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Final report

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prepared by	Dr Pryor Placino, Prof Katherine Gibson Dr Justin See, Dr Steph Houghton, Prof Katharine McKinnon
co-authors/ contributors/ collaborators	
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2 Executive summary

Our research responds to the need for a different approach to improving agricultural livelihoods in Western Province and is intended to guide an alternative approach to development – one that emphasises assets rather than needs. The research consisted of one integrated scoping study broken down into two small research projects: **FIS/2021/122** which aimed to better understanding what people in the Western Province currently *do* in relation to economic activity and market engagement; and, **FIS/2021/113** which aimed to identify locally appropriate livelihood development practices for the agricultural development sector working across the different regions of Western Province. These projects were commissioned by ACIAR and DFAT to inform future programming in Western Province of Papua New Guinea. Both were undertaken with close collaboration and data sharing across the two teams.

Commencing during the travel restrictions of the Covid-19 pandemic, the projects were designed as desktop studies. The findings rest upon a comprehensive literature review of the last decade's research and development programs in Western Province, discussions with our Stakeholder Reference Group, and 41 interviews with 37 expert informants. Respondents provided valuable reflections on their programmatic experiences, sharing success and failure stories along with insights into Western Province's various assets and strengths.

The aims of FIS/2021/122 were to: Review the existing documented social science and ecological knowledge base about Western Province; Identify the conceptual and geographical contributions and gaps in this knowledge base using a strengths-based, place-based and gender-sensitive perspective; Gather insights from key individuals with place-specific knowledge of Western Province (including South Fly District) about local strengths and assets; and, Identify research priorities for strengthening various agricultural livelihoods and building resilience across the different ecological zones of Western Province.

Findings from FIS/2021/122 revealed that Western Province has significant and largely underappreciated assets and strengths across socio-cultural, economy and ecological systems. These include artisanal agriculture and fishing and associated resource governance and Indigenous exchange practices that underpin livelihoods and have long provided food security across the province. In particular, sago is a reliable wild and semi-cultivated food source and plays an important role in local social and ecological relations. The project also shows 7 unique ecosystems in Western Province that have been shaped by different physical systems, diverse economies and production cultures, historical factors and accessibility, as well as the movement of people across the region. These ecosystems are: 1) province-wide sago ecosystem; 2) drought-affected remote South Fly ecosystem; 3) flood-affected Middle Fly and lowland North Fly ecosystem; 4) coastal and fishing ecosystems; 5) Fly River corridor ecosystem; 6) mining and hinterland ecosystem; and 7) the future P'nyang gas corridor ecosystem. Few existing programs have sought to document and build upon the socio-cultural, economic and ecological specificity of the places in which interventions are taking place.

To successfully strengthen agricultural resilience in Western Province, future programs must improve program design by by addressing the place-based specificities of Western Province and harnessing community strengths and assets. To achieve this, we recommend: place-specific programming that engages with artisanal and subsistence food production to underpin local livelihoods, food security and climate change resilience; A Province-wide research-for-development strategy should address the opportunities and challenges presented by the 7 ecosystems identified in the study; Investments in commercial primary production should be linked with leadership and governance, financial literacy and gender equity training, so that community members ensure benefit is stewarded and distributed equitably.

A pathway forward for Western Province will build on local strengths and assets, including Indigenous agricultural knowledge and practices. It will build understanding of how community members wish to alter existing gender relations and what a local vision of gender equity is. It will engage multiple stakeholders across different sectors in meaningful participation to establish a collective vision for the future, one that is designed and adapted locally, jointly owned, and integrated across silos and jurisdictions. This will ensure that any new approaches arise from local knowledge and priorities, and through processes that are appropriate and meaningful for the local context.

3 Background

Western Province is a complex region with a rich diversity of language and cultural groups, agricultural and livelihood practices, built upon varied physical environments that together create distinctive ecologies each with their own opportunities and challenges. It is also a province that has experienced large-scale environmental and cascading social trauma over the last 30 years.

While there is a substantial body of local knowledge about places, livelihoods, agricultural systems, cultures and development projects in Western Province, no work had yet been done to offer a systematic review of this body of knowledge. This SRA sought to draw out the lessons learnt from decades of research and development work in Western Province by using an assets-oriented, place-based and gender-sensitive lens with which to analyse this wealth of knowledge, experience and expertise across diverse stakeholders.

Across the varied ecologies of the Western Province, there are specific challenges for livelihoods and well-being. Subsistence gardening, fishing and hunting provide a proportion of basic food needs, but there are ongoing challenges to food security, such as mine-related pollution, drought, floods, and increasing climate uncertainty. Transport networks are not joined up, water security is an issue in many areas, communications infrastructure provides patchy coverage and District administrative centres operate in isolation from each other. Many economic development projects have attempted to increase household cash incomes by identifying opportunities for local production for markets (e.g. The Rangers Program, Family Farm Teams (FFT) and Empowering youth and Families (EYF), Sweet potato commercialisation in the Highlands, see Chapter 7 and 8 in the appended report: *'Strengthening Agricultural Resilience in Western Province: A Scoping Study'*). These have met with varied success over the years.

Western Province receives a relatively lower portion of international aid assistance across PNG (i.e., Australian aid through the Department of Foreign Affairs and Trade) (Moran & Curtis-Bibb, 2020). Substantial resources, mainly generated from mining, have been channelled to Western Province through various external organizations, whereby institutions have assumed the role of a 'proxy', substituting for the government in the provision of goods and services (Filer & Jenkins, 2017). An emerging concern with this assistance is that it has been largely following a deficit model, focused on technical assistance to address immediate needs and deficits.

Such investment in external technical assistance has been questioned globally, with concern about dependency from communities who come to rely on external resources (McKnight, 1995), and the desire for a 'quick fix' to address local problems (Green & Goetting, 2010). This can lead to a sense of powerlessness, and often results in solutions that do not sufficiently engage with local residents or develop networks that can sustain these efforts (Boodram, 2019). The PNG Government's Vision 2050 acknowledges as a major challenge the "lack of meaningful participation of the rural people in income-earning activities" and lists as its first desired key outcome "Changing and rehabilitating the mind-set of our people" (Executive Summary).

The scoping study *'Strengthening Agricultural Resilience in Western Province'* was carried out between 2021 and 2023 as an ACIAR small research activity (SRA) and is intended to inform future research and development programming in the region. The SRA was broken into two complementary projects that were conducted in close collaboration:

- ***FIS/2021/122 – Mapping place-based strengths and assets***, led by Professor Katherine Gibson, Institute for Culture and Society, University of Western Sydney,
- ***FIS/2021/113 – Developing methods for strengths-based livelihoods approach***, led by Professor Katharine McKinnon, Centre for Sustainable Communities, University of Canberra.

Together, these SRAs offer an alternative to the needs-based (also referred to as a 'deficit-based') approach of past development projects. Research-for-development is diminished unless the foundational building blocks (strengths and assets of individuals, communities and places) are fully identified as a starting point for thinking collectively about solutions. It is by now widely recognised that Indigenous knowledge and skills are vital to ensure successful agricultural livelihoods development. Recent work for ACIAR by Cargill and Mahalaya, (2017) for example discusses the importance of understanding and building on Indigenous agrarian knowledge and practice, and the effectiveness of an approach that places farmer-to-farmer teaching and learning at the centre. Additionally, there is increasingly wide recognition that Indigenous teaching and learning systems are important conduits for both generating understanding of Indigenous knowledge and skills, and as a platform for more effective communication between research and development personnel and local communities.

Existing knowledge about needs and problems in Western Province is extensive. The economic focus of scoping studies to identify potential interventions relies upon attitudinal and behavioural research (i.e. what people say) at the individual and community level. Rarely are the actual practices of local people (i.e. what people do) documented in order to understand the context into which any new activity must 'fit', let alone the diverse activity profiles of women, men, young, old, able-bodied and disabled. Power dynamics limit what can be found out by asking groups what they would like to see happen. Invariably, the voices of women, the elderly and young people are less heard.

Respect for the depth and diversity of knowledge in Western Province has been undermined by various waves of westernization over the past century, from the impact of missionaries, colonization, extractivist economic projects and aid-oriented development interventions. Younger generations in Western Province are losing access to language and knowledge that has maintained lifeways in this challenging environment over millennia. There is limited understanding of how this loss of cultural knowledge could be halted with, for example, more sensitive and grassroots-led support for indigenous food security. This includes material strengths such as the growing of sago and processing of sago starch as well as immaterial strengths such as the Indigenous knowledge of land, plants, animals, seasons, practices of work and sociality, much of which is codified in stories and myths. It appears that any contemporary accounting of strengths and assets must contend with past processes that have effectively devalued local culture and knowledge.

In Western Province it is especially vital that any intervention is well suited to the particularities of varied local contexts. Drawing on existing research in Western Province, including past ACIAR studies, this SRA documents the diversity of assets and strengths in the region (FIS/2021/122), and reviews how information about local economies has been generating, highlighting the extent to which place-based, strengths-oriented, gender-sensitive approaches have been used in understanding and engaging with agricultural livelihoods (FIS/2021/113).

The combined SRAs are able to recommend development priorities and practices appropriate for the diverse social, cultural, economic and ecological attributes of the region. From this foundational work, aid and development can more effectively support resilience by ensuring that research and development efforts have the means to work within existing community norms and values, build on existing community practices, enable adaptation as new challenges arise (in relation to e.g. climate uncertainty, health crises etc), and allow/encourage community learning, and meet the values and aspirations as defined by the community.

Building resilience will be enhanced by having a broader base of understanding of place-based ecologies with their diverse economic practices (or diverse economies) from which any intervention can start. As signalled in the Australian Government's DFAT Partnerships for Recovery, Australia's COVID19 and the PNG COVID response plan, there is an urgent

need for a more integrated approach to development. The knowledge base produced by this SRA will allow aid investments in the region to better design interventions to build on current economic activity, harnessing current strengths and assets and align developing market systems with traditional social systems, and associated norms and values. This knowledge base will inform ACIAR's initiation of research projects targeting gender-sensitive agricultural improvements that build on the strengths, assets, and varied livelihoods of specific places across the Western Province.

4 Objectives

The primary objective of FIS/2021/122 was to map (conceptually and geographically) the place-based strengths and assets of Western Province, thus producing a knowledge base to inform agricultural development programming strategies.

This SRA aimed to better understand what people in the Western Province currently *do* in relation to economic activity and market engagement. This was achieved by conducting a distinctive 'reading' of the available data that brings to the fore what is known about strengths and assets, and by probing interviews with PNG experts with local knowledge. It contributes to widening the understanding of what PNG communities have to offer the process of locally-led development, including, for example, women's leadership abilities, Indigenous cultural and ecological knowledge and the untapped potential of young people.

The four main objectives of the project were:

1. Review the existing documented social science and ecological knowledge base about Western Province.
2. Identify the conceptual and geographical contributions and gaps in this knowledge base using strengths-based, place-based and gender-sensitive perspective.
3. Gather insights from key individuals with place-specific knowledge of Western Province about local strengths and assets.
4. Identify research priorities for strengthening varied agricultural livelihoods and building resilience across the different ecological zones of Western Province.

5 Methodology

This study was commissioned by ACIAR and DFAT to review research and development activities undertaken in Western Province of Papua New Guinea. Western Province is the largest province in Papua New Guinea by area: it occupies 97,000 square kilometres in the southwest of the country (Hanson et al., 2001). As the largest Province in PNG, Western Province encompasses great regional diversity. It shares borders with two other nation states (Australia and Indonesia) and remains one of the disadvantaged provinces in the nation. It has experienced the devastating impact of large-scale mining, with the legacy of the Ok Tedi mine still affecting livelihoods and entire landscapes both near and far from the site of mineral extraction. The Province occupies a strategic geopolitical location bordering Indonesia to the west and the Torres Strait of Australia to the south.

While focused on Western Province, this research was conducted remotely from Australia. The design of the work recognised the limitations that COVID19 imposed on travel to PNG and the constraints to working directly with communities and local agencies. It also acknowledges the level of consultations done to date in communities and the risk of further imposing on people's time and energy. In light of these concerns, the design sought to make use of the wealth of existing knowledge, both published and held by the people and organisations engaged in the development sector in the region.

The scoping study is thus based on an extensive literature search of academic and grey literature and 41 in-depth interviews conducted online with 37 individual key informants, including scientific experts and lay knowledge holders, both local and international. A database of place-based knowledge about Western Province has been built up by geocoding all information gathered.

This report draws on interviews with key informants who have deep knowledge and experience of the Province. The names and contacts of initial key interviewees were gathered from members of the Stakeholder Reference Group. We also utilized a snowballing approach to gather new contacts by acquiring referrals from the interviewees.

PNG-based research coordinators Baia Warapa and Nancy Wobo provided assistance in locating and interviewing local respondents. Our team in Australia included project lead Professor Katherine Gibson, Institute for Culture and Society, University of Western Sydney (FIS/2021/122); project lead Professor Katharine McKinnon, Centre for Sustainable Communities, University of Canberra (FIS/2021/113); Dr Pryor Placino, University of Western Sydney; Dr Justin See, University of Western Sydney; and Dr Stephanie Houghton, University of Canberra/University of Western Sydney.

A strengths-based approach

The overall approach taken in this study utilised a strengths-based, a gender-sensitive and place-based approach. In FIS/2021/122 – Mapping place-based strengths and assets, this meant taking a close look at the existing strengths and assets of Western Province and considering how they form the foundation of future livelihoods.

A strengths-based approach assumes that communities already possess important knowledge and skills upon which to build (Cameron & Gibson, 2005; Saleebey, 2008; Mathie et al., 2017). The strengths-based approach used in this scoping study is informed by Asset–Based Community Development (ABCD), an approach to working with communities pioneered by Kretzmann and McKnight (1993). The strengths-based approach challenges traditional approaches to community development which assumes that community members "become clients because they have deficits, (and) are, in some essential way, flawed or weak" (Saleebey, 2009, p. 3). In contrast, a strengths-based approach focuses on assets, capabilities, and resources, and in doing so, encourages a proactive role for community members, instead of a passive and dependent role in development practice (Mathie & Cunningham, 2008). The appeal of a strengths-based

approach lies in its premise that people in communities can drive the process of development themselves by identifying (often unrecognized) assets and then mobilizing them to respond to local issues. In PNG a strengths-based approach is particularly important for working against patron-client relationships that often emerge between external agencies and community members.

This approach challenges the common representations of Western Province as a problematic and deficient region. Constructing a detailed inventory of assets particular to villages and the different ecologies of Western Province can provide future programs and projects with the knowledge essential for shaping strengths-based development programs. Shedding light on these strengths and assets should go hand-in-hand with making Indigenous agricultural knowledge and practices more visible. A strengths-based approach can also help address the "patchiness" of the institutional landscape in Western Province in which various development organizations have the tendency to work in silos and undertake their uncoordinated and unsustained plans that have little to show when project money runs out (Moran et al., 2021, p. 7). When these organizations apply a strengths-based approach, they will potentially be able to "bring the resources they have together through partnership in the most productive ways" (Moran et al., 2021, p. 7).

Gender

Both projects investigated the gender dynamics relevant to livelihoods development in Western Province. A gender-sensitive approach to community engagement promotes gender equality and empowerment, as well as respects pre-existing context-specific gender norms (Akondeng et al., 2022). It acknowledges the numerous obstacles to women's involvement and sets up mechanisms to address these obstacles (Gurstein, 1996). In addition, since any development initiative is likely to affect men and women differently given differences in their roles, responsibilities, and constraints faced (Moser, 1993), a gender-sensitive approach tracks changes in gender equality and relations as a result of a particular intervention.

A gender-sensitive approach provides both men and women with equal opportunities to participate in development programs. An important prerequisite for gender-sensitive research and development is the availability of data disaggregated by sex and other types of information reflecting differences between women and men. Hinrichsen et al. (2014, p. 1) assert that only when "gender-relevant aspects are explicitly mentioned in the objectives system and the indicators of the projects… can we ensure that gender equality is adequately taken into account when steering and implementing projects…". It is important to understand existing gender roles because it provides information on the different conditions that women and men face, and the differential impacts that policies and programs have on them. This information is essential in ensuring that research and development programs cater to the needs of women. Equally important is understanding how community members wish to alter existing relations and what a local vision of gender equity is. Making assumptions about what gender equity ought to look like and how it ought to be achieved can result in efforts that are ill suited to community members and fail to achieve results because local women and men do not see the relevance for themselves.

Place-based approaches

Place-based interventions refer to "collaborative, long-term approaches to build thriving communities delivered in a defined geographic location... characterized by partnering and shared design, shared stewardship, and shared accountability for outcomes and impacts" (Osborne et al., 2021, p.2). Bellefontaine and Wisener (2011) contend that place-based interventions have several key characteristics including: engagement of multiple stakeholders across different sectors, designed and adapted locally, shared ownership of the initiative, and attempts to integrate across silos and jurisdictions, among

others. Through meaningful participatory responses, local communities are provided with a framework to identify and respond to local needs and challenges in order to improve well-being in a particular area. Participation is “an active process by which… groups influence the direction and execution of a development project with a view to enhancing their well-being in terms of income, personal growth, self-reliance or other values they cherish” (Paul, 1987, p. 2). Meaningful participation usually involves bringing different stakeholders and community members together to establish a collective vision for the future, and to commit to achieving that specified vision. Thus place-based approaches are those that arise from local knowledge and priorities, and through processes that are appropriate and meaningful for the local context.

In this project, the investigations undertaken by FIS/2021/122 – Mapping place-based strengths and assets, provide the foundation for understanding and engaging with the specificities of place. Such understanding is an essential foundation for any place-based engagements. In FIS/2021/113 – Developing methods for strengths-based livelihoods, the research investigated the extent to which existing development programming in the region was applying a place-based approach, and the existing tools and methods that could support place-based programming in the future.

Further discussion of the methods used is provided in the appended report: *‘Strengthening Agricultural Resilience in Western Province: A Scoping Study’*

6 Achievements against activities and outputs/milestones

6.1 Objective 1: Review the existing knowledge base about factors affecting rural livelihoods in Western Province

The researchers reviewed existing studies that focus on place-based livelihoods and development challenges in the Western Province in PNG. They identified relevant historical and contemporary ethnographies, biogeographies, recent (last 10 years, with some exceptions made for important prior reports) field-based surveys conducted (e.g. by the World Bank, the Reef Rainforest Research Centre and other consultants), and current projects operating at the Ward level (such as the World Bank's Rural Service Delivery project). The review particularly looked for documentation of local strengths, assets, Indigenous and gendered knowledge. These datasets were geocoded and processed using QGIS that led to the production of various maps. The research teams of FiS/2021/122 and FIS/2021/113 met in a series of online meetings to discuss their findings. An Interim Mapping of the different ecologies and diverse economies of Western Province was produced after completing activities 1.1-1.5 below.

No.	Activity	Outputs/ milestones	Completion date	Comments
1.1	Combined SRAs project teams workshop fine-tuned the research design (with FIS/2021/113).		Sept 2021	Held online over a series of Zoom sessions due to Covid restrictions
1.2	Compiled a data base of the existing social science knowledge and geolocated all field studies, noting the date and type of information collected by place		Dec 2021	
1.3	Documented and mapped regional variations of climate and ecological diversity across Western Province.	Various maps	Feb 2022	
1.4	Convened a workshop of GIS specialists (including PNG practitioners) to devise a user-friendly mode of representing the content and coverage of collected data.		Mar 2022	The workshop was replaced by discussions with Stakeholder Reference Groups members. The maps were circulated to them through the Interim report. Some raw data (e.g. list of mapped development and research projects) were included in the Final Report.
1.5	Held a Progress Review Workshop in person in Canberra with FIS/2021/113, and SSS/2018/137		Jul 2022	In person workshop was replaced with a series of online team meetings

1		Interim Mapping of the diverse economies and ecologies of the Western Province	May 2022	Appended to Annual Report 15/05/2022

6.2 Objective 2: Analysis of knowledge base using a strengths-based, place-based and gender-sensitive perspective

The knowledge base compiled by the activities in Objective 1 was critically analysed using a strengths-based, place-based and gender-sensitive approach. The researchers attended to the diversity of place-based and gendered practices of livelihood making and the ecological settings of those livelihoods. Their analysis foregrounded reports of *actual practices* rather than reported perceptions and attitudes, bringing visibility to strengths and assets in the process. They research team asked the members of the Stakeholder Reference Group to identify what they value and what they are proud of in their current situation. This discussion with the group had helped the researchers gain access to multiple viewpoints in communities. After completing activities 2.1-2.4 as enumerated below, the researchers delivered an Interim Knowledge gap report and an Interim 'Synthesis and Recommendations Report' to help inform the DFAT Western Province Partnership Design Plan.

No.	Activity	Outputs/ milestones	Completion date	Comments
2.1	Critically analysed the knowledge base created by Activity 1 from the perspective of a strengths-based approach		Mar 2022	
2.2	Interrogated the various data collection methods from which knowledge is drawn from the perspective of social practice		Mar 2022	
2.3	Identified gaps in the knowledge base drawing on existing theoretical and field-based literature.		Mar 2022	
2.4	Stakeholder Reference Group virtual workshop was held to present and discuss findings (with FIS/2021/122).		Jun 2022	Originally scheduled for April, but delayed due to scheduling conflicts for key members of stakeholder committee.
2		Interim Knowledge gap report	May 2022	Appended to Annual Report 15/05/2022

2b		Interim 'Synthesis and Recommendations Report' to inform the DFAT South Fly Resilience Plan and the Western Province Resilience Plan	May 2022	Appended to Annual Report 15/05/2022

6.3 Objective 3: Access data about place-based strengths and assets

This activity gathered insights from key individuals with place-based knowledge of local strengths and assets in Western Province. Strengths and assets that were identified included elements of the physical, social, cultural, economic and institutional environment, past and present. Experts will be sought from a range of social, natural and applied sciences backgrounds. People with non-expert but deep local knowledge were also interviewed. Development practitioners were also enrolled to reflect on the after-effects of past projects. Historical accounts and contemporary analyses were collected. The timing of these activities, as documented in the table below had to accommodate disruption around the June 2022 PNG General Election. The researchers produced a report that mapped the identified the strengths and assets of Western Province.

No.	Activity	Outputs/ milestones	Completion date	Comments
3.1	Interviewed expert informants		Jul 2022	
3.3	Developed a typology of identified strengths and assets and a mapping tool to represent them		Mar 2022	
3		Mapped what we know of the strengths and assets of Western Province	May 2022	Appended to Annual Report 15/05/2022

6.4 Objective 4: Develop recommendations for a program of research for agricultural resilience across Western Province

This final activity used the results from Activities 1, 2, and 3 and the output of **FIS/2021/113** to identify research priorities for strengthening varied agricultural livelihoods and building resilience across the different ecological zones of Western Province. The researchers also had to do a series of interviews with key informants to gain a deeper outlook of the three themes, namely: sago, gender and NS-CDW, that were identified in the earlier activities of the project. The findings were from Activities 4.1-4.3 were analysed and discussed over a series of online meetings. The researchers also sought feedback on the draft of the Final Report from the Stakeholder Group that was subdivided into 3 smaller groups to better manage schedule and reviews. After completing Activities 4.1-4.4, the researchers submitted a Final SRA Report and recommendations and a Final

'Synthesis and Recommendations Report' to inform the DFAT Western Province Resilience Plan.

No.	Activity	Outputs/ milestones	Completion date	Comments
4.1	Combined SRAs project teams (**FIS/2021/113** & **FIS/2021/122)** workshop to develop specific recommendations for a number of potential ACIAR research projects located in different parts of Western Province		Nov 2023	Held online
4.2	Workshop (virtual) to review findings and discuss research for development priorities with PNG based Community of Development Practice group.		Sep 2023	Replaced with a series of interviews with different informants per key theme: a) sago, b) gender, and c) NS-CDW.
4.3	Prioritizing Recommendations Virtual Workshop with Stakeholder Reference Group to review findings and discuss research for development priorities for a number of potential ACIAR research projects located in different parts of Western Province		Dec 2023	Stakeholder Group was subdivided into 4 smaller groups to better manage scheduling
4.4	Combined SRAs project teams Report Writing Workshop		Dec 2023	Conducted online due to team member illness.
4.a		Final SRA Report and recommendations	Dec 2023	Submitted 22/12/2023
4.b		Final 'Synthesis and Recommendations Report' to inform the DFAT South Fly Resilience Plan and the Western Province Resilience Plan	Dec 2023	'Strengthening Agricultural Resilience in Western Province: A Scoping Study' appended to the SRA Final Report

7 Key results and discussion

Below is a snapshot of the key results and discussions from FIS/2021/122. Detailed outcomes and analysis can be read in Section 2 of the appended report 'Strengthening Agricultural Resilience in Western Province: A Scoping Study'.

7.1 Strengths and Assets of Western Province, PNG

Our study found that the unique strengths and assets of Western Province, including physical, cultural, and economic aspects, are present across the interconnected systems that shape the distinct ecologies in Western Province.

Drawing on Gibson-Graham's diverse economy framework (2006), an expanded understanding of what makes up the economy of Western Province can be made visible. A plurality of noncapitalist and alternative capitalist economic practices can be identified constituting the Province's local economy. The diverse economy of Western Province can be depicted using the metaphor of a floating coconut (see McKinnon et al., 2016). The 'floating coconut' is a way of representing all the different activities that contribute to sustaining livelihoods, both those that are most visible as formal economic activities and those activities in the informal and social economy that are usually given less recognition or attention (Figure 1). All are vital to local livelihoods. Above the waterline are the commonly known economic activities associated with 'development' (e.g., paid labour, capitalist business, market transactions) while the submerged part includes the vast array of activities that also sustain lives (e.g., unpaid labour, non-capitalist enterprises, traditional markets, reciprocal exchanges, communal properties, illegal practices). Many of the economic activities in Western Province can be found in the underwater portion of the coconut.

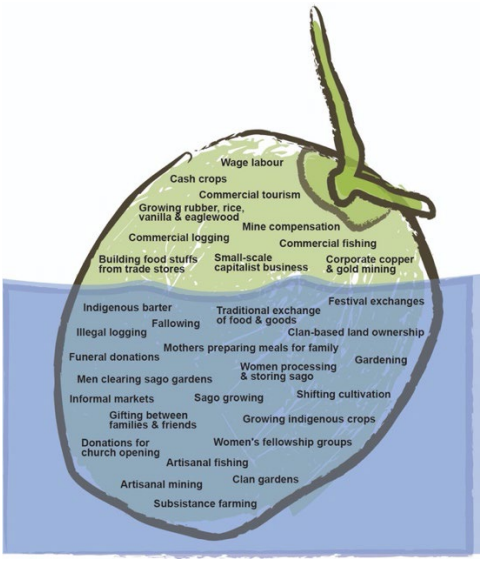


Figure 1 A floating coconut image of Western Province's diverse economy

We identified that the diverse economy of Western Province in based on seven interdependent ecosystems that include: physical systems, socio-cultural systems, diverse economies, geographical mobility and migration, and development interventions.

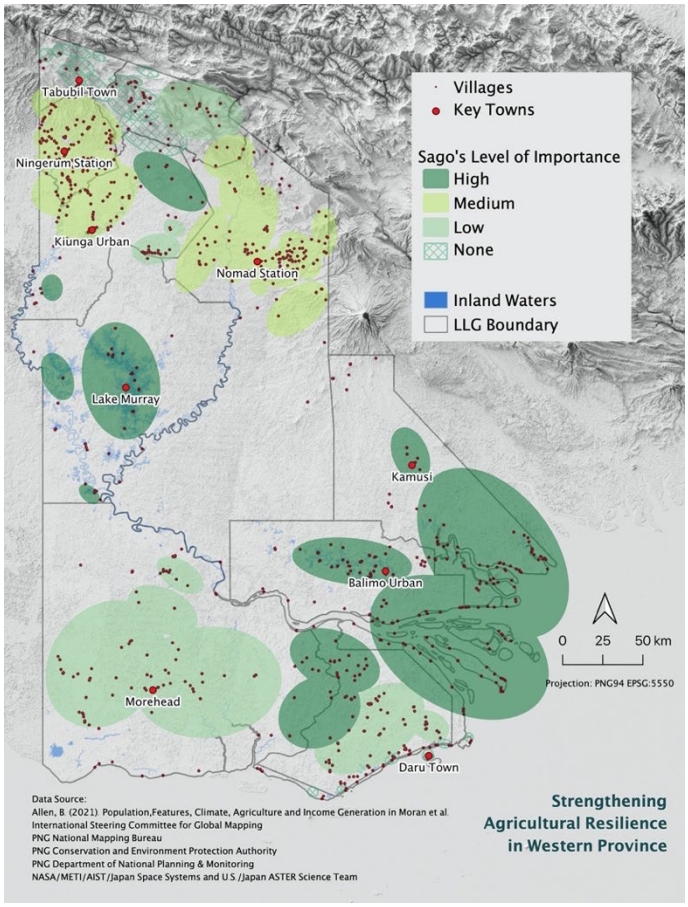
Seven ecosystems of Western Province

1. Province wide sago ecosystem

Sago provides the basis for an indigenous ecology that spans 80% of Western Province. Sago is resilient to climate change and provides a food safety net that underpins livelihoods across all the lowlands of the Province. Sago is connected to a relational way of life that has supported people in Western Province for centuries and is a major asset to be valued.

Presently, sago is an under-recognized cultural and economic asset. Women are responsible for cutting the sago palms, processing the sago and cooking it. Celebrating sago production and its role is a way of valuing empowering women's work. Mitigating the impacts of climate change on sago can also help alleviate the burden put on women's sago-related livelihood activities. As the risks of food contamination appear to be on the rise (Seymour, 2021) there is an urgent need for investment in awareness and research into safe storage and preparation.

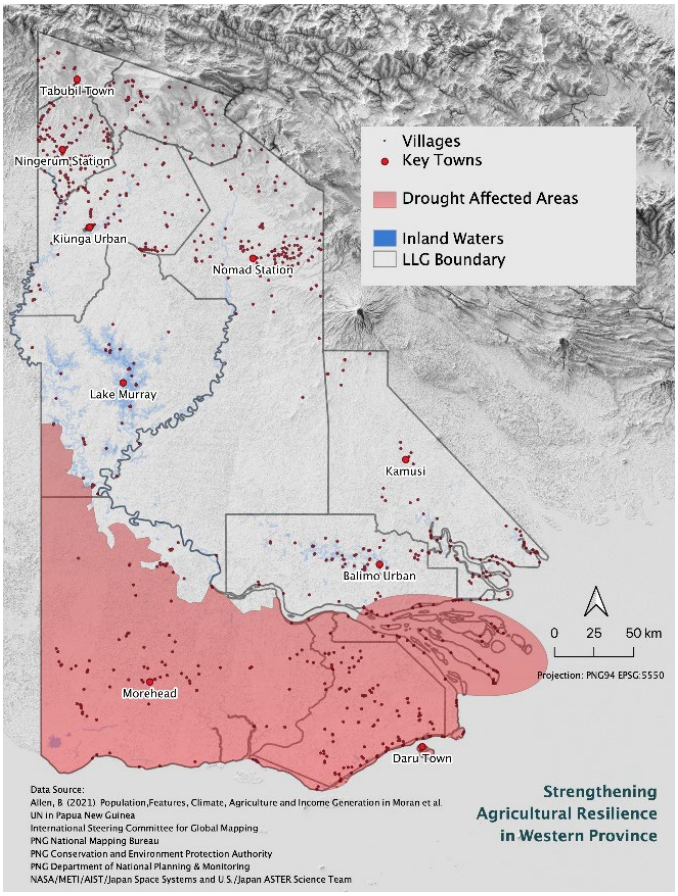
Safeguarding the sago safety net links to safety of water resources, environmental repair of drainage ditches and health awareness. Investing in a Province wide sago resilience strategy would provide motivation and rationale for linked resilience strategies focused on WASH, addressing mine waste, healthy eating, food safety and women's empowerment.



Map 1 Province wide sago ecosystem

2. Drought-affected remote South Fly ecosystem

This ecosystem located south of the Fly River is dominated by severe rainfall deficit. It includes remote areas with high cultural diversity, intact traditional agriculture, semi-adequate food security, but facing the challenges of declining soil fertility, pests and disease, more frequent droughts, limited connectivity, and lack of access to cash to pay for basic public services. Sago and yam are the main food staples in the west (Morehead Rural) of this area, sago and banana/taro/yam/coconut are the main staples in the east (Oriomo-Bituri Rural) and sago and coconut areas north-eastern Kiwai Rural. Increased incidence of drought poses threat to these indigenous crops. Development investment to date has been limited in these areas. Villages in this ecosystem have been recently visited by the SFRP Rangers program Tok Save teams to assess needs and implement actions. This ecosystem also includes areas of high biodiversity protected by Management Agreements where there are opportunities for sensitive eco-tourism.

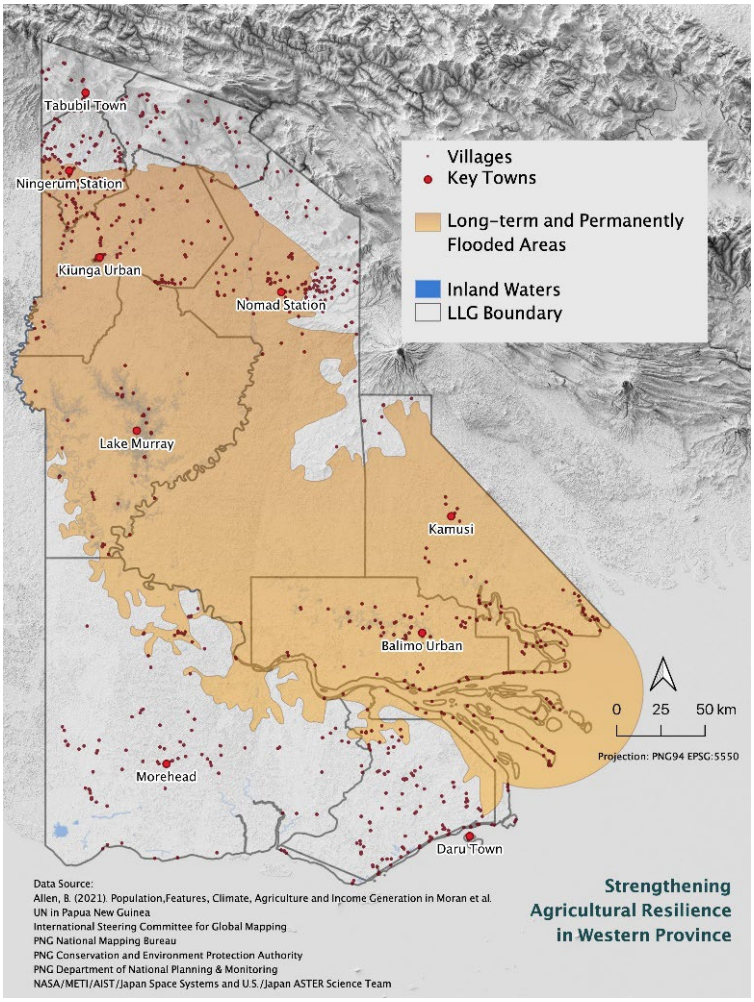


Map 2 Drought affected remote South Fly ecosystem

3. Flood affected Middle Fly and lowland North Fly ecosystem

Middle Fly and lowland North Fly are gravely at risk from permanent and long-term flooding. This hazard poses a problem for local gardens devoted to growing indigenous crop such as sago and banana associated areas of Nomad Rural, sago areas of Lake Murray Rural**,** sago and coconut areas of Gogodala Rural, Bamu Rural and north-eastern parts of Kiwai Rural and sago and banana areas of Kiunga Rural and lower part of Ningerum Rural. This ecosystem includes resettlement areas where refugees have developed new agricultural ventures and taken advantage of marketing opportunities with improvements of the Highway between Nomad and Kiunga. Balimo is a centre of a

cultural tourism that could be supported to develop culturally sensitive sustainable development.

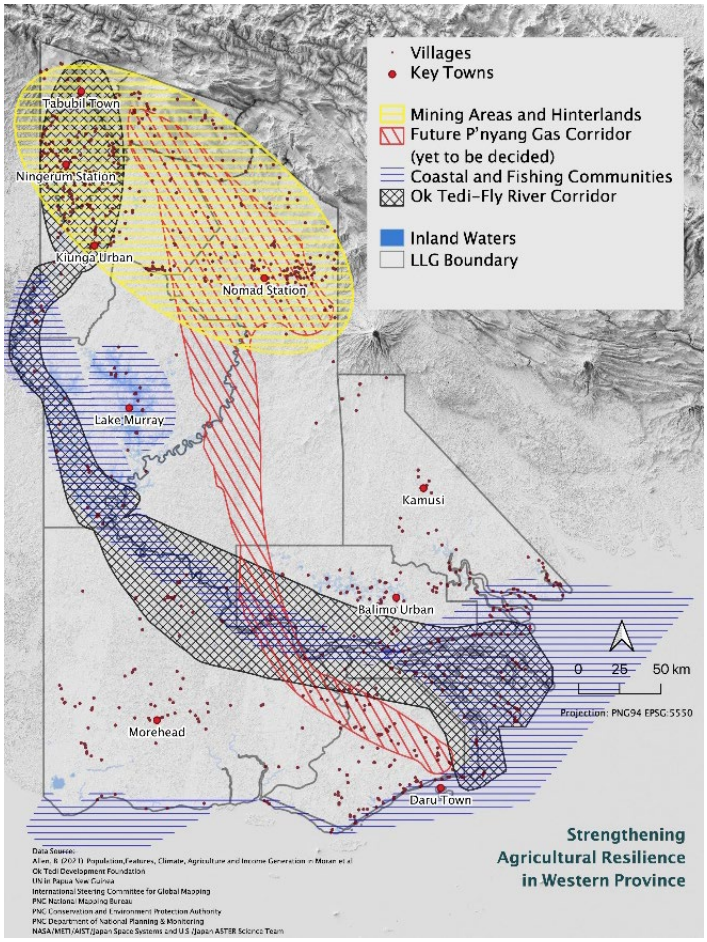


Map 3 Flood Affected Middle Fly and North Fly Ecosystem

4. Fishing and coastal ecosystems

Fishing ecosystems are found largely along the southern coast of the province, including Treaty and non-Treaty villages, but extending across the Fly delta, as well as inland around Lake Murray. Artisanal fishing is a major livelihood along the coast—with western coastal villages mostly in Morehead Rural LLG focusing on freshwater and estuarine catch and eastern communities along the coast of Kiwai Rural LLG on estuarine and saltwater species (Busilacchi, et al., 2014). There have been various attempts to develop commercially oriented fish farming of barramundi in the inland waterways and mud crab farming in the Fly Delta area.

Fishing ecosystems face challenges to livelihoods from flooding, overfishing and illegal fishing, invasive species and habitat destruction causing species decline. These communities experience regular inundation of housing, inadequate water supplies, problems with sanitation and limited connectivity. The effects of sea level rise will render some coastal areas uninhabitable by 2030 and there is an urgent need to prepare for resettlement. These areas have already experienced socio-political tensions relating to in-migration of mine related environmental refugees from Middle and North Fly. They have been a focus of recent development investments by DFAT.



Map 4 Other ecological areas (hatched areas only)

5. Fly River Corridor Ecosystem

This corridor includes the commercial crop growing areas of the Community Mine Continuation Agreement (CMCA) Trust Region where the Ok Tedi Development Foundation has promoted agri-business including rubber, vanilla and eaglewood and alternative livelihood sources, including fishing. These areas bore the brunt of mining related environmental degradation and subsequent out migration and are now a major focus of development investment. Across the Province there is reporting of abandoned rubber trees planted in 1960s that have not been tapped because of the lack of a supply chain. Any commercial crop development must ensure that markets and transportation is available. The support of farmers who are members of North Fly Rubber Cooperative by OTDF will need to be monitored to see that the market chain is maintained. Commercial agriculture is more likely to engage men and increase their access to cash. The gender equity aspects of these projects must be monitored. Women's commitment to ensuring

food security, for example their role in sago production, must continue to be valued alongside any new agricultural developments.

6. Mining and hinterland ecosystem

In the mining areas and hinterlands of North Fly ongoing extraction of minerals brings in-migrants. The downstream portion of upper Fly River along the road to Kiunga has also been host to artisanal and small-scale miners from different parts of North Fly district. Cash earning opportunities from labour and sale of surplus agricultural produce are greater in this area. Money circulates out into a wider hinterland via social and family networks and brings its own impacts on indigenous livelihoods. Future challenges include mine closure, the lack of decommissioning policies and post-mine environmental repair, and land use conflict.

7. Future P'nyang gas corridor ecosystem

The planned P'nyang gas pipeline is currently under negotiation. If the plan pushes through, it will potentially affect areas that span from North Fly district to the South Fly. In particular, sago and banana associated areas of Nomad Rural and sago and coconut areas of Gogodala will be impacted by the proposed P'nyang gas pipeline if the line potentially passes through that area. Also, some parts of sago and banana/taro/yam/coconut areas of Oriomo-Bituri Rural all the way up to Daru will be potentially affected by the planned pipeline project if the line gets set up along that route. The proposed extraction of natural gas in the P'nyang field and along any potential areas where the pipes are to be placed can be expected to change settlement patterns, land use systems, and livelihoods (of both human and nonhuman worlds) in the affected areas.

7.2 Findings

Our findings are presented in the appended report *'Strengthening Agricultural Resilience in Western Province: A Scoping Study'* using a series of maps and related discussions about physical systems, socio-cultural systems, diverse economies, patterns of mobility and migration and development interventions in Western Province. Our approach identified place-based strengths and assets. The synthesis of findings resulted in identification of seven ecological systems, each with their own challenges for development programming.

The scoping study of strengths and assets found that:

- The **physical systems of Western Province** are defined by different topography, soils, climate variability and vegetation cover. The soil types in the low lying (<1000 m) areas of the Western Province are predominantly acrisols and fluvisols. The heavily leached soils and regular flooding of large areas of the province provide challenges for agricultural development that demand place-specific attention. A significant and under recognized asset of WP is the vegetation that has evolved in place that offers food sources uniquely adapted to these challenges. Sago is a widely accessed wild food that is able grow well despite poor soils and regular inundation.
- The **socio-cultural systems of Western Province** are complex and rich. There are currently 62 local languages spoken, These languages are significant but under-recognized assets. Each language contains place-based indigenous ecological knowledge and terminology, as well as a level of grammatical sophistication that is lost in translation to Tok Pisin. Indigenous customs of coping with drought and

flooding are still being practiced but are under-researched. Socio-cultural practices have been significantly changed through contact with external institutions such as aid agencies, NGOs, missionaries, and other governments.

- **Western Province has a diverse economy** in which livelihoods are supported primarily by subsistence agriculture and household production. The wealth of local agricultural know-how supports food security and is one of the Province's main assets. Goods and services are primarily produced for direct consumption by individuals, families and collectives. Surplus product is distributed across the Province via a complex network of exchange including reciprocity, barter and cash. Commercial activities support a small number of people in specific regions of the Province in mining, forestry, agriculture and fishing. Commercial agriculture is mostly found in the Community Mine Continuation Agreement (CMCA) corridor which bore the brunt of mining related environmental degradation and subsequent out migration. Commercial fishing is mainly centred in South Fly.
- The geographical **mobility and migration of people** within and outside their communities in Western Province is affected by different economic, environmental and social circumstances. In rural areas mobility is a key asset used to cope with seasonal water shortages. Across the Province migration has been a strategy used to cope with mine-related disasters and geo-political uncertainty. These dynamic factors have implications for livelihoods and food security, land ownership and land disputes, and cultural maintenance.
- The **development interventions** in the CMCA region have primarily been led by Ok Tedi Development Foundation (OTDF), together with other NGOs and international agencies. Our review indicates that some areas of Western Province have had very little attention from development projects, particularly the sparsely settled areas of Nomad Rural in the north, Bamu Rural and Gogodala Rural in the east and northern Morehead Rural in the south.
- The **sago safety net** is one of the key assets of Western Province. The sago 'way of living' relies on this wild food source that has supported livelihoods in a demanding environment for millennia. The sago palm is exceptionally resilient to drought, floods and climate change and is a life support during hard times.
- **Seven varied ecological systems can be identified** across Western Province that emerge from the interactions of a) physical systems, b) socio-cultural systems, c) diverse economies, d) mobility, displacement and resettlement, and e) development interventions. These ecological areas are 1) Province-wide sago ecosystem, 2) drought-affected remote South Fly ecosystem, 3) flood-affected Middle Fly and lowland North Fly ecosystem, 4) fishing ecosystem, 5) Fly River Corridor ecosystem, 6) mining and hinterland ecosystem, and 7) future P'nyang gas corridor ecosystem.

The critical findings the scoping study include:

- **Limited data on strengths and assets**: our analysis of documentary sources reveal that needs are more prominently featured than assets. For instance, the World Bank's Rural Service Delivery and Local Governance Preparation and Pilot (RSDLGP) Report (2018) enumerated 85 needs as compared to 56 assets. Similarly, Reef and Rainforest Research Centre's (RRRC) Tok Save Roadshow Report (2021) identified 575 needs compared to only 284 assets.

- **Lack of place specificity**: few studies have specifically traced assets and needs from particular villages or districts. For example, Moran et al.'s (2021) Analytical Review Paper on Western Province identified 54 types of needs, 83% of which were identified with the whole Province with only 17% located in specific local-level governments (LLGs). Gaps in place-specific information include:
    - Indigenous trade networks across the Province
    - Areas of most conflict between traditional landowners and new settlers
    - Updated information on Indigenous agriculture (in particular, sago cultivation)
    - Spread of artisanal mining activity
    - Location of failed development and business interventions
    - Location of long-term viable community projects
- **Narrow scope of project locations**: our review indicates that projects and studies have been focusing on select areas and communities only. For instance, ACIAR's project sites mainly cover the North Fly and South Fly alone. From a socio-spatial justice perspective, some work needs to be undertaken in other areas such as in the Balimo, Bamu, and Nomad LLGs in Middle Fly. Scholars describe the Middle Fly as 'seriously disadvantaged' relative to other districts in PNG, and people in the Balimo, Bamu and Nomad LLGs have reportedly received little assistance from the Ok Tedi mine. The Balimo area has also been described as having a 'moderate-to-high land potential' for agricultural development and is reported to be well suited to fibre crops such as the likes of the Acacia species (Hanson et. al., 2001).
- **Little understanding of Indigenous agricultural knowledge**: resources that document Indigenous agricultural knowledges and practices are scattered, limited and say little about the embodied and storied knowledge of elders. The extensive place-based and Indigenous adaptation and experimentation of local communities needs more consideration. A growing body of literature is demonstrating the value and importance of localized and context-specific knowledges in achieving sustainable development outcomes. But recognising and respecting these cultural specificities is not sufficient in itself. Such context-specific knowledges also need to be applied in order to achieve sustainable development outcomes.

Efforts to promote sustainable livelihoods do not appear to have engaged directly with the legacy of environmental and social disruptions of previous decades. Future livelihoods development programs cannot ignore the need for ongoing reparative action to heal the environment and social dislocations caused by previous eras of development investment. Economic growth models that prioritise market-led development are likely to further exacerbate environmental problems and social polarization.

Detailed investigation of existing strengths and assets, with emphasis on Indigenous knowledge and practices of people in Western Province, will be crucial in overcoming the legacy of historic environmental disasters and preparing for the growing impacts of climate change. Constructing a detailed inventory of assets particular to villages and the varied ecologies of Western Province will provide a future programs and projects with the knowledge essential for shaping strengths-based development programs. Shedding light on these strengths and assets should go hand-in-hand with making more visible Indigenous agricultural knowledge and the gender roles and practices around them. Traditional agricultural practices and resources offer significant potential to inform future

pathways, building on the farming and fishing knowledge that has accumulated over generations of experimentation and adaptation to local conditions. Further documentation of such practices is an important step in their revival, and this can provide local communities (i.e., especially younger generations) and external actors (i.e., development agencies) with important information needed to strengthen agricultural resilience plan for the future.

Our findings demonstrate that few existing programs have sought to document and build upon the socio-cultural, economic and ecological specificities of the places in which interventions are taking place. The resulting program implementation has been driven by external priorities, with limited responsiveness to local conditions, (and limited participation from local communities, as Section III of the larger Scoping Study report shows). The limited success of previous projects is likely to have been the consequence of such trends.

8 Impacts

The impacts listed below apply for both FIS/2021/122 and FIS/2021/113.

8.1 Scientific impacts – now and in 5 years

This SRA was commissioned to inform future research and development investments in Western Province by ACIAR and DFAT, and our results have the potential for further impact as a model for a strengths-based approach to regional programming in PNG and elsewhere in the region.

Building resilience will be enhanced by having a broader base of understanding of place-based ecologies and their diverse economies from which any intervention can start. As signalled in the Australian Government's DFAT Partnerships for Recovery, Australia's COVID19 and the PNG COVID response plan, there is an urgent need for a more integrated approach to development.

The SRA Interim Report (2022) incorporated a summary of emerging findings, and initial recommendations, and informed the PNG-Australia Western Province Partnership Design. As the Western Province Partnership Plan is implemented we anticipate that the knowledge base produced by the combined SRAs will support better design of activities so they are positioned to build on current economic activity, harnessing current strengths and assets and align developing market systems with traditional social systems, and associated traditional norms and values. This knowledge base will also inform ACIAR's initiation of research projects targeting gender-sensitive agricultural improvements that build on the strengths, assets, and different livelihoods of specific places across the Western Province.

In future we anticipate that the findings of this project will support an increased engagement and citation of strengths-based, place-based and gender- sensitive approaches to development programming in future ACIAR research and development projects in the region.

8.2 Capacity impacts – now and in 5 years

Through engagement with members of the Stakeholder Reference Group and Key informants, the SRA's have encouraged greater understanding of the strengths and assets of Western Province and the potential of using a strengths based approach.

Members of the Stakeholder Reference Group were impressed by the maps created through this project and thought that they were important resources to help better contextualise the geography of the Province. The maps and discussions can provide helpful baseline information for various projects in Western Province being supported by DFAT and ACIAR.

Leveraging the value of strengths-based, place-based and gender-sensitive approaches, the Final Report has been received by Stakeholder Reference Group members to provide good baseline information for future agricultural development project in Western Province, including the preparation of proposals for Community Grant Schemes expected to be undertaken through the Western Province Partnership plan

Developers of training materials for the National Standards-Community Development Workers (CDWs) will be able to incorporate guiding questions that draw upon strengths-based approach and improve CDW training accordingly.

8.3 Community impacts – now and in 5 years

As a desktop review this scoping study did not engage directly with community members. However, as our recommendations are implemented it is expected that community members will come to benefit in a range of ways, including:

- Prioritisation of the voices and priorities of community members in design of future interventions
- Identification of existing strengths and capacities at the community level as the foundations for development efforts
- Implementation of community-led development planning
- Strengthening of existing livelihood strategies, including fishing and agriculture investments that strengthening capacity for community-based innovation
- Better appreciation of their own capacities and resources as the basis for economic and social development
- Future livelihood programming around commercial primary production that incorporates leadership and governance, financial literacy and gender equity training, ensuring that community members are well equipped to manage initiatives and distribute their benefits equitably.
- Strengthening of traditional food economies with effect of increasing food security
- Better appreciation of and capacity to use and improve community-based climate change adaptation systems as future investment programming builds on traditional knowledges and amplifies current strategies that prepare and help local communities mitigate risks from tidal inundation, saltwater incursion, increasing drought and flooding.

8.4 Communication and dissemination activities

A project website was established to assist with communication and dissemination: https://sarwesternprovince.wordpress.com/

The project was featured in The National Tribune on 02/05/2022: https://www.nationaltribune.com.au/new-study-to-draw-out-lessons-from-decades-of-development-work-in-png/

The project teams for FIS/2021/113 and FIS/2021/122 regularly attended the SFRP Implementing Partners Coordination Group monthly meetings, and presented twice about the projects:

- 10/02/2022, Introduction to the project
- 09/03/2022, Update on progress

Members of the SFRP-IPC group were:

Organisation	Names of members
Australian High Commission:	James Marshall, Amanda Young, Euodia Mosoro, Joe Manteit
Abt Associates	*PNG-Australia Governance Partnership* Ireire Olewale, Charles Ihembe, Stella Koaipura, Lucy Moore, Paul Bedggood

	PNG-Australia Transition to Health Geoff Miller
Reef and Rainforest Research Centre	Sheridan Morris, Tammie Matson *INLOC International* Ray Barrett, Baroa Lakani, Dave Rutherford
World Vision	Godfrey Bongomin, Erica Bradford, Christabel Chan, Sonia Yeung, Clement Chipokolo,
ACIAR	Katharine McKinnon, Katherine Gibson, Ann Fleming, Justin See, Pryor Placino, Doreen Iga, Ruby Jones
SFRP Specialists	Mark Moran, Mark Wolfsbauer, Hans Mollinger

Professor Katherine Gibson and Professor Katharine McKinnon presented a lecture entitled “Bringing social sciences to the fore to address gaps in donor programs in the Western Province of PNG” on 2 February 2023 at the ACIAR Fisheries workshop in Maroochydore, Queensland.

Professor Katherine Gibson and Dr Pryor Placino gave a seminar entitled “Scoping agricultural resilience in PNG’s Western Province from afar: Negotiating challenges posed by COVID and colonial knowing” on 16 November 2023 in the Institute for Culture and Society 2023 Seminar Series at Western Sydney University.

Two journal articles are currently in preparation for submission in early 2024.

9 Conclusions and recommendations

Through mapping the place-based strengths and assets of Western Province, the project (FIS/2021/122) found that people in Western Province have time-tested agrarian and fishery practices, Indigenous and women's knowledges, community-led governance systems, and more. However, published evidence on these assets in Western Province is currently limited and more work needs to be done to map and inventory these assets. Further studies that include field-based investigation of existing strengths and assets, including Indigenous agricultural knowledges and practices, in each type of ecological area is needed to provide the foundation for future programs in agricultural resilience.

Based on our findings from both SRAs, we suggest that future work in Western Province should target the following priorities:

1. Province-wide **human development to provide food security and adequate nutrition** is a first high priority as it provides the basis upon which communities can turn their attention to new activities and development agendas. Existing assets of the Province should form the foundations for future research-for-development investments that could better engage with artisanal and subsistence food production to underpin local livelihoods, food security and climate change resilience.
2. **Address environmental degradation and climate change** impacts. PNG in general is vulnerable to climate change, with extreme weather events such as drought and excessive rainfall serving as threats to food security. More work is needed to ensure that future programming builds community resilience and that investments by aid institutions and development partners support the country's transition to climate compatible development.
3. Ensure any **new initiatives targeted at cash income generation are ecologically, culturally and socially just.** This can be achieved with work to ensure initiatives 1) do not undermine practices that ensure food security and community-level distributional justice and 2) enhance practices of environmental maintenance and repair.
4. **Support for small-scale commercial activities across the Province must be adapted to the specific places where conditions are suitable** for development of cash crops, commercial fishing, logging, artisanal mining and eco-tourism. Where commercial activities are viable, communities must be supported with financial literacy and gender equity training to ensure that benefit is stewarded and distributed equitably. This is contingent on building an inventory of existing assets and strengths.

9.1 Recommendations

Our overall recommendation is to undertake **place-specific programming that can be achieved by attending to the physical, socio-cultural, economic and political particularities of the 7 unique ecosystems across Western Province.** Future research and development programs in the Province need to be adapted to the ecosystem in which they take place. This can only be achieved by careful preparatory work to co-design research plans and development activities together with local community partners to ensure a sound, shared understanding of the historical, cultural and social complexities of local contexts.

1. Investment in existing assets of the Province to better engage with **artisanal and subsistence food production to underpin local livelihoods, food security and climate change resilience.** Key assets identified include**:**

i. **The sago safety net:** Sago is a wild and semi-cultivated plant that provides food security and underpins agricultural resilience in the Province.
ii. **Indigenous traditional exchange:** Barter and Indigenous exchanges reinforce clan relationships and links between inland and coastal areas.
iii. **Artisanal fishing:** Coastal and fishing communities have long relied on fish and other seafood as a traditional source of food. Through small-scale fishing activities, women can cultivate mud crabs and raise tilapia, expanding their economic prospects.
iv. **Diverse language groups:** There are around 62 local languages in the Province. Each language provides a valuable storehouse of embedded Indigenous knowledge and practice.

2. A Province-wide research-for-development strategy should address the opportunities and challenges presented by these **7 ecosystems:**

i. **Sago:** a Province-wide resilience strategy focused on sago food security that could create multiple opportunities for holistic human development.
ii. **Drought-affected remote South Fly:** drought management for ongoing food security and access to clean water.
iii. **Flood-affected Middle Fly:** flood management and drainage, flood-tolerant crop varieties, and forest conservation initiatives with sustainable livelihood alternatives to logging.
iv. **Fishing and coastal ecosystems:** sustainable fisheries management to strengthen basic food security and climate change adaptation in fisheries systems, to target small-scale commercial activities where viable.
v. **Fly River corridor:** develop ongoing community-based monitoring of commercial agriculture projects and remediation of riverine environments.
vi. **Mining and hinterland:** improve food security and livelihoods alternatives in anticipation of mine closure.
vii. **P'nyang gas corridor:** ensure impacts of the pipeline construction minimizes social and ecological harm and increases opportunities for communities to benefit from new transport infrastructure.

3. Investments in commercial primary production should be linked **with leadership and governance, financial literacy and gender equity training, so that community members ensure benefit is stewarded and distributed equitably.** Commercial developments rarely provide widespread benefit to communities in Western Province and should not be prioritized in development programs until the necessary infrastructure and transport networks have been established. Existing commercialisation efforts have the potential to increase individual incomes, but can have damaging effects on community cohesion and ecological integrity. Interventions to ameliorate harm and maximise community benefits are required.

9.2 Suggestions for future programming

Based on our research findings across both SRAs and consultations with key informants and Stakeholder Reference Group members, we propose a series of possible future projects that could provide first steps to implementing our recommendations:

1. Address food security, building on Indigenous agricultural knowledge and traditional staple crops such as sago, to strengthen traditional food economies and harness opportunities for promoting gender equity based on place-based cultural and economic practices and knowledge systems.

2. Address water security: availability of clean water supply through community-based solutions for a) crop irrigation and improved production for food security in both drought- and flood-affected areas, and b) hygiene and gender equity.
3. Artisanal fisheries production and marketing – improving livelihoods through a) supporting small scale fisheries, improving access to markets with fish handling and storage solutions, and b) building capacity for community-led innovation in small scale fisheries.
4. Community-based climate change adaptation, harnessing traditional knowledges and amplifying existing strategies in anticipation of tidal inundation, saltwater incursion, increasing drought and flooding
5. Test viability of forms of a community income guarantee that supports a diversity of productive activities such as self-provisioning and commercial enterprises, natural and cultural resource management, etc. A basic income empowers people to choose how to solve their own problems on a voluntary basis in their own place, and could provide a response to income loss from mine closure to prompt community-based livelihood innovation.
6. Build new export opportunities based on lightweight, easily transportable and high value crops like vanilla and native species that grow well in the climate and soils of Western Province, such as heritage banana species.
7. Community-based environmental remediation program in mining areas and sites affected by mining disasters requires participation from community for planning and involvement
8. Undertake place-specific programming to develop community development plans – utilising and adapting the National Standards tools and training, testing suitability for cultural specificities of Western Province, in concert with community grants program

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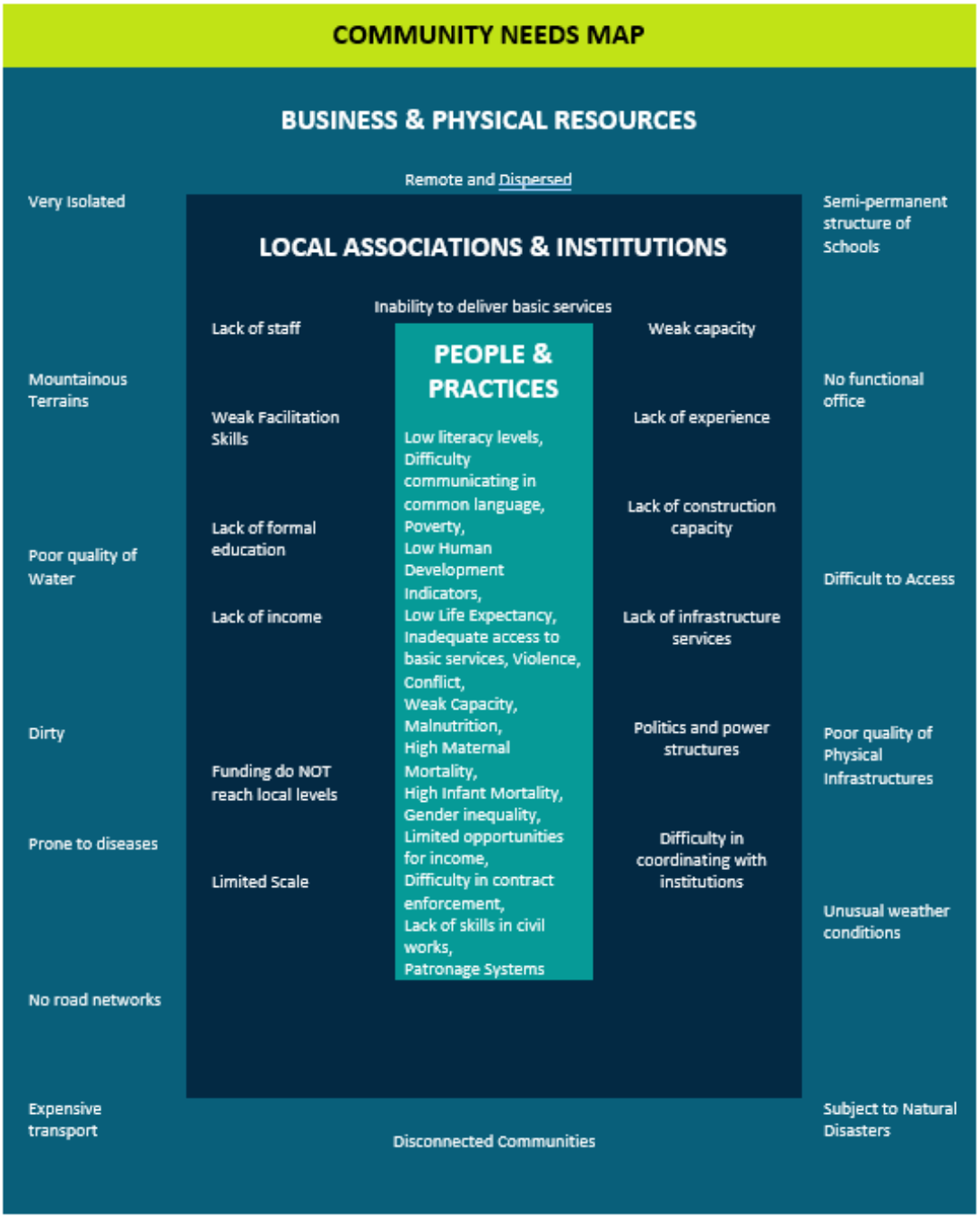
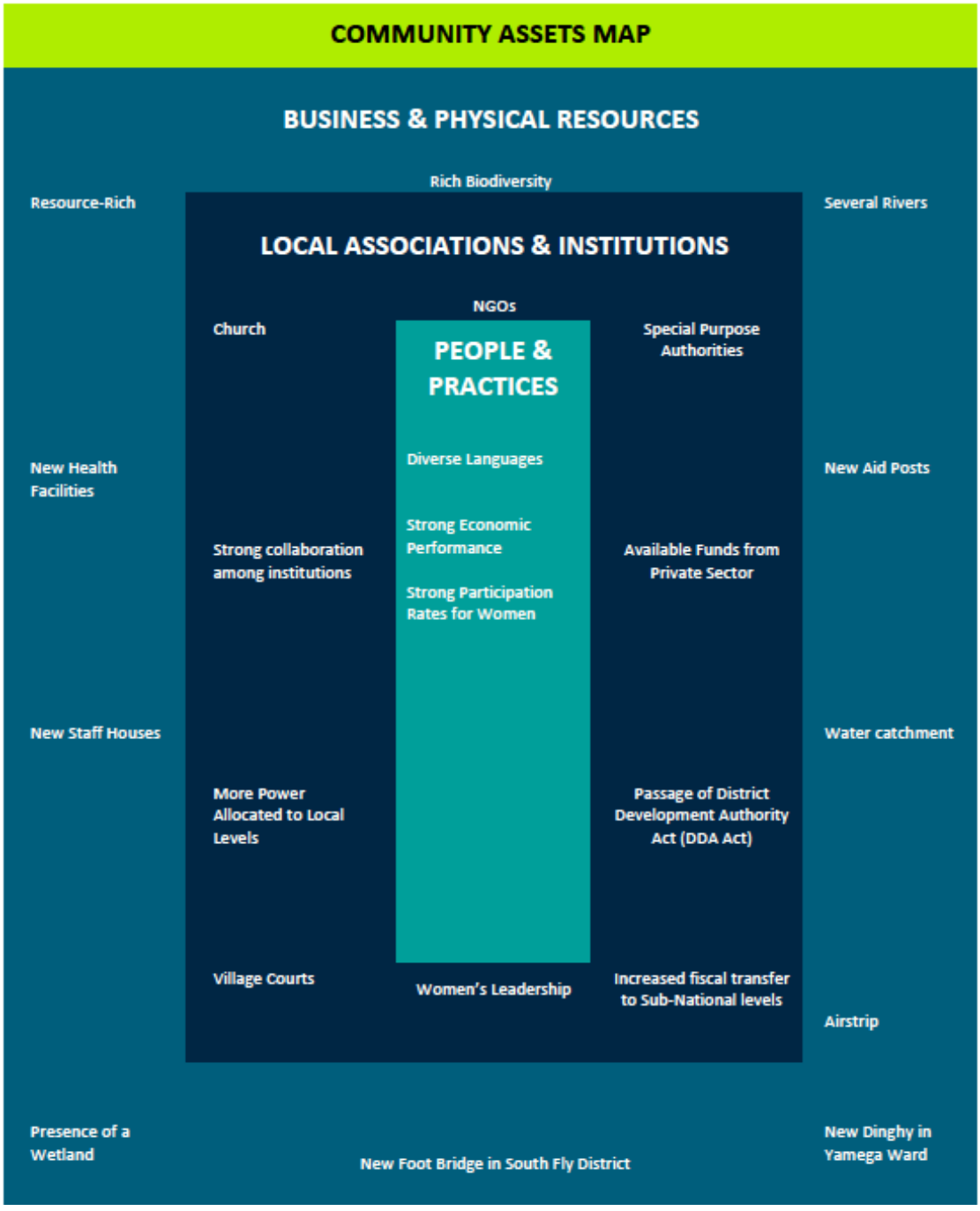
11 Appendixes

11.1.1 Appendix 1 Community Needs extracted from the World Bank's (2016) Rural Service Delivery and Local Governance Preparation and Pilot Report



11.1.2 Appendix 2 Community Assets extracted from the World Bank's (2016) Rural Service Delivery and Local Governance Preparation and Pilot Report



11.1.3 Appendix 3.

See attached report: ***'Strengthening Agricultural Resilience in Western Province: A Scoping Study'***