2023. The theme of this plan is “*National Prosperity through Growing the Economy*”. The MTDP IV is a 5-year planning framework (Figure 2) for the Governments priority development agenda and informs the annual Development Budget. All Sectors, Provincial, District/LLG and Organisations are tasked to align its priorities with the MTIP IV.



NARI submitted the alignment of the Institute's priorities with the MTDP IV framework in November 2023 (Annex 1).

## 3. Structure of the Annual Implementation Plan

The AIP 2024 is linking to the framework outlined in the SIP 2022-2026 and the anticipated outputs identified in the seven Result Areas (RA) within the three major priorities viz. Markets, Value Chains and Trade; Resilient Systems; Nutritious Food and Healthy Diets.

The different sections of this plan are organised by Priority and Result Areas highlighting the anticipated achievements coming from the implementation of the various projects and studies funded by donor grants, the GoPNG Public Investment Program and the Institute's own resources (Annex 2) while more details on the planned achievement of Institute Results can be found in Annex 3. The last sub-section shows the key outputs planned as part of Institutional Management and Development. Routine activities and associated outputs in day-to-day management are not displayed.

## **2.1 Priority 1 – Economic Development and Value Chains**

### **2.1.1 RA Foresighting and Advocacy**

The Result Area Foresighting and Advocacy is broadly designed to conduct strategic research in identifying AR4D investment opportunities and gathering information that will inform policy and priority setting at national and institutional level.

The major priority in 2024 for NARI is to build its capacity in the area of social, socio-economic and policy research.

### **2.1.2 RA Value Chain Support**

The second Result Area focuses on specific priority value chains (see SIP Annex 3 for the prioritisation methodology) and uses a whole-value chain approach to address key bottlenecks that require research innovation for greater efficiency and productivity and ultimately greater returns to value chain actors. The initial focus as per the prioritisation exercise in 2021 was on Sweetpotato, Potato, Banana, Galip nut, and Pork Product Value chains. However, since then the focus has changed with opportunities arising in Taro and Rice production, a clear direction from the newly launched National Agricultural Sector plan for commercialisation of the food production system. Hence, the focus will shift to include Taro and Rice supply and value chains aside from completing current work on selected interventions in support of the sweetpotato, pig and galip nut value chains.

In 2024, NARI with its main partner the University of Queensland will conclude a long-term project supported by the ACIAR. The major output of this project will be soil management packages that is suitable for use of farmers moving from subsistence production towards a commercial production of sweetpotato. Other work as part of sweetpotato value chain improvement will be to determine the attainable yield of sweetpotato varieties currently preferred for commercial production. Similar work will be done for banana varieties currently in demand in the market place. This information is important to understand current yield gaps and how technology adoption can improve productivity, efficiency and eventually profitability as well.

In support of the potato value chain, NARI will release recommendations on rapid propagation techniques using cuttings as an alternative technique to generate planting material especially in remoter regions where supply with seed potatoes is difficult.

NARI will continue supporting the potato and sweetpotato industry with supply of tissue-cultured potato plantlets to its partner FPDA and pathogen tested quality sweetpotato cuttings to stakeholders as foundation material for further production of quality seed material.

R4D support in the commercialisation drive in taro and rice production will include the development of planting material and seed production standards and the development of research interventions targeting gaps in technology and knowledge for the scaling of taro and rice production in the country such as production system and best practices studies, mechanisation options, economic assessments etc. This will include the mobilisation of necessary resources including research staff and infrastructure (see Section 3).

### **The key outputs from the RA Value chain support for 2024 include:**

- Soil management recommendations for improved sweetpotato production
- Information on attainable yield of potato, banana and sweetpotato varieties in a commercial setting
- Quality planting material for root, tuber crops and banana
- Information package summarising achievements and lessons learnt on building a sustainable Galip Nut Value chain;
- Information on improved production practices (harvest systems, pest management, tree improvement);
- Key achievements of NARI's investment into Galip value chain development available on the NARI Website;
- Information and maps available on the impact of ASF in local household of Tambul District and disease areas
- Quality taro planting material production standard and rice seed production standard and supply system;
- Key research intervention supporting rice and taro commercial development planned and funding mobilised;

Further details on planned achievements in RA 2 can be found in Annex 3a.

## **2.2 Priority 2 Resilient Systems**

### **2.2.1 RA Household Resilience**

Result Area 3 is focusing on addressing household resilience issues to increase capacity of households and communities to engage in agricultural production using a combination of technologies, strategies and practices that enable more stable production in the face of climate change and other indirect impacts from intensification of commercial crop and livestock production on food and eco-systems exacerbated by climate change. There are two major sub-objectives in this RA, viz. Climate Smart Solutions and Disaster Response.

#### ***Climate Smart Solutions***

In the past over 10 years, NARI has focused a lot of its efforts on participatory action research working with communities and local partners in GO and NGO across the country to introduce understand their needs in responding to climate and socio-economic changes and increase their skills and knowledge in using climate smart crop and livestock technologies and farming practices.

In 2024, the Institute will shift its focus to concentrate more on the development of new innovations or the adaptation of climate smart innovations that have been successfully applied in other regions with similar socio-economic setting. At the same time, NARI will continue to build on the partnerships it has established with partners in Provinces across the country and further assist in building capacities of extension agents supporting the smallholder communities.

The major expected results in this RA are as follows (details are in Annex 3b):

- Climate resilient crop varieties and technologies assessed (NERICA rice, wheat varieties)

- Climate smart farm practices and strategies assessed and recommendations available
  - Traditional Cropping calendars documented
  - Crop intervention matrix and seasonal advisories developed
- Capacity of extension agents in vulnerable districts in climate smart use of agriculture production technologies and practices built;

### ***Disaster response***

NARI will continue to strengthen its internal capacity as well as capacity of partners to make a contribution as part of disaster response. The major contribution will be made in contributing to the improvement of weather data and other climate forecast information and agricultural rehabilitation efforts with the supply of foundation planting materials and breeding stock.

The following key results are to be delivered in 2024:

- Key agricultural rehabilitation crops identified and processes in place for deployment in disaster situations;
- Weather data captured from the AWS at all Centres and captured in central database
- Climate forecast information sharing platform for Hela and SHP;

### **2.2.3 RA Biosecurity**

NARI contribution to the country's Biosecurity management is in conducting relevant research in the management, monitoring and surveillance especially of endemic biological pest and disease threats to agricultural, horticultural, agro-forestry, and aquaculture production systems, as well as natural eco-systems. NARI's contribution will be in two major areas, viz. Biosecurity management and Biosecurity preparedness

#### ***Biosecurity Management***

The focus in 2024 will remain on management options for the Diamond-back moth, a serious pest in vegetable production, the Fall Army Worm, a new serious pest in larger scale corn production, the Galip weevil (see Section 2.1.2), Banana Wilt-Associated Phytoplasma (BWAP) affecting bananas especially in Madang and Morobe as well as work on ASF (see Section 2.1.2).

#### ***Biosecurity preparedness***

In late 2023, NARI started to coordinate a new initiative supported by the CABI PlantWise Plus Program to build capacity for improving the plant health system in PNG. The activities will continue in 2024 and focus on three major areas, viz.

- Pest preparedness: coordinating and strengthening systems for detection and response to pest outbreaks
- Safe and efficient use of pesticides: increasing awareness of, access to and use of affordable integrated pest management solutions
- Farmer advisory services: enhancing knowledge and uptake of integrated pest management practices through responsive digital advisory tools

The National Agricultural Insect Collection facility at Kilakila in Port Moresby, is an important service that the Institute is providing to stakeholders in term of diagnostics but also for the purpose of trade facilitation. Work will continue in 2024 with the digitisation of records for easier online access to stakeholders.

The major achievements planned for 2024 in this RA include:

- Fall Army Worm Management Package relevant to corn production at different

scales;

- Baseline sensitivity information on novel insecticide for control of Diamondback Moth
- Management strategies for control of BWAP
- Plant Health Clinics established in pilot locations by NARS partners;

Further details on expected outputs in this RA can be found in Annex 3b.

## **2.2.4 Result Area Genetic Resources**

NARI is the custodian of the Genetic Resources for Food and Agriculture diversity which is an important heritage and basis for food security and the advancement of commercial crop and livestock production in the country. This RA covers a range of core activities of NARI under the two sub-headings of Genetic Resources Management and Genetic Resources Use and Access.

### ***Genetic Resources Management***

NARI is maintaining a number of PGR *ex situ* collections at its various regional centres. The maintenance is an on-going responsibility and the major aim is to conserve the accessions with the aim to use them in future crop improvement programs. Hence, on-going characterisation of the collections as part of pre-breeding activities and maintenance of databases that capture the passport and characterisation data are important tasks for NARI. A number of activities are in progress to update characterisation data for sweetpotato collections and upload data into international databases for wider access to stakeholders. In 2024, NARI will supply true seed generated from a polycross nursery of SP accessions conserved in the National SP Germplasm collection at Aiyura to the Svalbard Vault in Norway, a long-term international seed storage facility.

Funding has also been secured from the CGIAR Genebank Initiative to improve the management of PGR *ex situ* collections with the introduction of standard operating procedures and the installation of the GRIN-Global PGR management system, which is a PGR management system used internationally to manage PGR data and information.

NARI also secured funding from the ITPGRFA Benefit-sharing fund to start work on breadfruit genetic resources. This is a 4-year project and will involve collection and characterisation of breadfruit diversity as well as raising awareness on breadfruit as a crop with commercial potential and its important for food security. NARI will also start work on assessing kava genetic resources supported through funding by the GoPNG PIP.

NARI will be honouring reporting requirements as part of PNG's international obligations as signatory to international treaties and membership with FAO Commission on PGR.

### ***Genetic resources use and access***

In 2024, NARI will conclude the work on developing new promising orange and purple fleshed sweetpotato varieties as well as varieties with good performance under soil-moisture deficit conditions which was supported by a grant from the ITPGRFA Benefit Sharing Fund. This intervention tested participatory breeding and conservation approaches for SP PGR. The final activities will also provide an assessment of the lesson's learnt and how this can further inform PGR conservation strategies for the country.

In 2024, NARI will also start to do more work on the evaluation of vegetable varieties starting with a range of bean species but also tomato, cucumber and other vegetable crops. The Institute is focusing on open-pollinated varieties in order to support a more informal seed system that will allow farmers to save and re-use their own seeds.

The other important area that NARI is focusing on is the improvement of access to quality foundation planting material and breeding stock. As part of this initiative, the Institute will start engaging with relevant stakeholders to support the development of a National Seed Policy that takes into account the specific context of PNG culture and systems, recognises rights of resource owners, the traditional knowledge associated with traditional crops and sets the platform for appropriate legislation necessary to support the growth of the Agriculture Sector, a domestic seed industry and the commercialisation of crop production in the country.

The major results expected for the RA Genetic Resources with the two sub-objectives are as follows (see Annex 3b for more details):

- Sweetpotato PGR data made available on Genesys and the Global Information System with DOIs assigned;
- All PGR collections at NARI captured with a full set of accession and passport data in a database;
- New rice and vegetable varieties available to stakeholders
- Livestock Breeding stock data captured in a database;
- Reports to FAO Commission on PGR and ITPGRFA submitted in timely manner;
- Diversity of SP varieties increased in pilot sites in Morobe, Madang, EHP, Central;
- System established at NARI to capture production and distribution of breeding stock and planting material;
- Infrastructure improved to produce, process and store planting material safely at NARI Centres;
- Infrastructure and facilities to improve the production of breeding stock at NARI Centres;
- Draft Seed Policy based on stakeholder consultations and assessments

## **2.3 Priority 3 Nutritious Food and Healthy Diets**

Priority 3 is covering the contribution that NARI will make in addressing the serious systemic problem of malnutrition in the country. There are important linkages between agriculture and nutrition. This priority has one Result Area with two sub-objectives that NARI will be contributing to with relevant interventions.

With support from a grant from the GoPNG PIP, NARI will work with partners in Madang and Morobe to address the low level of production of livestock in various districts and pilot communities that show high levels of malnutrition in health statistics. In 2023, the NARI team conducted an extensive baseline and needs assessment survey in the target districts. The information is used to customise the planned interventions in two pilot sites (Bogia, Madang Province and Kome, Morobe Province), finalise research studies in response to information gaps and roll out scaling activities that involve the other participating districts in the two provinces.

In 2024, the following major results are expected to be achieved (see Annex 3c for details):

- Capacity in partner districts in Madang and Morobe to manage and operate rural poultry production units improved;
- Demonstrated changes in aspirations of selected family teams in 2 target project sites in Morobe and Madang for improving food production systems with focus on small livestock production
- Information materials on nutritional properties of crop and livestock products

## **2.4 Cross-cutting Areas:**

Three Result Areas, viz Scaling, GESI and Communication for Change, have been considered cross-cutting to the above Result Areas, because defined strategies are applicable across the whole research agenda.

Scaling in a wider context needs to encompass all factors that influence change processes necessary to achieve a larger scale impact while addressing GESI needs will require mainstreaming GESI dimensions into planning and implementation as well as targeted actions to specific needs. Communication for Change is a critical area for establishing successful partnerships, informing different stakeholders and increasing their knowledge and understanding of innovations in AR4D. However, receiving feed-back from the different stakeholders is equally important to inform the Institute's strategies and priorities (see Figure 3 in the SIP).

The SIP indicates a range of targeted outputs in each of the cross-cutting areas that will have its own dedicated interventions and achievements. However, it also has to be understood that achievements in the cross-cutting areas would be reflected in the results achieved from interventions in the different RA due to its cross-cutting nature and the need for contribution towards achieving RA objectives.

In 2024, through the support from the GoPNG PIP, NARI will initiate research interventions targeted at piloting options for increased mechanisation of agricultural production. A concept of 'mechanisation hubs' will be further developed and tested. Given current priorities, initial focus will be rice farming machinery.

NARI is mandated to provide a number of technical services. They are considered cross-cutting and aligned with the three cross-cutting areas. Such services include the production and supply of foundation planting material and breeding stock especially small livestock (see Section 2.2.4, Table A4b) . Capacity building and up-skilling of partners and extension providers with new or improved agricultural technologies and practices or other areas of capacity building in improving awareness and understanding on addressing constraints and opportunities in the sector. Other important services include the provision of analytical and diagnostic services from NARI's Chemical Laboratory, the National Agricultural Insect Collection and information services that include access to scientific, technical, socio-economic databases that NARI is maintaining.

The major expected achievements as part of Cross-cutting areas include (see details in Table A3d).

- Mutual understanding reached with Provincial and District Administrations on scaling of skills and knowledge and access to technologies formalised in MOUs;
- Active engagement with GOs and NGOs on upskilling of extension workers and increasing access to technical information on crop and livestock production;
- NARI's approach to TOT formalised and relevant modules taking into account Gender and literacy levels;
- Support to increased mechanisation in agricultural production initiated;
- Key scaling factors in taro and rice commercial development identified and actioned;
- Annual Innovations Show 2024 staged;
- Communication Strategy developed;
- Increased information digitisation;
- Priority research management databases developed.

### **3. Strengthening Institutional Efficiency and Effectiveness**

As pointed out in the SIP 2022-2026, achievement of expected results by NARI cannot happen without a solid foundation of structures, systems and adequate resources. The critical areas remain as follows:

- The chronic under-funding of the Institute and support for delivery of AR4D, the need for diversification of income sources for the Institute and raising of the recurrent funding levels;
- The on-going need to manage change and promote changes in mindsets, attitudes and perceptions on what constitutes agricultural research and the role it plays in a system;
- Changes in the role of NARI regional centres from a research station to a multi-functional centre demonstrating best agricultural practice and serving as hubs for scaling of agricultural innovations;
- Changes in mobilising multidisciplinary and cross-organisational teams to address AR4D challenges and opportunities.

There are a number of major policy reviews and revisions planned that are important for setting future directions in the Institute.

a) The NARI Act from 1996 has not been reviewed since it was first passed by Parliament the same year. The review and if necessary a revision is important for the Institute to remain relevant and responsive to the changing needs of the agriculture sector.

b) The organisational restructuring exercise to a) ensure that the Institute has an organisational structure that can deliver the SRF II, SIP and Annual Plans, and b) to comply with requirements under the public service framework so NARI gets the required allocation for the necessary workforce in the annual budget appropriations.

c) The overdue review of NARI Management Standards started in 2023 will continue into 2024 including development of new Standards as necessary.

The implementation of the AIP 2024 is supported by the grants given to the Institute from the GoPNG recurrent and development budgets, project grants from national and international donors as well as minor income from internal revenue generating activities. The 2024 Income and Expenditure Plan is presented in Annex 4. There has been a marked increase in the 2024 appropriation in the recurrent budget as result of intense advocacy and lobbying by Senior Management. This will provide some relief to the systemic under-funding of the Institute and give opportunity to address some urgent needs to the maintenance of Institute infrastructure. It remains that the funding level provided for 2024 has to not only be maintained but further increased for NARI to deliver on its functions adequately.

In response to the increasing resourcing needs, the NARI Council also approved the establishment of a NARI Business arm, the NARI Enterprise Ltd. In 2023. The full establishment of this independent entity within the NARI overall legislative and management framework will continue in 2024 with establishing a governance and management structure, management processes and integration of its operation into the NARI Regional Centre set up.

The other major initiative supported by the PNG Government through the Minister for Agriculture is the plan to establish a Sector wide Cadetship Program that NARI has been requested to coordinate. This is an important undertaking and vital to ensure that there are competent and skilled professionals available to satisfy the diverse current and future needs in agricultural research and agricultural development. In 2024, the Institute will work with other sector agencies to set the foundation for the cadetship program.

The major achievements planned for 2024 as part of improving Institutional Efficiency and Effectiveness include (see more details in Annex 3, Table A3e):

- Review of the NARI Act 1996 conducted and any necessary revisions captured

- Review of organisational structure and proposal for adjustments approved through Council and SCMC and captured in the 2025 Budget Submission for recurrent budget allocation;
- NARI Management Standards reviewed and revised and new Standards developed for arising areas of need;
- Key research and farm infrastructure developed at NARI Centres
- NARI Enterprise Ltd fully established as an independent entity within the overall Institutional Framework;
- Cadetship program established;
- Training plan for NARI staff developed;
- Online leave and assets management system operating;
- New Accounting Software operating across NARI Centres

## Annex 1. Alignment of NARI priorities with MTDP IV Planning Framework

The following alignment of NARI priorities with the MTDP IV framework was submitted to DNPM in November 2023 and approved. The full alignment plan is available in a separate document.

DIP Reference	MTDP IV Investment Programs	Sector Aligned Investment Programs/Projects	Implementing Agency	Location	MTDP IV Funding Estimates (K'mill)				Total Cost(K'mill)	Funding Sources
					2024	2025	2026	2027		
1.1,1.5, 1.11, 9.3	National Agriculture Development Program	1. Scaling for agricultural SME production and commercial value-added products	NARI/DAL/ Commodity boards	National	14.7	10.0	8.2	7.2	40.1	GoPNG
	Fresh Produce Development Program									
	Agriculture Research									
1.1	Rice Development Program	2. Value chain innovations supporting the scaling of rice production in the country	NARI/DAL	HRC, IRC, SRC, MRC		2	2	2	6	GoPNG
1.1, 1.11	National Livestock Development Program	3. Stakeholder access to and supply with quality improved small livestock breeds (village chicken, ducks, goats,Honey bees) and breeding stock improved	NARI/DAL/ LDC	HARC, IRC, MRC, SRC		4	4	4	12	GoPNG
1.1, 1.11	Spice Development Program	4. Increased access to improved varieties and planting material and production methods of priority spices supporting value chain development	NARI/DAL/ Spice Board	IRC, MRC, SRC		1.5	0.5	0.5	2.5	GoPNG

9.2	Environment & Bio-science Research Support Program	5. Exploration, conservation and use of diversity of PNG Genetic resources for Food and Agriculture	NARI/Prov. Govt/CEPA	National		2.5	1	1	4.5	GoPNG
9.3 and 9.6	Agriculture and Food Security Research Support Program	6. Equipping and positioning NARI to better deliver research results for PNG economic and development outcomes	NARI	National	2	2				PIP
		7. Building Agriculture research capacity through National the Cadetship program	NARI and NARS	National	10	8	6	6	30	GoPNG
9.5	Socio Economic Policy Research Support Program	8. Increased capacity for delivering policy recommendations on agricultural investment strategies and economic feasibility of fresh, processed and non-food agricultural production at different scales	NARI			2	2	2	6	GoPNG/Donors
9.6	Food Security	9. Smallholder farming and rural communities have an increased adaptive capacity to cope with climate change	NARI and partners	National		2	2	2	6	GoPNG
		10. Sustainable poultry, aquaculture and goat farming for economic and nutritional well-being of rural communities throughout PNG	NARI and selected Districts	Madang and Morobe	2	2	2	2	8	PIP

## Annex 2. List of implemented projects and studies in Result Areas 1-7 in 2024

No.	Project Code	Name of Project/Study	Funding Source	Donor Code	Total Budget	Lead Officer	NARI Centre	Start date	End date
1	A10224	Agro-morphological Characterisation of PNG Highlands Sweetpotato Germplasm for Establishment of Core Collection and their Conservation	NARI Research fund	A10224	PGK 38,527	Boney Wera	HRC	2022/01/01	2024/12/31
2	A10225	Responding to emerging pest and disease threats to horticulture in the Pacific islands	ACIAR	HORT/2016/185	AUD 179,719	Robert Geno	HRC	2020/01/01	2023/09/30
3	A10226	Sustaining soil fertility in support of intensification of sweetpotato cropping systems Phase II	ACIAR	SLAM/2017/041-SMCN/2012/105	AUD 955,991	William Sirabis	HRC	2020/05/22	2024/05/01
4	A10229	Evaluation on the performance of two Potato Rapid Multiplication Techniques on growth, potato tuber yield and quality of three commercial potato varieties at Aiyura and Tambul Stations	PIP	562-3101-1-22964	PGK 16,220	W. Maso	HRC	2022/05/01	2023/09/01
5	A10230	Preparedness to Cope with Climate Change induced Stresses (Drought (frosts), Excess Moisture and Salinity) - (PIP R&D Component 1)	PIP	562-3101-1-22964	PGK 6,200,000	Johannes Pakatul	HRC	2017/01/01	2023/12/01
6	A10232	Regeneration, Conservation and Safety Duplication of Papua New Guinea Sweetpotato Germplasm Collection through Botanical Seeds at the Svalbard Global Seed Vault	BOLD/Crop Trust	Cont-0769	USD 56,153	Boney Wera	HRC	2022/04/02	2024/01/31
7	A10237	Growth response of pathogen-tested sweetpotato cultivars to nitrogen application methods in Highlands agro-ecological zones of Papua New Guinea	APSF	APSF23022	A\$36, 580	William Sirabis	HRC	2023/07/01	2026/06/30
8	B40323	Investigation into Banana Wilt Associated Phytoplasma in the Markham valley	NARI Research Fund	B40323	PGK 87,648	Gou Rauka	MRC	2018/11/01	2022/06/30
9	B40325	Banana (Musa sp) and Sweet potato in vitro mutagenesis in Papua New Guinea	IAEA/NARI Research Fund	n/a	PGK 6,512.00	Joel Pilon	MRC	2019/05/01	2023/12/31
10	B40328	On-station evaluation and selection of suitable 64 new rice	NARI Research	B40328	PGK	Charlie	MRC	2022/02/01	2023/08/31

		varieties in PNG	fund		19,990.00	Suruban			
11	B40329	Climate Smart Agriculture opportunities for enhanced food production in PNG	ACIAR	ASEM/2017/026	AUD 624,059	Ruth Baiga	MRC, HRC, IRC	2019/06/01	2024/06/01
12	B40333	In situ Conservation and Utilisation of Sweetpotato ( <i>Ipomoea batatas</i> ) for Climate Smart Agriculture Vulnerable Farmers in Papua New Guinea	ITPGRFA BSF4	LoA/TF/PR-152	PGK 813,120	Jeffrey Waki	MRC	2019/08/12	2024/05/31
13	B40336	Upgrading National Genebanks in the Global System	Biodiversity International	L23ROM161	US\$21, 246	Jeffrey Waki	MRC - Bubia	2023/07/01	2024/12/31
14	B40337	Determination of optimum plant spacing of taro cultivars	NARI Research fund	B40337	PGK 6747	Charlie Suruban	Mrc – Bubia	01/12/23	31/12/24
15	HQ40214	PIP Infrastructure Development Program	PIP	562-3101-1-23399	PGK16,000,000	Thomas Omot	MRC	2023/01/01	2024/12/01
16	HQ40215	Better soil and land information for improving PNG's agricultural production and integrated land use planning - building a revitalised PNGRIS2	ACIAR	SLAM/2019/106	A\$76,907	Mark Tinah	MRC	2023/04/01	2026/08/31
17	K10008	Characterising productivity of village chicken eco-types under free-range semi-intensive management systems in Kerevat, Papua New Guinea	Funded from R4D funds	n/a	K20, 000	Fred Besari	IRC	2023/07/15	2025/07/15
18	K1006	Enhancing private sector- led development of the canarium industry in PNG (Phase II)	ACIAR	FST/2017/038	AUD 856,638	Godfrey Hannet	IRC	2019/12/01	2024/12/01
19	L10024	Evaluation of Promising NERICA rice Lines under Upland and irrigated Environmental Conditions in PNG (Laloki)	EU	FED2016/382-604	PGK 22,618	Philmah Seta-Waken	SRC	2020/05/01	2021/06/30
20	L10025	Assessing the effectiveness of Grow Hariap Foliar Fertilizer (GHFF) in managing crop productivity relative to conventional fertiliser practices.	NARI Research fund	L10025	PGK 35,823.40	Philmah Seta-Waken	SRC & MRC	2021/11/01	2023/11/30
21	L10027	Determination of pro-vitamin (p-VAC) and carotene levels in 20 yellow/orange fleshed banana landraces	Bioversity/Crop Trust	L22ROM198	USD 11,008	Janet Paofa	SRC	2022/01/01	2023/01/01
22	L10031	Raising the profile of breadfruit production in coastal and island food systems in PNG	ITPGRFA BSF	PR-59-S-PNG/2024	PGK 926 271.68	P. Seta-Waken	SRC/ MRC/ IRC	2024/04/10	28/040/09
23	T20325	Seasonal incidence and prevalence of nematode intestinal parasites (IP) on sheep and goat flocks in the highlands of PNG	NARI Research fund	T20325	PGK 14,975.00	Stanley Amben	HARC	2016/10/01	2018/03/31
24	T20330	Investigating the epidemiology and economic impact of	NARI Research	T20330	PGK 35,500	Stanley	HARC	2022/02/01	2024/02/28

		the African Swine Fever (ASF) in Tambul, WHP	fund			Amben			
25	T20331	Strategies to alleviate ascites in broiler chicken production in the high-altitude areas of Papua New Guinea (PNG).	PIP Livestock	T20331	PGK 13,980	J. Ahizo	HARC	2022/03/01	2023/09/01
26	T20332	Assessing the baseline productivity of native chickens from different ecotypes adapted to highlands conditions.	Funded from R4D funds	n/a	K20, 000	Jeremiah Ahizo	HARC	2023/07/15	2025/07/15
27	T20333	Assessing the growth, yield performance and other traits of the promising Wheat cultivars on-station at Tambul and Aiyura research centers	NARI Research fund	T20333	K23,499	Stanley Amben/Jonah Anton/Tonavu Yaubi	HARC/HRC	15/11/23	31/12/24
28	U10013	Optimum switch over time from starter to finisher for two broilers genotypes fed different commercial feeds	NARI Research fund	U10013	PGK 36,633	Elly Solomon	MRC	2022/02/01	2024/08/31
29	U10014	Rearing Black Soldier Fly Larvae (BSFL <i>Hermetia illucens</i> ) as an alternative source of high protein from regenerating organic farm wastes into feed for fish and chickens (Project U10008: Phase 2)	PIP	562-3101-1-22964	PGK 15,280	A. Roberts	MRC	2022/03/01	2023/11/30
30	U10015	Sustainable poultry, aquaculture and goat farming for economic and nutritional well being of rural communities in Morobe and Madang Provinces (PIP R&D Component 2)	PIP	562-3101-1-22964	K5,856,673	Michael Dom	MRC	2021/01/01	2024/12/31

### Annex 3. Expected Results in 2024 from implementation in Result Areas

**Table A3a: Priority 1 - Expected outputs in 2024 against Result Area Priorities in Result Areas 1 and 2**

Result Area/Targeted Output in SIP	Outputs from projects/studies to be delivered in 2023	MOV	Lead Officer or team/ Implementation Centre(s)/Project Code
<b>Result Area 1 – Foresighting and Advocacy</b>			
Relevant databases on research investment, Agriculture Science and Technology Indicators (ASTI) and other information developed and maintained	ASTI Database established and awareness raised with stakeholders on regular data collection	Email communications with stakeholders; database	C. Gwabu, MRC
<b>Result Area 2 – Value Chain Support - Value chain innovations for priority crops and livestock</b>			
Information and technology package on small scale commercial production of root, tuber and banana crops	Recommendations on soil management in SP systems in PNG Highlands released	Scientific and Technical Publications	W. Sirabis/HRC/A10226
	Extension Booklet on options of farm by-products as nutrient source in SP systems		
	Information on economic benefit of the use of locally available fertilisers in vegetables, corn and sweetpotato available		P. Seta-Waken, R. Baiga/SRC, MRC/L10025
	Information on attainable yield for sweetpotato and banana varieties in demand in market places;		Yapo Jeffrey, HRC; Dickson Benny, SRC/to be planned
	Information on best-practice spacing for NARI Taro varieties		C. Suruban, MRC/40337
	Targeted research interventions supporting commercial taro and rice production planned and resourced		MRC and SRC teams
Gaps in availability of guidelines, protocols and systems for production of certified planting material of taro, sweet-	Protocols for Potato Rapid propagation technique available to stakeholders	Technical Report/ Extension Bulletin	W. Maso/HRC/A10227

potato, potato and banana addressed;	Protocols for tissue culture propagation for 3 diploid banana types developed	Technical report/Scientific publication	J. Pilon, G. Rauka, J. Aidaboe/MRC/B40325
	Quality taro planting material SOP	SOP document	J. Waki
	Rapid taro propagation methods assessed for efficiency and cost	Technical publication	J. Waki
Specific innovations in target value chains made available to actors in the value chains as part of scaling process	PT varieties produced and supplied according to demand;	PT production and sales records	NARI TC lab Aiyura (Technical Services)
	Quality Potato plantlets supplied as per agreement		
Result Area 2 – Value Chain Support – Galip value chain			
Commercial viability of business models for galip nut processing improved;	Financial analysis of operating cost at the factory and primary processing to factory gate;	Annual project report	Project partners/IRC/K1006
	Cost of production of nuts and various by-products		
	Options for use of by-products assessed	Technical report	D. Hannet, W. Oli/IRC/K1006
Appropriate business models for micro-enterprises developed and capacity of operators increased;	financial analysis for female smallholders selling galip or from micro-enterprises	Annual report/technical report	Project partners/S.Kapi/IRC/K1006
	Training modules and learning materials appropriate for micro-enterprises and female smallholders for galip production and processing	Learning material	
	Key factors that enable microenterprises and female entrepreneurs to effectively participate in canarium value adding and processing	Annual report/technical report	
Improved production technologies developed (harvesting practices, on-farm processing;	Information and protocol for effective and affordable off-station drying methods and protocols;	Technical reports and publications	D. Hannet/IRC/K1006
	Harvesting system at different scales of operation;		G.Hannet/IRC/K1006
	Information on reproductive biology of trees and implications for tree improvement; development of a cropping calendar		G. Hannet/IRC/K1006
	Information on tree variability		G. Hannet/IRC/1006
Information on management options and strategies for the Galip weevil	Information on Galip Weevil life cycle stages and protocols for in-vitro rearing of weevil;	Technical reports/scientific publications	J. Yombai/IRC/K1006
	Information on natural enemies of GW;		
	Information on population structure and vertical distribution maps of GW in infested trees;		
	Information on origin and dispersal of GW;		
	Information on alternative hosts of the GW;		

Suitable mechanisation options available for different scales of operation;	Information on efficiency, suitability of depulping methods and equipment for on-station and off-station processing;	Technical reports	D & G Hannet/IRC/K1006
Advocacy and Awareness on Galip production	Media articles on areas of production, processing and marketing in print and social media	Copies of articles	W. Mollo, S. Kapi, G. Hannet, D. Hannet/IRC/K1006
<b>Result Area 2 – Value Chain Support – Pork Value Chain</b>			
Effective research collaboration and networks between NARI and NAQIA on animal health & diseases.	Participation and contribution to African Swine Fever Taskforce	Meeting reports and minutes	M. Dom, S. Amben/MRC, HARC
Capacity of selected smallholder farmers on improved production practices and animal Health & welfare management and production increased.	Information available on the impact of ASF in local household of Tambul District and disease areas	Technical Progress reports, Quarter reports	S.Amben, HHRC/T20330
	Maps documenting spatial distribution of ASF in the Mt. Giluwe LLG of Tambul based on epidemiological information		
Value chain mapping and key determinants influencing output across the value chain documented;	Improved understanding of status of the pork value chain and gaps in research (Literature review)	Technical Report/ Publication	S. Amben, M. Dom/HHRC, MRC
Demand & key requirements in production, processing and marketing to support niche markets for pork meat determined;	Information on the most cost-efficient feeding regimes for weaner and for grower-finisher pigs using different commercial feeds and blended diets based on local feeds available	Technical Report/ Publication	M. Dom/MRC/U100010

**Table A3b: Priority 2 - Expected outputs in 2024 against Result Area Priorities in Result Areas 3 – 6**

Result Area/Targeted Output in SIP	Outputs from projects/studies to be delivered in 2024	MOV	Lead Officer or team/ Implementation Centre(s)/Project Code
<b>Result Area 3 – Household resilience – Climate Smart Solutions</b>			
Vulnerability and needs assessment information and maps	Needs of higher risk provinces in relation to preparedness to cope with climate induced stresses established;	Technical Report/ Publication	J. Pakatul, S. Amben, P. Seta-Waken, R.Baiga/HRC, HHRC, SRC, MRC/A10228
Diversified climate resilient portfolios of crop varieties and species as well as livestock strategies and technologies adapted to climate risks available to stakeholders	Information on promising NERICA rice varieties;	Technical report/ Publication	P. Seta-Waken/SRC/L10024
	Information on use of BSFL as low cost protein source to supplement diets in village chicken	Technical report/ Publication	A.Roberts/MRC/U10014

holders;	Improved wheat varieties identified for farmer assessment	Technical report	J. Anton, S. Amben, HARC/T20333
	Land management Information Guides	Technical publication	J. Pakatul/HRC/PIP A10228
Relevant farm practices and strategies from production to marketing (e.g. soil fertility and moisture management, storage, on-farm processing, use of seasonal farm advisory) to mitigate risks to household resilience developed and adapted;	Crop calendars documented for selected areas in the country	Technical Publication	R. Baiga/MRC B40329; J. Waki/MRC/B40331; /MRC/B40333, J. Pakatul/HRC/PIP;
	Key crop advisories for NWS seasonal climate forecasts	Technical report/Publication	R. Baiga/MRC/B40329
Scaling approaches applied for wider awareness and adoption on use of climate smart innovations in target areas;	Capacity of extension agents in vulnerable districts in climate smart use of agriculture production technologies and practices built;	Technical and Training reports	J. Pakatul,J.Laraki/HRC,HQ/ (PIP, A10228)
<b>Result Area 3 – Household resilience – Disaster Response</b>			
Sufficient quality planting material and breeding stock available as foundation material for rehabilitation after disaster events;	Key agricultural rehabilitation crops identified and processes in place for deployment in disaster situations;	Technical Bulletin	J. Pakatul,P. Seta-Waken/ R.Baiga/HRC,SRC,MRC (PIP, A10228)
		Quarterly and Annual reports	
Weather data available from all NARI Centres to stakeholders	Weather data captured from the AWS at all Centres and captured in central database	Data base records	E. Kupe, Centre Managers
	National Climate forecast information sharing platform;	Web record / Technical report	R. Baiga,E.Kupe/ MRC,HQ/B40329
<b>Result Area 4 – Agro-ecosystem resilience</b>			
No outputs planned for 2024			
<b>Result Area 5 – Biosecurity – Management of Biosecurity Threats</b>			
Fall Army Worm Management Package and associated information available and capacity built for use by different stakeholders;	Information on FAW baseline sensitivity for pesticides used in control and efficacy under lab conditions;	Technical report/Publication	R. Geno/HRC/A10225
	Information on presence and identity of FAW natural enemies in selected areas in PNG	Technical Report/Publication	
Additional environmentally safe options available to vegetable producers for effective management of Diamond-back moth;	Information on Diamond Back moth baseline sensitivity for novel insecticides (BT and others) and information on efficacy of two best performing insecticides;	Technical Report/Publication	R. Geno/HRC/A10225
Improved understanding of the biology, population dynamics and management options of the Galip Weevil;	See RA 2 Galip Value Chain		J. Yombai/IRC/K1006
Effective management strategies of Ba-	Information on spread of BWAP in the Markham Valley;	Technical reports/	G. Rauka/MRC/B40323

nana-associated phytoplasma in affected areas in Morobe and Madang;	Information on vectors involved with transmission of BWAP in the Markham Valley	scientific publications	
Relevant information on other pest and disease management issues	Management strategies for ascites in broiler chicken in the Highlands of PNG	Technical Report	J. Ahizo/HHRC/T20331
<b>Result Area 5 – Biosecurity – Biosecurity Preparedness</b>			
Contribution to data bases developed for pest alert and incursion threats by NAQIA for stakeholder advise and planning.	Specimen in the NAIC maintained and 500 specimen digitised in an electronic database;	Quarterly and Annual report	NAIC Curator/Technical Services
	Access to CABI PlantWise on-line resources integrated in NARI online resources		L. Fooks/
Pest & Disease diagnostic capacity increased in supporting the sector;	Plant Doctor training conducted for NARI and other NARS staff and applied in pilot Plant Clinics	Progress reports	G. Rauka, R. Geno,/CABI support
<b>Result Area 6 – Genetic Resources – Genetic Resources Management</b>			
A pilot in-situ conservation approach to sweetpotato genetic resources is tested in four districts;	<i>In-situ</i> conservation training manual developed;	Manual document; Training report; Technical progress report to donor	J. Waki, J. Paofa/SRC/B40333
	<i>In-situ</i> conservation training conducted in 4 communities;		
Sweetpotato cultivars characterised, phenotyped, evaluated, documented, pre-bred for traits of importance to adaptation and resilience;	Sweetpotato cultivars in national collections characterised and phenotyped;	Database records (NARI)	J. Paofa, B. Wera,MRC, SRC/B40333
			B. Wera, A10232
Information on GRFA is available to stakeholders in PNG and international community;	Sweetpotato PGR information captured in a local database and kept current capturing all PGR kept in ex-situ collections at NARI stations;	Data base records; Genesys/GLIS records; Annual report; Progress report to donor	J. Paofa, E.Kupe, SRC,HQ/B40333
	Information on sweetpotato accessions held in NARI <i>ex-situ</i> databased incl new breeding lines assigned DOIs from upload into Genesys/GLIS;		
	Fact sheets on poultry breeds kept at NARI	Publication	F. Besari, IRC; J. Ahizo, HARC/K1008, T20332
	Information on morphological descriptors and characterisation data available for current taro, yam, cassava, aibika collections	PGR database records	J. Waki, MRC, J. Paofa, SRC, B. Wera, HRC/B40336
	GRIN-Global PGR information system installed and operating in NARI	PGR database records	J. Waki, MRC, J. Paofa, SRC, B. Wera, HRC/B40336
New PGR collections established and current collections expanded	New accessions for taro, yam and winged bean collected from Madang, Simbu, WHP, Jiwaka	PGR database records	J. Waki, MRC, J. Paofa, SRC, B. Wera, HRC/B40336

	Breadfruit collection expanded and characterisation data established		P. Seta-Waken, J. Paofa, J. Waki/SRC, MRC, IRC/L10031
	Kava genetic resources collected and chemically characterised		TBA
Germplasm of root and tuber crops, fruits and nuts, rice, wheat, maize, OP vegetable seed, spices maintained for further research and development purposes with minimum losses;	All PGR collections in NARI are documented with basic passport data and other pre-breeding information as available;	Records in the database; field maps and plan	J. Paofa, A. Galus, B. Wera, C. Walter, J. Anton/all centres
	all PGR collections are numbered with respective accessions numbers in the field and field plans available;		
	Seeds of 550-600 SP accessions stored at Svalbard Vault;		B. Wera, A10232
Breeding stock of village chicken, cross-breeds, ducks, goats and pigs maintained at NARI centres;	Data base of livestock GR set up;	Data base records	E. Solomon; F. Besari, L. Lapauve, S. Sangi, S. Amben/SRC, IRC, MRC, HHRC
	Chicken and duck breeds characterised;		
Management of international GRFA Agreements and conventions (ITPGRFA and CPGR FAO)	Annual report on status of PGR collections in PNG submitted to CPGR FAO against SDG indicators;	Compliance reports; meeting minutes; SMTA records	Director General, B. Komolong, J. Paofa; L. Fooks, J. Waki, B. Wera
	SMTAs signed for supply of PGRFA to external collaborators;		
	PNG representation in regional and international PGRFA working groups and networks;		
	Dialogue established with CEPA, DAL and other stakeholders on management of international agreements and treaties through domestic policies and legislation;		
	Stakeholder Consultations for Seed policy development facilitated and relevant information and contributions made to NDAL	Draft Seed policy	Director General, Program Directors, staff and stakeholders
<b>Result Area 6 – Genetic Resources – Genetic Resources Use and Access</b>			
Locally adapted sweetpotato varieties (early maturing, drought tolerant, purple and orange fleshed) bred with farmers' participation;	Farmer preferred SP landraces from the NARI SP collections	Technical reports; Quarterly and Annual reports; Technical Progress reports to donor	J. Waki, B. Wera, J. Paofa/MRC, HRC, SRC/B40333
	Workshops conducted in 4 sites and shared learning on breeding of sweetpotato using polycross;		
	C1 evaluation at MRC and HRC completed;		
Seed systems enhanced to promote adapted sweetpotato varieties and other crops;	New sweetpotato varieties introduced to target communities;	Technical reports;	J. Waki, B. Wera, J. Paofa/MRC, HRC, SRC/B40333
	Increased knowledge on quality planting material of sweetpotato by target communities;		
Improved rice and corn varieties released;	64 introduced rice varieties assessed and most promising accessions identified for on-farm trials;	Technical report; quarterly and Annual Report	C. Suruban/MRC/B402328

Standard operating procedures operating in all NARI centres for production of foundation crop planting materials and breeding stock;	Standard operating procedures for PGR collection maintenance and seed production	SOP document;	J. Waki, MRC, J. Paofa, SRC B. Wera, HRC/ B40336
Facilities, equipment and infrastructure in place for production and post harvest processing and safe storage of seed and planting material at NARI centres	Multipurpose shed incl seed processing set up at MRC	Photo records, quarterly and annual reports;	T. Omot, L. Fooks,/MRC/HQ40214
	Facilities at NARI MRC and SRC upgraded with irrigation facilities (all centres), screenhouses (HRC, HARC, IRC)	Photo records, quarterly and annual reports	T. Omot/HQ42014
	Seed handling system at HARC, HRC, MRC SRC IRC	SOPs	L. Fooks, A.Beko, S. Amben, J. Pakatul, R.Miti , N.Bokame/ A10230
Established nurseries and bud-wood trees for new introductions and domesticated fruit and nut crops with commercial potential.	Priority fruit and nut trees for supply to stakeholders identified and sources of planting material supply identified	Study report	TBA/PIP R&D
	Nursery infrastructure established or improved	Photo records, quarterly and annual reports	T. Omot and CMs/HQ42014
Facilities, equipment and infrastructure in place for improved supply of poultry breeding stock at NARI Centres;	2 breeding sheds and hatchery set up at MRC	Photo records, quarterly and annual reports	T. Omot, J. Maima/MRC/U10015
	Equipment for Centre hatcheries SRC, IRC, MRC, HARC hatchery capacity – incubators, power backup		T. Omot/HQ42014
Stakeholders access to and supply with quality breeding stock and planting material of priority crops and varieties improved;	NARI internal system developed to capture production and distribution of breeding stock and planting material and baseline established	Production and Distribution records;	J. Maima, T. Pewa, R. Miti, K. Kobila, N. Bokame
	Online portal for ordering planting material, breeding stock, and information resources;	Online portal accessible	L. Fooks, E. Kupe

**Table A3c: Priority 3 - Expected outputs in 2024 against Result Area Priorities in Result Area 7**

Result Area/Targeted Output in SIP	Outputs from projects/studies to be delivered in 2023	MOV	Lead Officer or team/ Implementation Centre(s)/Project Code
<b>Result Area 7 – Nutritious Food and Health – Improved Diets</b>			
Improved capacity of households to practice sustainable village poultry farming and other appropriate livestock systems in target communities and districts;	RDO and poultry production unit operators in target sites skilled to operate rural hatcheries	Annual and Quarterly reports, Workshop reports,	M. Dom and team/MRC/U10015
	RDOs in target sites skilled in delivery of poultry production training;		
	Rural hatchery units upgraded and operational in target districts		
Enhanced active involvement in households and community on equitable use and consumption of livestock and fish products from village poultry or other livestock/aquaculture systems;	Family Teams in 2 target sites in Momase formed and supported with building social and economic development skills and awareness on balanced diets	Workshop reports	M. Dom and team/MRC/U10015
	On-farm participatory research interventions in place enhancing technology transfer and adoption of improved livestock management practices in 2x target sites	Study proposal	M. Dom and team/MRC/U10015
<b>Result Area 7 – Nutritious Food and Health – Advocacy on safe and nutritious food</b>			
Information materials produced and disseminated on nutritional properties of crop and livestock products	Information materials developed	Flyer, brochures, posters	M. Dom, M. Simin, L. Gam, MRC/U10015

**Table A3d: Expected outputs in 2024 in Cross-cutting Areas**

Result Area/Targeted Output in SIP	Outputs from projects/studies to be delivered in 2024	MOV	Lead Officer or team/ Implementation Centre(s)/Project Code
<b>Cross-cutting Areas</b>			
<b>2.4.1 Scaling of outcomes and impacts of R4D innovations</b>			
Inclusive and equitable partnership models and improved institutional arrangements for scaling of research outputs and providing sustainable support to target value chains, vulnerable communities and other target beneficiaries;			

Operational provincial didiman centres with selected provinces for climate change adaptation support		Quarterly and Annual Reports	J. Pakatul, S. Amben, P.Seta-Waken, J. Laraki /HRC, HARC, SRC, MRC/A10230
Documented models for mechanisation of agricultural SMEs from research and partnerships	Suitable small scale farm machinery identified and sourced		L. Fooks/HQ/PIP R&D
	Pilot hubs established in 2 sites and resourced		TBA/PIP R&D
	Machine operators trained in use of rice equipment		A. Beko/MRC/PIP R&D
Empowering potential for local fabrication of small machines	Local fabrication options identified		HQ/PIP R&D
Research outcomes and impacts assessed and key drivers of success determined;	Approach for Assessment developed	Document	Rose Sabub, Directors
Technical feasibility and commercial viability of research outputs determined;	Commercial viability of business models for galip nut processing improved;	See specific outputs in Table 1, Galip Value Chain	G. Hannet, Australian Partners/IRC/ K1006
	Key scaling factors for taro and rice commercialisation identified and actioned on	Technical Publication	Socio-economic team
Systems and processes in place for up-scaling of supply of planting material and breeding stock;	Provincial administration and relevant stakeholders are engaged to manage and promote sustainable farming of village poultry, fish and goats at households in selected communities;	Project progress reports; Annual Report; Meeting minutes; Consultancy report	M. Dom/MRC/U10015
	Provincial administration and relevant stakeholders are engaged to support resilient farming in selected higher risk provinces		J. Pakatul/HRC, S. Amben/HHRC/ A10230, A10228
	Information on Key factors improving sustainability of breeding stock supply centres at provincial/district level		M. Dom/MRC/U10015
Innovative learning approaches and activities in knowledge transfer and information access to reach rural communities in ADDs developed and applied;	Mobile app for information dissemination developed and launched;		J. Laraki, E. Kupe
	TOT modules incl suit of learning materials fully developed for 5 modules		J. Laraki and other scientific and technical staff/B40331, A10230
Events organised enabling exchange and sharing of insights into lessons learnt from R4D interventions among stakeholders and policy makers;	Annual Innovation Show 2024	Photos, media reports	J. Laraki, L. Fooks, HQ
	Participation in regional shows and exhibitions (Goroka Show, Morobe Show, World Food Day etc.)		NARI Centres
Stakeholders supported with efficient and affordable diagnostic and analytical	Increase numbers of sample submission and analysis compared to previous year (2023)	Laboratory records; quarterly and An-	M. Oromu, J. Kerage/Chemlab

services;	Reduction in chemical analysis sample turnover time compared to the previous year (2023)	Annual reports	
	Capability of the lab increased with testing capacity for EtO and Vanillin established		
	Tissue Culture potato delivery targets met	Annual and Quarterly Reports	W.Maso/TC – Technical Services
	Digital database of agriculturally important insects in the NAIC established and physical records digitised as per work-plan targets		G. Rauka, A. Agia/NAIC/PIP R&D
<b>2.4.2 Gender, Youth and Social Inclusion</b>			
Information access takes into account education and literacy (basic and technical literacy such as use of ICT) as well as a client friendly design of NARI’s infrastructure.	Examples of learning materials for farmer level learning are suitable for learning by groups with low literacy	Documents	All NARI technical and scientific staff
Assessments on the specific needs of gender, youth and other vulnerable groups are incorporated in the design of projects and programs	Gender analysis data captured from survey reports	Technical reports, project reports	Rose Sabub, Staff involved with survey data analysis and reporting/ B40332, A10228, A10230, U10015
R4D programs are tailored to capture the interest of young people in the rural areas using approaches in capacity building and communication appropriate for the targeted age groups;	Youth of both gender feature in target population	Evidence from current project portfolio	Project leaders
<b>2.4.3 Communication for Change</b>			
Communication Strategy	Draft strategy developed	Document	J. Laraki
GIS databases and applications	Updated ADD GIS	ADD maps	M.Tinah, Research staff
	Revitalised PNGRIS2 delivers to users.	Progress reports	M. Tinah, HQ, W. Sirabis, HRC/B40215
Scientific, technical and general information accessible from on-line and other media platforms;	Increased number of records available through Online platform to the information database	Records available through platform	E.Kupe, I.Okpul/HQ PIP R&D
	Ongoing updating and increased access of stakeholders to records in the National Agricultural Information System;	Database records	I. Okpul, E.Kupe/HQ/PIP R&D
	Increased networking and contributions from NARS partners to the Information Database	Database records/ trip reports, workshop reports	I. Okpul/HQ PIP R&D
Internal Information system with on-line databases on research management, Finance, HT and Assets management	HT leave management system database operating;	Reports from the database	E.Kupe, B.Samor
	Functions in the Research management database expanded to online reporting system;		

	Assets Management database operating;		
	Trip and activity report database		

**Table A3e: Expected outputs in Result Areas addressing Institutional Efficiency and Effectiveness**

Result Area/Targeted Output in SIP	Milestones in addressing critical areas in Institutional Management and Development	MOV	Lead officer/team
3.1 Results-based Management			
Annual reporting	Annual report 2024	Documents, Council minutes	Directors, FC, MAP, HRM
Annual Corporate Implementation Plan	Annual Corporate Implementation Plan 2025 endorsed by Council in the last meeting;	Council minutes	Directors, FC, HRM, MAP
Institute M&E system – Stage I Basic capacity for M&E at project level	Capacity building module for basic project M&E for NARI staff developed	Documents	R. Sabub
3.2 Resourcing the Institute			
3.2.1 Advocacy and Visibility			
Avenues for increased level of advocacy and dialogue at policy level created	Advocacy, partners and policy related networking strategy;	Draft Strategy Document	Director level/DG office
	Public Relation Officer established		
NARI achievements presented in diverse media and its profile raised	Media articles (Radio, TV, Newspaper, );	Quarterly and Annual Reports	PR office/Info team
	Video clips; Social media posts; Press releases reporting on NARI key activities		
	NARI Overview Video revised		
3.2.2 Diversifying Funding Sources			
Annual cash flow plans for internal revenue activities completed and implemented	Annual revenue targets met as per Business plan	Document	Centre Managers
Chemistry laboratory Business plan developed	Business Plan developed that shows increasing level of cost coverage / decreasing operational subsidy by NARI recurrent funding	Document	M. Oromu/Chemlab/Technical Services

NARI centre management structure and systems adjusted for improved delivery on assigned functions including revenue generation	Restructuring plan submitted to Council	Council minutes	HR Manager, Directors, DG office
Active engagement with GoPNG and donors result in annual award of diverse research for development grants and funding support	new proposals submitted to donors	Proposal documents	Directors, Scientists..
	engagement with ACIAR and DFAT for new project(s)		
3.2.3 Investing in Human Talents			
Human Talent Management and Development Strategy (HTMDS) developed	Restructuring plan approved by SCMC and requirements incorporated in 2025 Budget submission	relevant council sub-missions;	Director General, HRM, Directors
	Review and revisions to position designations, career path progression completed and submitted to Council for endorsement;	submissions to DPM and SCMC	
	Training plan established and implemented for NARI staff in all categories;		HRM, Directors
Performance based Appraisal system operating	Staff Annual Workplans submitted through rank and file by set deadlines;	Workplan records	HRM, all staff
	Annual PDR review time table implemented	PDR records	
On-line HT Management system operating	Leave management system operating	Leave records	HRM, E. Kupe
Cadetship Program operating	Cadetship Program fully scoped with resource requirements;	Program Documents	Director General, HRM, Directors; MAP
	Administrative processes and learning materials in place;	Manuals, formats, Management policies	
	Key infrastructure development plans in place and construction in progress	Drawings, Plans, Progress reports	
3.2.4 Management of financial and material resources			
Finance management system in NARI improved with online access to reporting and project management information	New Accounting Software operational across NARI Centres;	Progress reports	A,Amoi, C. Mathew,
Medium-term assets and facility management and development plan developed and annual targets met	Online fixed assets management register	Reports, Meeting minutes, maps,	T. Omot, J. Gagau, E. Kupe
	NARI land use mapping and zoning plan developed		T. Omot, M. Tinah, Centre Managers
	Field research area mapped, demarcated and land use history database developed in all Regional Centres		Centre Managers, T. Omot, M. Tinah
	Infrastructure Development Strategy and Implementation Plan for NARI Centres developed and implemented		T. Omot, Centre Managers

Housing estate management policy and strategy developed for NARI establishments	Policy document developed and submission made for Council endorsement	Council minutes	T. Omot, Centre Managers, HRM
NARI land resources secured with title and ownership ascertained	6 portions of land at HRC to get titles and secure	Land title document, Council minutes	T. Omot, M. Tinah, Centre Managers
Key Infrastructure improvements	3 new Staff houses completed in MRC and SRC and substantial R&M at IRC completed	Photos, M&E reports	T. Omot, Property and Centre Managers
	Multipurpose buildings at MRC completed		
	Laboratory infrastructure at SRC upgraded		
	Rice Research Infrastructure development plan for SRC completed and resourced;		
	other key Research Infrastructure activities as per PIP 2024 plan completed;		
3.3 Governance, Policies, Processes			
Revised Organisational Structure at corporate level and regional centres in place	Restructuring plan implemented	Council minutes	DG office, HRM, Directors, S. Tobel
HT Management policies updated or developed	All current policies updated		HRM, Directors, S. Tobel
	Occupational Health and Safety Policy developed		
Financial Management and procurement policies and processes updated	Financial Management standard updated and submitted for endorsement by Council	Council minutes	FC, Directors, S. Tobel
ICT management policy developed	Policy developed and submitted to Council for endorsement	Council minutes	Directors, S. Tobel



The **National Agriculture Research Institute (NARI)** was established by an *Act of the National Parliament of Papua New Guinea (PNG)* in July 1996 as a public funded, statutory research organisation to conduct and foster applied and adaptive research into:

- I. any branch of biological, physical and natural sciences related to agriculture;
- II. cultural and socio-economic aspects of the agricultural sector, especially of the smallholder agriculture; and
- III. matters relating to rural development and of relevance to Papua New Guinea.

NARI is responsible for providing technical, analytical, diagnostic and advisory services and up-to-date information to the agriculture sector in PNG.

The Institute's purpose (strategic objective) is to accomplish enhanced productivity, efficiency, stability and sustainability of the smallholder agriculture sector in the country so as to contribute to the improved welfare of rural families and communities who depend wholly or partly on agriculture for their livelihoods. This is intended to be accomplished through NARI's mission of promoting innovative agricultural development in Papua New Guinea through scientific research, knowledge creation and information exchange.

In its vision for PNG, NARI sees ***“Prosperous PNG Agricultural Communities”***.

### **NARI Logo**

The letters NARI are the initials of the National Agricultural Research Institute. The PEOPLE symbolise those included in the mandate of NARI such as farmers, researchers, extension agents, partners, NGOs etc., backed with **BLUE** to encompass the sky and the macro environment. The LEAF symbolises crops, backed with **GREEN** to depict the crop environment. The PIG and CHICKEN heads symbolise livestock. The **RED** background portrays the toil and sweat of the people.



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