EU Action: Strengthening food production capacity and the resilience to drought of vulnerable communities

Desktop study of the selected areas for project activities

Table 1. Overview of target districts and LLGs, current population size

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Region\* | Province | District Name | District Pop | LLG Name | LLG Pop | Mode of Accessibility | Type of site (tentative) |
| Mo | Madang | Raicoast | 83,218 | Rai Coast Rural (Tep Tep) | 9,421 | Airstrip | Outreach site |
| Mo | Morobe | Kabwum | 43,472 | Selepet | 9,720 | District Airstrip | Pilot site |
| Mo | East Sepik | Wewak | 87,761 | Wewak Rural | 19,783 | Road network | Out-reach site |
| Mo | Madang | Bogia | 493,906 | Almami | 23,605 | Road network | Out-reach site |
| Mo | Madang | Rai Coast | 83,218 | Astrolabe Bay | 19,417 | Boat Route/  District Airstrip | Pilot site |
| Mo | Morobe | Menyamya | 87,209 | Kome | 31,043 | District Airstrip | Out-reach site |
| Mo | Morobe | Bulolo | 101,568 | Watut | 17,480 | District Airstrip/Road | Pilot site |
| Mo | Morobe | Finschafen | 2,905 | Kotte | 9,942 | District Airstrip/Boat route | Pilot site |
| NGI | Manus | Manus | 60,485 | Pobuma | 6,077 | Plane | Out-reach site |
| NGI | West New Britain | Talasea | 18,999 | Bali/Witu Rural | 16,665 | Sea Travel via Hoskins | Out-reach site |
| So | Central | Rigo | 56,509 | Rigo Central | 15,422 | Road Travel | Out-reach site |
| So | Central | Goilala | 36,092 | Tapini | 9,233 | Airstrip/Road | Out-reach site |
| So | Central | Abau |  | Amazon Bay |  | Sea, via Kupiano | Pilot Site |
| So | Western | Middle Fly | 79,349 | Gogodala | 33,033 | Airstrip | Pilot site |
| So | Western | South Fly | 59,152 | Oriomo-Bituri | 10,541 | Airstrip | Out-reach site |
| So | Milne Bay | Samarai-Murua | 58,590 | Louisiade Rural | 23,225 | Airstrip | Out-reach site |
| So | Milne Bay | Kiriwina-Goodenough | 639,165 | Kiriwina | 36,721 | Airstrip/Boat | Pilot site |
| So | Milne Bay | Esa’ala | 27,195 | Dobu RLLG | 22,781 | Airstrip/Boat | Out-reach site |
| So | Gulf | Kerema | 107,231 | Lakekamu-Titikaini | 13,263 | Road | Pilot site |
| So | Oro | Ijivitari | 186,309 | Afore | 18,535 | Road | Pilot site |
| So | Oro | Sohe | 86,547 | Kokoda urban | 20,925 | Road | Out-reach site |
| So | Gulf | Kerema | 107,231 | Kaintiba Rural | 12,955 | Airstrip | Out-reach site |
| Mo | West Sepik | Telefomin | 48,882 | Telefomin Rural | 11,734 | Airstrip | Pilot site |
|  |  | Total | 2,554,993 | Total | 391,521 |  |  |

\*Mo – Momase Region, NGI – New Guinea Island Region, So – Southern Region

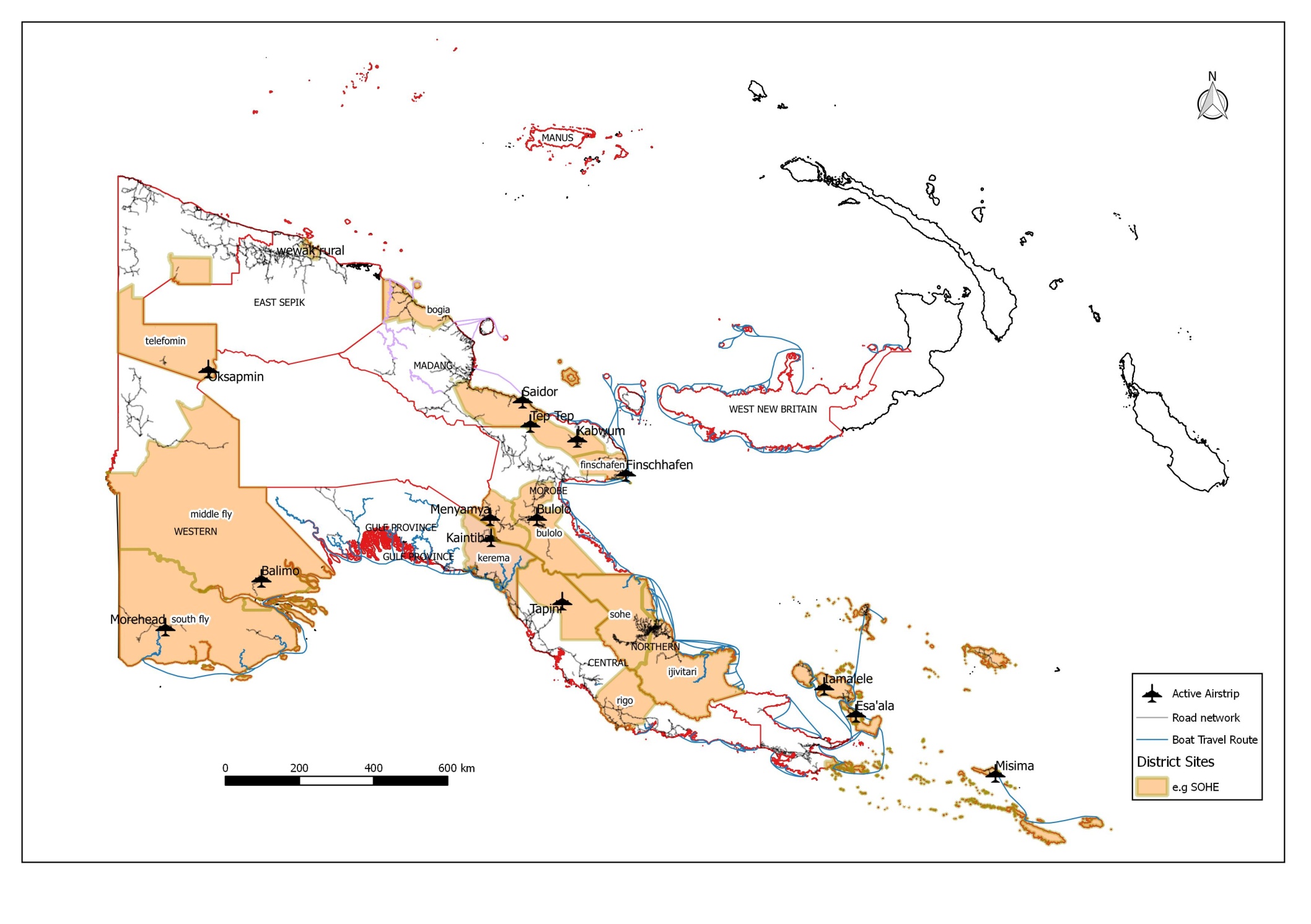


Figure 1. Overview of target Districts

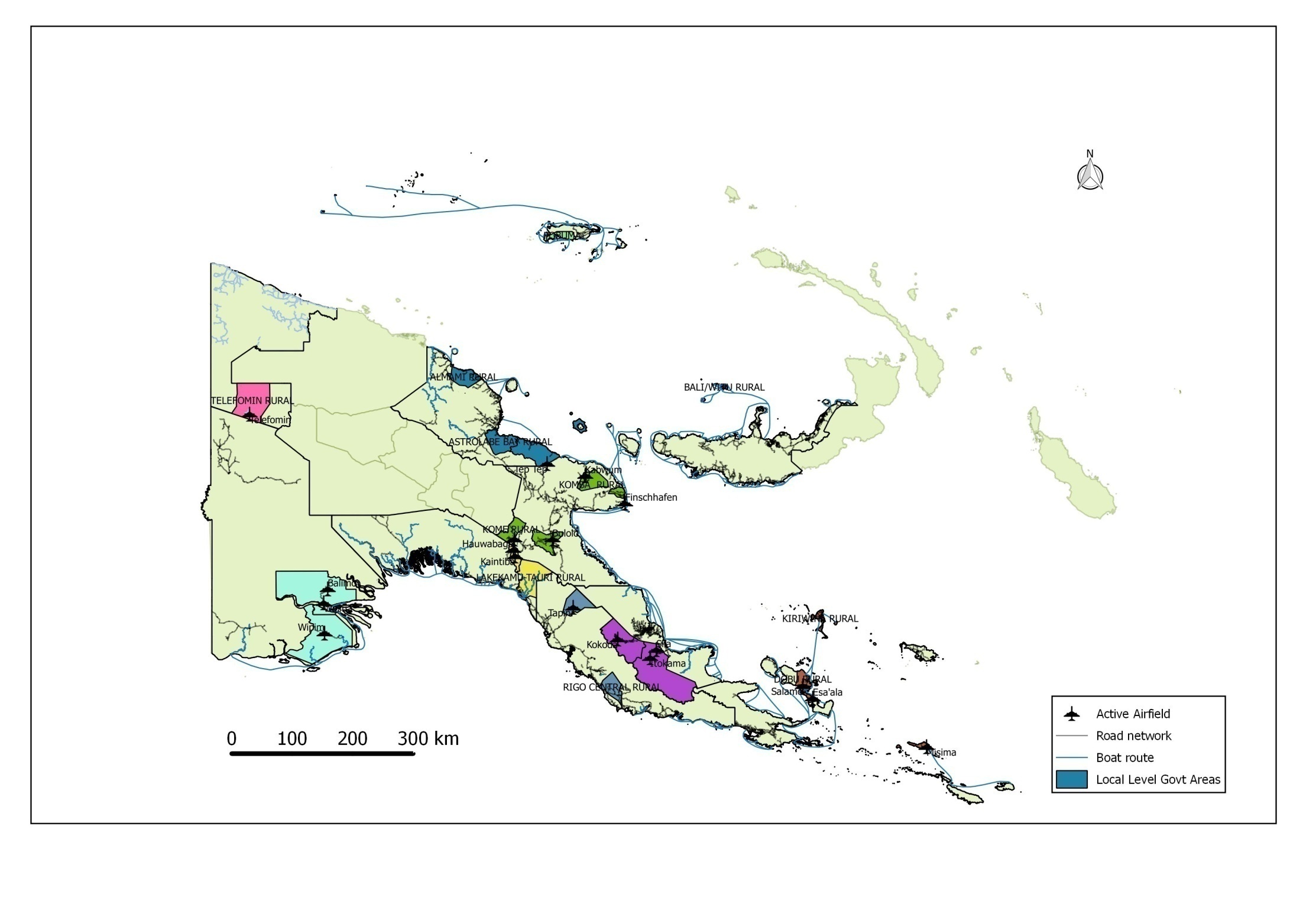


Figure 2. Overview of target LLG’s

Central Province

Agro-ecological, socio-economic and environmental vulnerability by LLG

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| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Central | 1. Rigo | Central Rigo |
| Description of the areas | Rigo District covers a total land area of about 5035 km2. The District Headquarter is based at Kwikila which is approximately 68 kilometers east of the nation’s capital Port Moresby  The district has 3 LLGs namely Rigo Central, Rigo Coastal and Rigo Inland. Rigo Central is the selected site of this EU Climate Change Resilient Project due to the severity of the impact of drought experienced in 2016.  According to 2011 Census, Rigo Central has a population of 15688 which is 31% of the District’s total population, second to that of Rigo Coastal. Of this, 53% is male and 47% is female, and 46% under the age of 18 whilst 54 is over the age of 17. The population density for Rigo Central LLG is about 12 persons per square kilometer. | | |
| Soil type |  | | |
| Rainfall | The district has a pronounced dry season, due to prevailing north-westerly and south-easterly winds from April to November. Mean annual rainfall ranges from 1100mm on the coastal plains to 3000mm in the mountainous regions. Annual mean maximum and minimum temperatures ranges from 32 to 19 respectively decreasing to 16 maximum and 9 minimum in the inland regions. | | |
| Water resources | The two major rivers of the district are the Kemp Welch and Ormond and a number of perennial creeks and streams which are mainly used for household purposes including drinking and cooking. | | |
| Main staple crop | Banana, cassava, yam and sweet potato |  |  |
| Secondary staple | Pumpkin |  |  |
| Tertiary staple | Taro tru, Chinese Taro |  |  |
| Plantation crop | Coconut |  |  |
| Fresh produce | Beans, aibika, peanut, pawpaw, pineapple | Tomato, pitpit, cucumber, watermelon, | Chinese cabbages |
| Major livestock farming | Launakalana Cattle Ranch but owned by the Livestock Development Corporation. This is an integrated farming ranch which also produces fruits and horticultural crops such as mango, pineapple, cashew and introduced vegetables as well as local staple crops | | |
| Smallholder livestock farming | Village Chicken | Village Pig | Broiler Chicken |
| Most favored protein source | Wallaby | Fish |  |
| Other resources | For small to large farm irrigation requirement, the Kemp Welch River, which runs through the Central Rigo (with its head from Inland Rigo and mouth at Coastal Rigo) has an adequate water supply that can be used by the villages along the bank such as Boregaina, Saroa-Keina and Goulupu. | | |
| Agro-industrial processing | There was a cassava plantation at Launanakalana, Central Rigo LLG, for production of biofuel in around 2007-2009 by a private foreign investor promoted by National DAL and endorsed by then Rigo MP, but the project fell through. | | |
| Environmental threats and issues | Bush fires, floods |  |  |
| Reported disaster events | 2016 El Nino heavily affected most parts of Central Rigo, especially Boregaina Village | | |
| Current development projects/plans | Currently ChildFund PNG is implementing a climate change related agriculture project in partnership with the Central Provincial DAL and NARI in Central and Inland Rigo. The project, which is sponsored by USAid is implemented in 12 villages, of which 2 are in Central Rigo. | | |
| Past development projects | In the past, Child Fund also implemented some smallholder livestock intervention project, particularly various trainings on goats and village and broiler chickens in mostly Inland Rigo villages especially Seba and Kokorogoro.  ChildFund also implemented water & sanitation projects in Seba Village.  NARI also implemented part of ACIAR Vegetable Project in a community in Inland Central Rigo (Girabu Village).  PNG Forest Authority also has implemented an ITTO funded project on Agroforestry in Gomore Village in Central Rigo, where NARI has been one of the collaborative partners. This project was about intercropping food crops with high valued timber trees, in particular, teak trees in the savannah grassland areas considered to be low in biodiversity and ecosystems. This project is currently in limbo due to funding matters between PNGFA and the International Tropical Timber Organization (ITTO) HQ in Japan. | | |
| Active NGO’s or CBO’s | ChildFund PNG, Salvation Army | | |
| Contact with PDAL advisor and DRDO | Mr. Kila Gege  Mr. Ruga Amo, Agriculture Manager, Rigo District | | 72341162 (Ruga) |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

1. Central Province, Rigo, Central Rigo LLG

|  |  |
| --- | --- |
| Strength   * Access by good road * Close to (1-2 hours drive from) Laloki * Presence of ChildFund PNG there * Some CC-food security work started there already by ChildFund PNG in collaboration with other partners (NARI & CP DAL) | Weaknesses   * Limited commitment by locals * High rate of migration to Port Moresby * Lack of access to clean drinking water |
| Opportunities   * Communities are faced with many CC related challenges in their farming activities so they might express great interest in participating in the project. | Threats   * Snake bites * El Nino * La Nina * Bush Fire |

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| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Central | Goilala | Tapini |
| Description of the areas | Highly mountainous causing agriculture pressure in the area. Steep slopes, long dry season and frequent cloud cover. Higher altitude areas are further constrained by low temperatures and frost. | | |
| Soil type | Soil structure is fair to favorable, but with high drainage. In Tapini texture class is dominated by silty clay particles. Exchangeable K concentrated in surface, and low at depth greater than 30cm at Tapini, whilst Olsen P high (40mg/kg) at surface to 30mg/kg at 30cm depth, and lower for depth greater than 30cm. PH averages at 6.8 from surface to the depth of 100cm. | | |
| Rainfall | The climate of the district is influenced by its physiographic setting especially the effect of Mt Owen Stanley Range. Mean Annual Rainfal spread across the entire district ranging from <2000mm on the coastal plains to >4000m in the inland mountainous regions that border with Oro and Morobe Provinces. The annual mean maximum and minimum temperatures ranges from 320 to 190, respectively. Further inland towards higher altitudes the temperature decreases to 160 maximum at the upper scale and 90 at the lower scale (minimum). | | |
| Water resources | Agriculture is entirely rain-fed, natural rivers and streams are exceptionally pristine. | | |
| Main staple crop | Sweet potato, |  |  |
| Secondary staple | banana, yam |  |  |
| Tertiary staple | Rice, flour, tinned fish (mainly Tapini Station) |  |  |
| Plantation crop | Coffee but grown and owned by smallholders. Coffee is non active due to no active market in Central Province. | | |
| Fresh produce | Chocko leaves, ‘kumu mosong’, pumpking tips, round cabbages, English Potato, eating banana | | |
| Major livestock farming |  |  |  |
| Smallholder livestock farming | Village pig, village chicken |  |  |
| Most favored protein source | Pig, wild games |  |  |
| Other resources | Coffee (Arabica) | | |
| Agro-industrial processing |  | | |
| Environmental threats and issues | Landslides, bushfire, frost (in higher altitude areas) | | |
| Reported disaster events | 2016 Frost affected certain areas of the district. | | |
| Current development projects/plans | Currently there is a promotion of late blight resistant English Potato varieties across Goilala district. This is the initiative of the Member, Hon. William Samb. They use chopper and plane to move the potato seeds as well as the products. | | |
| Past development projects | ACIAR Vegetable Project implemented by NARI at Tapini Station. Agronomic trials on English Cabbage, carrot and broccoli. The results showed that these vegetables have potential to grow in Tapini area. | | |
| Active NGO’s or CBO’s | Catholic mission |  |  |
| Contact with PDAL advisor and DRDO | Kila Gege |  |  |
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1. Central Province, Goilala, Tapini LLG

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| Strength   * Airfield * Road access (but not reliable due to landslides) * Potential for brassicca production | Weaknesses   * Poor and challenging road conditions * The area affected by frost during 2016 drought is further up in the higher altitudes areas and not in Tapini, so accessibility will be a challenge. * Limited arable land * Long distance travel by road (5 hours from POM-Laloki) |
| Opportunities   * Organized women farmer groups exist and they have strong interest in farming * High altitude vegetables for markets in Port Moresby | Threats   * Lack of cooperation from DPI Officers, * Lack of cooperation from the church (catholic mission) and government agencies. |

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| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Central | Abau | 1. Amazon Bay |
| Description of the areas |  | | |
| Soil type |  | | |
| Rainfall |  | | |
| Water resources |  | | |
| Main staple crop | Cassava, Sweet potato, banana, coconut |  |  |
| Secondary staple | Yam |  |  |
| Tertiary staple | Rice, tinned fish |  |  |
| Plantation crop | Rubber, coffee, corporate but rundown (no markets) |  |  |
| Fresh produce | Pawpaw, pineapple, aibika, pumpkin tips |  |  |
| Major livestock farming |  |  |  |
| Smallholder livestock farming | Village chickens, village pigs, |  |  |
| Most favored protein source | Pig meat, fish |  |  |
| Other resources | Rubber, coffee, | | |
| Agro-industrial processing |  | | |
| Environmental threats and issues | El Nino |  |  |
| Reported disaster events | El Nino 2016 severely affected, people were living in bush foods |  |  |
| Current development projects/plans |  |  |  |
| Past development projects | NARI Laloki established a Resource Centre at Bailebo under Abau ARD Project being funded by Abau District DSIP. The fund was exhausted, and the project needs continued funding and attention to conduct training, distribute materials and livestock. | | |
| Active NGO’s or CBO’s | Bailebo Women in Agriculture (active, on the ground but not formalized yet ), Sustainable Livelihood Group (assisted in maintaining the Resource Centre under the Abau AR4D project; active, but not formalized yet). | | |
| Contact with PDAL advisor and DRDO | Kila Gege |  |  |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

Central Province, Abau, Amazon Bay LLG

|  |  |
| --- | --- |
| Strength   * Corporation of communities are very high | Weaknesses   * Accessibility only by boat via Kupiano |
| Opportunities   * Organized women farmer groups exist and they have strong interest in farming * 2016 El Nino impacts | Threats   * Drought * Floods |

Western Province

Agro-ecological, socio-economic and environmental vulnerability by LLG

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| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Western | Middle Fly | Gogodala |
| Description of the areas | Middle Fly covers extensive plains, flood plains and hills of the Fly and Strickland rivers from Nomad in the north to the Fly River delta in the south.    The district head quarter is Balimo. Most people require 4-8 hours travel to reach the nearest service centre. There are minor roads around Nomad and Balimo but these are in poor condition and there are few vehicles. Outboard motor boat and canoe travels are common along the Fly, Strickland, Aramia and Bamu rivers (Hanson et.al, 2001). | | |
| Soil type | Main soil types for Middle Fly are plinthudults (60%), dystropepts (20%), hydraquents (10%), fluvaquents(7%), and tropudults (3%) (Gwabu, ARISED Project, 2010)  Mean figures for 10 sites (samples) along the mostly inhabited area along Aramia River to Bamu River including Balimo Station analysis from soils up to 30 cm depth have the following results.   * pH Level of 5.3 * Organic Carbon level of 4.2% * Total Nitrogen of 0.26% * Carbon-Nitrogen Ratio of 16.35 * Olsen P of 13.64 mg/kg * Calcium of 3.74 me% * Magnesium of 0.62 me% * Potassium of 0.2me% * Magnesium : potassium ratio of 3.15   (Gwabu and Pal, ARISED PROJECT, 2010). | | |
| Rainfall | Average annual rainfall ranges from 2100 mm in the Fly River delta to over 4000mm in Lake Murray. There is a long dry season south of Lake Murray. Altitude varies from sea level to 400 meters in the hills southeast of Nomad  (Hanson et.al, 2001). | | |
| Water resources | Wetland area, but safe drinkable water is a problem. | | |
| Main staple crop | Sago is the most important food in the district and is supported by low intensity mixed staple cultivation (Hanson et.al, 2001).  According to NARI’s ARISED Project PRRA survey conducted in 2009 covering 570 respondents across the three districts of Western Province it was found out that there are **7 important/staple foods (crops and vegetables)** for the Western Province. Over 40-80% of the cases indicated the importance of these food crops by how frequently they consume, hence, in descending order of cases are: (1) **sago,** (2)**banana**, (3)**cassava,** (4) **aibika and** (5) **sweet potato.** Further 20-30% of the cases have indicated (6) **taro** and(7) **yam**, as staple foods.(Gwabu, ARISED PROJECT, 2010).  Note: The original data containing info for each district is being lost so using the province data which sourced from the main report. | | |
| Secondary staple | According to NARI’s ARISED Project PRRA survey conducted in 2009 covering 570 respondents across the three districts of Western Province it was found out that   * The supplementary food items that are consumed frequently, in descending order are **coconut, wild leaves, pumpkin, fruits and nuts, and maize.** * For store foods that are used as supplementary foods are **rice, flour, and tinned foods (eg. tinned fish).** | | |
| Tertiary staple |  |  |  |
| Plantation crop | In middle Fly main plantation crop is Rubber, but mainly from Balimo up the Aramia River and also there must be some rubber in the Lake Murray. These rubber are owned by smallholders.  According to ARISED Project:  **Research & Development Intervention Issues in Tree Cash Crops are:**  ***1 Cash Crops: Current Situation***   * **Rubber and (2)coconut** are the main cash crops. However, we should be very careful with coconut figure here because there is strong likelihood that some farmers only have a few non-commercial level trees but have recorded as cash crops. This means that only rubber tends to be the largest cash crop in the province. * Middle Fly has the highest (154) cases of cash crops, followed by South Fly and the North Fly. North Fly by itself has 60% of the cases with cash crops, Middle Fly 70% of the cases from itself, while South Fly has 40% of the respondents with cash crops. This would mean that on the ground level, there are more cash crop farmers in North Fly than there are in South Fly. * OTDF supplying eagle wood seedlings to the communities.   ***2 Cash Crops: Future Request (R&D Intervention Scenario)***   * 15 to almost 40% of the cases are (1) **interested in rubber and/or have requested for rubber planting materials,** (2**) interested in and/or have requested for coconut and hybrid coconut planting materials.** * 96% of farmers in Middle Fly want **processing facilities (particularly rubber factory) in the Middle Fly itself**. | | |
| Fresh produce | Middle Fly area is highly deficient in fresh produce, especially in and around Balimo area, but there is a potential for pineapple production. The Member for Middle Fly, Mr. Roy Biama has been doing his own rubber plantation, pineapple plantation and jetropha plantation since early 2000 in Balimo area as a way of teaching his people but he mentions that the uptake by his people is very little to zero (pers comm. with Roy Biama, 2011) | | |
| Major livestock farming | There is a cattle farm owned by provincial DAL at Balimo, but it was been declining over the years.  According to ARISED Project: | | |
| Smallholder livestock farming | According to ARISED Project:  **Research & Development Intervention Issues in Livestock Areas.**  ***1 Current Livestock situation in the province***   * Currently, the biggest livestock raised is **village chicken**, followed by **village pigs**. The third largest livestock raised is **cassowary**, followed by broiler chicken and ducks which are both on the forth place. * By districts, North Fly has the highest cases of village pig, followed by south Fly and Middle Fly which both have almost equal. Middle Fly has the highest cases of village chicken followed by North Fly and then South Fly. Broiler chicken is mainly raised in North Fly and South Fly; there is no case of broiler chicken in Middle Fly. On the other hand cassowary is mainly raised in Middle Fly followed by South Fly, while there is no case in North Fly.   ***2 Livestock Requested – R&D Intervention Scenarios***   * Following livestock type, in descending order of cases, have been requested for: (1) **chicken poultry**; (2) **ducks**, (3) **goats**, (4) **Piggery**; (5) **sheep**, (6) **cattle**, (7) **Australops chickens**, (8) **crocodile farming**, (9) **rabbits**, (10) **broiler Chickens**, (11) **aquaculture** and (12) **hybrid pigs**. * Up to 12% of cases requested for, in descending order, (1) **deer farming**, (2)**layer chicken**, (3)**cassowary farming**, (4)**buffalo**, (5) **village chicken** and (6) **village pig**. * Note that some cases generally mentioned chickens without specifying whether they want village chicken, Australops, or broiler chicken. These groups are accounted for in the general chicken group. * Note that many cases interested in pigs have not specified whether village pig or hybrid pigs. In this case they are aggregated above as interested in ‘piggery’. | | |
| Most favored protein source | Fish (and other sea/aqua products) and game meats (eg. pigs, cassowary, deer) are consumed most frequently. Tinned fish is a common protein for those families that access to some money. | | |
| Other resources | Aquaculture: According to ARISED Project  **Research & Development Intervention Issues in Aquaculture Areas**  ***1 Future training need for Aquaculture:***   * Although, only 12 (out of 421) cases said they do farm fish, but * Majority of the cases have requested for training on (1) ‘all aspects of aquaculture/fish farming’, and (2) ‘basic fisheries/fish pond management’. * Other training are requested are **(1) fish feed making**, **(2)‘net/seine net mending/ making including methods of using seine nets,** **(3) breeding techniques** and **(4) fish processing**. | | |
| Agro-industrial processing | None, but people requested for rubber cup lump processing factory. | | |
| Environmental threats and issues | Middle Fly is mostly wetland, limiting agriculture potential, and invasive water hyacinth is as a real challenge and problem; sand banks, ‘King’ tides. | | |
| Reported disaster events | 2016 El Nino affected many communities |  |  |
| Current development projects/plans |  |  |  |
| Past development projects | From 2009-2012 NARI, through the ARISED Project supplied, high yielding and drought tolerant materials of cassava, sweet potato, African yam, corn, TLB resistant taro. The Agriculture Resource Centre was set up at the provincial DAL settings at Balimo Station, and in 2010 and one year later a satellite resource centre was set up at Saweta Village up the Aramia River. Current status of this resource centres are not known, but our belief is that they are not existent and the supplied materials are not maintained any more. | | |
| Major food crop production constraints | According to NARI’s ARISED Project PRRA survey conducted in 2009 covering 570 respondents across the three districts of Western Province it was found out that there are   * Crops with **disease** problems as indicated by survey, in descending order are: (1)**taro**, (2)**banana**, (3)**yam**, (4)**cassava,** (5)**sweet potato, (6) aibika and (7)sago.** * Crops with **pest** problems as indicated by the survey, in descending order are: (1)**taro**, (2)**sweet potato**, (3)**aibika**, (5)**banana**, (6)**cassava**, (7)**yam**, (8)**pulses**, (9)**sago** and (10)**maize**. * Crops with **soil** problems as indicated by the survey are: (1)**sweet potato, (2)taro, (3)cassava, (4)banana, (5)yam, (6)sago, (7)aibika, (8)pulses and (9)maize.** * Crops with **flood** problems as indicated by the survey are: (1)**taro, (2)cassava, (3)sweet potato, (4)banana, (5)yam, (6)sago, (7)aibika, (8)pulses and (9)maize** | | |
| Active NGO’s or CBO’s | OTDF, Community development assistance from Pogera Gold Mine | | |
| Contact with PDAL advisor and DRDO | Mr. Eric Mallen Provincial Agriculture Advisor | Mr. Sogowa District Agriculture Manager |  |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

1. Western Province, Middle Fly, Gogodala LLG

|  |  |
| --- | --- |
| Strength   * OTDF’s presence can be a strengthen in terms of transport logistics as well as helping accomplish some activities as they have agriculture officers. * Awaba Secondary School can be used as a major demonstrations site. * Mr. Sogowa, the District DAL Manager is quite active, and given instruction, he can follow, but need to be monitored closely. * Airfield at Balimo and Lake Murray | Weaknesses  The only transport from Port Moresby is by air, and Balimo sometimes can be overcast and very wet preventing flights going there. |
| Opportunities   * Middle Fly is one of the rural areas with high food security problem and the communities are most likely to be willing to adopt new farming methods. | Threats   * Air travel unreliability due to contrasting weather (prolong rain and clouds at Balimo) |

Agro-ecological, socio-economic and environmental vulnerability by LLG

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Western | South Fly | Oriomo-Bituri |
| Description of the areas | South Fly covers the extensive plains and flood plans sout and wst of the Fly River from near Lake Ambuve to the Fly River Delta. Thesouth of the district cover the plains and flood plains of the Oriomo, Pahoturi, Mai Kussa, Kutubura, Morehead and Benscbach rivers (Hanson et.al, 2001). | | |
| Soil type | Main soil types for Middle Fly are plinthudults (70%), hydraquents (15%), fluvaquents(10%), and fluvaquents(5%), (Gwabu and Pal, ARISED Project)  Mean figures for 15 sites (samples) along the mostly inhabited area in South Fly analysis from soils up to 30 cm depth have the following results.   * pH Level of 5.12 * Organic Carbon level of 2.17% * Total Nitrogen of 0.22% * Carbon:Nitrogen Ratio of .29 * Olsen P of 6.76 mg/kg * Calcium of 5.55 me% * Magnesium of 2.90 me% * Potassium of 0.25 me% * Magnesium : potassium ratio of 13.30   (Gwabu and Pal, ARISED PROJECT, 2010). | | |
| Rainfall | Average annual rainfall ranges from 1500 on the south coast to 2200 mm around Suki. There is a long dry season in the entire district. Altitude varies from sea level to 100 meters northeast of Wipim (Hanson et.al, 2001). | | |
| Water resources | Oriomo is the main river (water source) in Oriomo-Bituri LLG. Towards the north of the LLG is the big river, the Fly River. | | |
| Main staple crop | Sago is the most important food in the district and is supported by low intensity mixed staple cultivation (Hanson et.al, 2001).  According to NARI’s ARISED Project PRRA survey conducted in 2009 covering 570 respondents across the three districts of Western Province it was found out that there are **7 important/staple foods (crops and vegetables)** for the Western Province. Over 40-80% of the cases indicated the importance of these food crops by how frequently they consume, hence, in descending order of cases are: (1) **sago,** (2)**banana**, (3)**cassava,** (4) **aibika and** (5) **sweet potato.** Further 20-30% of the cases have indicated (6) **taro** and(7) **yam**, as staple foods.(Gwabu and Pal, ARISED PROJECT, 2010).  Note: The original data containing info for each district is being lost so using the province data which sourced from the main report. | | |
| Secondary staple | According to NARI’s ARISED Project PRRA survey conducted in 2009 covering 570 respondents across the three districts of Western Province it was found out that   * The supplementary food items that are consumed frequently, in descending order are **coconut, wild leaves, pumpkin, fruits and nuts, and maize.** * For store foods that are used as supplementary foods are **rice, flour, and tinned foods (eg. tinned fish).** | | |
| Tertiary staple |  |  |  |
| Plantation crop | In middle Fly main plantation crop is Rubber, but mainly from Balimo up the Aramia River and also there must be some rubber in the Lake Murray. These rubber are owned by smallholders.  According to ARISED Project:  **Research & Development Intervention Issues in Tree Cash Crops are:**  ***1 Cash Crops: Current Situation***   * **Rubber and (2)coconut** are the main cash crops. However, we should be very careful with coconut figure here because there is strong likelihood that some farmers only have a few non-commercial level trees but have recorded as cash crops. This means that only rubber tends to be the largest cash crop in the province. * Middle Fly has the highest (154) cases of cash crops, followed by South Fly and the North Fly. North Fly by itself has 60% of the cases with cash crops, Middle Fly 70% of the cases from itself, while South Fly has 40% of the respondents with cash crops. This would mean that on the ground level, there are more cash crop farmers in North Fly than there are in South Fly. * **OTDF supplying seedlings of Eagle wood**   ***2 Cash Crops: Future Request (R&D Intervention Scenario)***   * 15 to almost 40% of the cases are (1) **interested in rubber and/or have requested for rubber planting materials,** (2**) interested in and/or have requested for coconut and hybrid coconut planting material.** | | |
| Fresh produce | South Fly area is highly deficient in fresh produce, but there is a potential for pineapple production. | | |
| Major livestock farming |  | | |
| Smallholder livestock farming | According to ARISED Project:  **Research & Development Intervention Issues in Livestock Areas.**  ***1 Current Livestock situation in the province***   * Currently, the biggest livestock raised is **village chicken**, followed by **village pigs**. The third largest livestock raised is **cassowary**, followed by broiler chicken and ducks which are both on the forth place. * By districts, North Fly has the highest cases of village pig, followed by south Fly and Middle Fly which both have almost equal. Middle Fly has the highest cases of village chicken followed by North Fly and then South Fly. Broiler chicken is mainly raised in North Fly and South Fly; there is no case of broiler chicken in Middle Fly. On the other hand cassowary is mainly raised in Middle Fly followed by South Fly, while there is no case in North Fly.   ***2 Livestock Requested – R&D Intervention Scenarios***   * Following livestock type, in descending order of cases, have been requested for: (1) **chicken poultry**; (2) **ducks**, (3) **goats**, (4) **Piggery**; (5) **sheep**, (6) **cattle**, (7) **Australops chickens**, (8) **crocodile farming**, (9) **rabbits**, (10) **broiler Chickens**, (11) **aquaculture** and (12) **hybrid pigs**. * Up to 12% of cases requested for, in descending order, (1) **deer farming**, (2)**layer chicken**, (3)**cassowary farming**, (4)**buffalo**, (5) **village chicken** and (6) **village pig**. * Note that some cases generally mentioned chickens without specifying whether they want village chicken, Australops, or broiler chicken. These groups are accounted for in the general chicken group. * Note that many cases interested in pigs have not specified whether village pig or hybrid pigs. In this case they are aggregated above as interested in ‘piggery’. | | |
| Most favored protein source | Fish (and other sea/aqua products) and game meats (eg. pigs, cassowary, deer) are consumed most frequently. Tinned fish is a common protein for those families that access to some money. | | |
| Other resources | Aquaculture: According to ARISED Project  **Research & Development Intervention Issues in Aquaculture Areas**  ***1 Future training need for Aquaculture:***   * Although, only 12 (out of 421) cases said they do farm fish, but * Majority of the cases have requested for training on (1) ‘all aspects of aquaculture/fish farming’, and (2) ‘basic fisheries/fish pond management’. * Other training are requested are **(1) fish feed making**, **(2)‘net/seine net mending/ making including methods of using seine nets,** **(3) breeding techniques** and **(4) fish processing**. | | |
| Agro-industrial processing | None, | | |
| Environmental threats and issues | Sand banks, and ‘King’ tides, El Nino, La Nina | | |
| Reported disaster events | 2016 El Nino affected communities in Bituri and Oriomo areas | | |
| Current development projects/plans |  |  |  |
| Past development projects | From 2009-2012 NARI, through the ARISED Project supplied, high yielding and drought tolerant materials of cassava, sweet potato, African yam, corn, TLB resistant taro. The Agriculture Resource Centre was set up at the in Daru, and in 2010, but later transferred to Oriomo but both have failed due to non attention by South Fly District Agriculture officers.  PNGSDP funded project on Technology Transfer implemented by NARI (Laloki) | | |
| Major food crop production constraints | According to NARI’s ARISED Project PRRA survey conducted in 2009 covering 570 respondents across the three districts of Western Province it was found out that there are   * Crops with **disease** problems as indicated by survey, in descending order are: (1)**taro**, (2)**banana**, (3)**yam**, (4)**cassava,** (5)**sweet potato, (6) aibika and (7)sago.** * Crops with **pest** problems as indicated by the survey, in descending order are: (1)**taro**, (2)**sweet potato**, (3)**aibika**, (5)**banana**, (6)**cassava**, (7)**yam**, (8)**pulses**, (9)**sago** and (10)**maize**. * Crops with **soil** problems as indicated by the survey are: (1)**sweet potato, (2)taro, (3)cassava, (4)banana, (5)yam, (6)sago, (7)aibika, (8)pulses and (9)maize.** * Crops with **flood** problems as indicated by the survey are: (1)**taro, (2)cassava, (3)sweet potato, (4)banana, (5)yam, (6)sago, (7)aibika, (8)pulses and (9)maize** | | |
| Active NGO’s or CBO’s | Ok Tedi Development Foundation (OTDF), LDS (Later Days Saints) | | |
| Contact with PDAL advisor and DRDO | Mr. Mallen Provincial Agriculture Advisor | Mr. Giboi Waine Agriculture Manager |  |
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1. Western Province, South Fly, Oriomo-Bituri LLG

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| --- | --- |
| Strength   * Airfield at Daru served by both PNG Air and Air Niugini. | Weaknesses   * Poor cooperation of district agriculture officers as encountered in 2010-12 during the implementation of ARISED Project. We hope there is an improvement now. |
| Opportunities  Severe food shortages in the Oriomo-Bituri area should encourage the uptake of new farming methods. | Threats   * King Tides * Sand banks * Strong winds * Water log * El Nino * La Nina |

Milne Bay Province

Agro-ecological, socio-economic and environmental vulnerability by LLG

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| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Milne Bay | Samarai-Murua | Louisiade Rural |
| Description of the areas |  | | |
| Soil type |  | | |
| Rainfall | Average rainfall ranges from a on Samarai Island, to 4000 mm on Woodlark Island. Altitude varies from sea level to over 1000 meters on Mt Datau on Misima Island (Hanson et. al 2001). | | |
| Water resources |  | | |
| Main staple crop | Banana |  |  |
| Secondary staple | Sago |  |  |
| Tertiary staple | Rice, flour, tinned fish, bought from store |  |  |
| Plantation crop | Coffee owned by stallholders | |  |
| Fresh produce |  |  |  |
| Major livestock farming |  |  |  |
| Smallholder livestock farming | Poultry (broiler) chicken farming, village chicken, and village pigs. |  |  |
| Most favored protein source | Fish |  |  |
| Other resources |  | | |
| Agro-industrial processing |  | | |
| Environmental threats and issues | Salinity, Sea level rise | | |
| Reported disaster events | 2016 El Nino affected communities on the island | | |
| Current development projects/plans |  |  |  |
| Past development projects |  |  |  |
| Active NGO’s or CBO’s | None, but there are a good number of land owner group associations, and there is a coffee cooperative society.  In Alotau there is also the presence of Conservation International which also reaches out to island communities. | | |
| Contact with PDAL advisor and DRDO | District Administrator, Mr. Hayden Abraham: 70364399 |  |  |
|  | DAL Agriculture Advisor Mr. Jonathan Kapoila: number |  |  |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

1. Milne Bay Province, Samarai-Murua, Louisiade Rural LLG

|  |  |
| --- | --- |
| Strength   * Airfield, plane goes there three times a week * Infrastructures developed and left behind by the then Misima Gold Mine * NARI Laloki has a strong link with the Milne Bay provincial DAL. * Milne Bay DAL is very active, and they strictly follow their development plans | Weaknesses   * Isolation * Long distance travel (if by boat) * Communication * NARI never had a project before on the island so there is a lack of information |
| Opportunities   * Tourism promotion in Milne Bay is good agriculture market source for the rural communities | Threats   * Strong winds * Rough seas * Sea pirates |

Agro-ecological, socio-economic and environmental vulnerability by LLG

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Milne Bay | Kiriwina-Goodenough | Kiriwina |
| Description of the areas |  | | |
| Soil type |  | | |
| Rainfall |  | | |
| Water resources |  | | |
| Main staple crop | According to a survey conducted in 2013 (Gwabu et.al), the staple food of Kiriwina are:   * cassava (93% of the people consume it on daily basis, whilst   7% consume it, once or twice a week),   * sweet potato (71% of the people consume it on daily   basis, 15% consume it 3-5 days a week, and another 14% consume it once or twice a week);   * yam (50% of them consume it almost on daily basis, 29% consume it 3-5 days a week,14% consume it one, or twice a week); * banana (50% of the people eat on daily basis, 36% of the   people consume it 3-5 days a week, 14% of the people consume it one or two times a week);   * taro tru (43% of the people consume it on daily basis, another 43% consume it 3-5 days a week, whilst 14% consume it once or twice a week); * taro Singapo (14% consume it on daily basis, 21% of the people consume it once or twice a week, another 21% consume it once or twice a month, 44% of the people do not grow singapo); | | |
| Secondary staple | Processed foods like rice, flour and tinned meat are consumed on the island too but less frequently in comparison to the consumption of garden foods. Generally consumption of rice and flour are once or twice a week to once or twice a month. | | |
| Tertiary staple |  |  |  |
| Plantation crop | Coconut for home consumption only |  |  |
| Fresh produce |  | | |
| Major livestock farming |  |  |  |
| Smallholder livestock farming | According to Gwabu et.al (2013),  About 70 of the village people raise small informal village based livestock. Of these,   * 60%raise only village chicken, * 20% raise both village chicken and pigs, whilst * 10% raise only pigs. * Chickens are raised mainly for own (home) consumption whilst pigs are raised for both own (home) consumption as well also for cultural/social obligations. Village chicken is sold for K10 per bird, rarely beyond this level, and the maximum would be K20. Pigs are sold for K1500 per live pig.   **Constraints to smallholder livestock production**  Main constraints to livestock production are theft especially for chicken and lack of feed supply both for pigs and chickens.  ***Additional kinds of livestock types requested***  About 53% of the village people have request for introduction of new livestock breeds. Of this 75% are already raising livestock, whilst the remaining 25% are not raising livestock at the moment.   * 63% request for pigs, * 50% request for ducks, * 38% request for chicken, * 20% for goats, * 20% for sheep.   Of those people who do not want new livestock introduced, 70% of them are already raising livestock whilst 30% are not. About 14% of them do not want to get new livestock introduced is because of the fear about introduced pest and disease of livestock as they hear from rumours. Another 14% of the people are not willing to have new livestock introduced is because they do not have much land space to cater for the livestock. | | |
| Most favored protein source | In terms of protein 64% of the people consume fish on a daily basis, whilst 21% of the people consume it 3-5 days a week, whilst 7% of the people consume it once, or twice a week (Gwabu et. al,2013). | | |
| Other resources | Fish product, especially beachdemer, pandanus leaves (for mats, baskets, house thatched roof and hand-crafts). An economic analysis of pandanus leaves will have to be made. | | |
| Agro-industrial processing |  | | |
| Environmental threats and issues | Sea level rise, declining soil fertility due to high agricultural pressure, El Nino | | |
| Reported disaster events | 2016 El Nino |  |  |
| Current development projects/plans | Provincial Agriculture Food Security program supplied, and continues to supply food crop materials (including NARI released ones), and rice. There is an active promotion of rice, even on Kiriwina Island. | | |
| Past development projects | NARI has done some work on yam nutrition in early 2000’s, and then some NARI technology transfer work funded by PNGSDP in mid 2000’s, and recently some work under the GIZ funded-OCCD coordinated project. | | |
| Active NGO’s or CBO’s | * Conservation International based in Alotau; * There is a Canadian Foundation implementing solar project in Kiriwina Secondary School. This is especially will be considered if Kiriwina Secondary School becomes one of the demonstration/multiplication sites. I (Clifton Gwabu) met with two solar engineering professors from a university in Canada who were on Kiriwina Island in May this year and discussed this option with them, where NARI could collaborate with them in solar-driven water pump technology. They were impressed in principle, but said to go back to Canada and discuss the matter with the Founder of the Foundation under which they have the project at Kiriwina Secondary School. | | |
| Contact with PDAL advisor and DRDO | Mr. Jonathan Kapoila  Mr. Gensen Kadi, District DDA: 71760041 |  |  |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

1. Milne Province, Kiriwina-Goodenough, Kiriwina LLG

|  |  |
| --- | --- |
| Strength   * Airfield, plane goes there 2 times a week * NARI Laloki has a strong link with the Milne Bay provincial DAL. * Milne Bay DAL is very active, and they strictly follow their development plans | Weaknesses   * Isolation * Long distance travel (if by boat) * Limited Communication |
| Opportunities   * Tourism promotion in Milne Bay is a good agriculture market source for the rural communities | Threats   * Strong winds * Rough seas * Sea pirates |

Agro-ecological, socio-economic and environmental vulnerability by LLG

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Milne Bay | Esa’ala | Dobu Rural |
| Description of the areas | Esa’ala District covers Amphlett Group, Fergusson Island, Normanby Island, Waiopa Island, Neumara Island and Dobu Island. | | |
| Soil type |  | | |
| Rainfall | The average rainfall for the district ranges from 2000 mm near Iamalele to 3300 mm near Darubia. | | |
| Water resources |  | | |
| Main staple crop | Agriculture on the Deidei Peninsula, the southeast coast of Normanby Island, and Dobu, Waiopa and Neumara islands are dominated by low intensity mixed cultivation.  On Dobu Island, “during harvest time, which is from April to July, and extends to October which is planting time, people leave on yam and banana. After the planting season they live on sweet potatoes, cassava and banana.”  (Julie Maiko\*, pers. comm.) \* *Julie is a local person from Dobu Island whom I know her many years. I communicated with her on Facebook and she provided this information, saying that was based on her latest visit to the island in 2015.* | | |
| Secondary staple | “Of course, rice, flour, tinned meat and tinned fish also supplement their diets” (Ibid) | | |
| Tertiary staple |  |  |  |
| Plantation crop |  |  |  |
| Fresh produce |  |  |  |
| Major livestock farming |  |  |  |
| Smallholder livestock farming | Pigs |  |  |
| Most favored protein source | “Protein is scarce. Most of the corals around the island are bleached and dead, so that poses a scarcity on fish supply, which is the common protein in the area. Pig meats are only consumed during feasts, not on any ordinary days. Of course, … tinned fish and tinned also supplement their” proteins (Ibid) | | |
| Other resources |  | | |
| Agro-industrial processing |  | | |
| Environmental threats and issues | Coral Bleaching | | |
| Reported disaster events | 2016 El Nino |  |  |
| Current development projects/plans |  |  |  |
| Past development projects | Distribution of NARI released planting materials, and rice by the Milne Bay Provincial DAL from their multiplication centre at Bubuletta DPI Station. | | |
| Active NGO’s or CBO’s | * Conservation International based in Alotau; | | |
| Contact with PDAL advisor and DRDO | Jonathan Kapoila  Mr. Dimiki Doura, Esa’la DDA: 72050205 |  |  |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

1. Milne Province, Esa’ala, Dobu Rural LLG

|  |  |
| --- | --- |
| Strength   * NARI Laloki has a strong link with the Milne Bay provincial DAL. * Milne Bay DAL is very active, and they have good record of follow their development plans | Weaknesses   * No airfields * Isolation * Long distance travel (5-6 by boat from Alotau and 2-3 hours from East Cape ) * Limited Communication * From the Google Earth map, it appears there are other smaller islands apart from Dobu Island which probably fall under Dobu LLG, which may have been hit hard by 2016 Drought, but we have no detailed knowledge of this. If so possible multiple locations for project activities beyond Dobu Island itself needs careful planning, logistics and resource wise. These also include Esa’ala and other communities, which are on Normanby Island, and Salamo and other communities which are on the east of Fergusson Island. |
| Opportunities   * Tourism promotion in Milne Bay is a good agriculture market source for the rural communities * Given El Nino related food security challenge, the communities should have high incentive for participation and receiving new technologies. * Moderate to high potential agricultural land * Relatively a short shipping distance to Alotau * A reliable and regular coastal barge service between Goodenough, Fergusson and Normanby Islands supported by extension activities, could encourage production of crops like cocoa and coconut which are well suited to the area. | Threats   * Strong winds * Rough seas * Sea pirates |

Gulf Province

Agro-ecological, socio-economic and environmental vulnerability by LLG

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| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Gulf Province | Kerema | Lalekamu-Kitikaini |
| Description of the areas |  | | |
| Soil type |  | | |
| Rainfall | Average annual range fall for Kerema District ranges from 1300 mm near Kerema to over 3600 mm in the Ivori Valley. Altitude varies from the sea level to over 2700 m on the Morton Peaks north of Kaintiba. | | |
| Water resources | Tauri and Lakekamu rivers rung through the Kerema district. | | |
| Main staple crop | People in the Lakekamu, Ivori, Ankevi, Lohiki and Mbwei valleys cultivate low intensity banana and sweet potato. Also taro and Singapore Taro | | |
| Secondary staple | Sago | Breadfruit, | pitpit |
| Tertiary staple | Rice |  |  |
| Plantation crop | Coconut |  |  |
| Fresh produce | Aibika, pawpaw, pineapple |  |  |
| Major livestock farming |  |  |  |
| Smallholder livestock farming | Village chicken, village pigs |  |  |
| Most favored protein source | Talapia, pig meat, local chicken meat |  |  |
| Other resources | Impact of LNG project | | |
| Agro-industrial processing |  | | |
| Environmental threats and issues | Floods, El Nino, La Nina |  |  |
| Reported disaster events |  |  |  |
| Current development projects/plans |  |  |  |
| Past development projects |  |  |  |
| Active NGO’s or CBO’s |  |  |  |
| Contact with PDAL advisor and DRDO | Mr. Gibson Jack, Agriculture & Livestock Director, Gulf Province: 73953530  Mr. George Sasu, Admin Officer, DAL Gulf 72330558 | | |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

1. Gulf Province, Kerema, Lalekamu-Kitikaini LLG

|  |  |
| --- | --- |
| Strength  The land potential is high to very high on the plains of the Tauri and Lakekamu rivers, north of Malalaua.  Reasonable road access | Weaknesses |
| Opportunities  On coming of LNG Project – as a market source for locals to grow and supply vegetables, fruits and other agricultural products. | Threats   * Impact of LNG on labour movement and other agriculture resources. |

Agro-ecological, socio-economic and environmental vulnerability by LLG

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| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Gulf Province | Kerema | Kaintiba |
| Description of the areas |  | | |
| Soil type |  | | |
| Rainfall |  | | |
| Water resources |  | | |
| Main staple crop | People in Kaintiba area make low intensity sweet potato gardens. | | |
| Secondary staple | Singapore taro, taro tru, corn | | |
| Tertiary staple | Breadfruit, rice, flour | | |
| Plantation crop |  |  |  |
| Fresh produce |  |  |  |
| Major livestock farming |  |  |  |
| Smallholder livestock farming |  |  |  |
| Most favored protein source | Inland fish, wild pig meat, village chicken meat |  |  |
| Other resources |  | | |
| Agro-industrial processing |  | | |
| Environmental threats and issues |  |  |  |
| Reported disaster events |  |  |  |
| Current development projects/plans |  |  |  |
| Past development projects |  |  |  |
| Active NGO’s or CBO’s |  |  |  |
| Contact with PDAL advisor and DRDO |  |  |  |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

1. Gulf Province, Kerema, Kaintiba LLG

|  |  |
| --- | --- |
| Strength  Active airfield for third level planes available. | Weaknesses  Very low to low agriculture potential due to high rainfall, poor soils and steep slopes.  Some agriculture pressures in the Kaintiba area, where moderate population densities occur on very poor land. Fallow vegetation is degraded and food production is difficult.  The most disadvantaged people in Kerema District are those in the Lohiki, Ivoiri, Ankevi and Mbwei valleys west of Kaintiba, who are constraint by low potential environments, poor access to services and very low incomes. |
| Opportunities  On coming of LNG Project – as a market source for locals to grow and supply vegetables, fruits and other agricultural products. | Threats   * High labour out-migration |

Oro Province

Agro-ecological, socio-economic and environmental vulnerability by LLG

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Oro Province | Ijivitari | Afore |
| Description of the areas | Ijivitari covers the coastal floodplains Ambasi to Oro Bay, Mt Lamington, the Managalas Plateau and the Pongani and Barji valley. | | |
| Soil type | Soils, slope, light and temperature are ideal for the production of many crops. | | |
| Rainfall | Rainfall ranges from 1900 mm in the Moni Valley to 3000 mm on the Managalas Plateau. Altitude ranges from sea level to over 3500 mm in the Owen Stanley Ranges. | | |
| Water resources |  | | |
| Main staple crop | Sweet potato, Sago , coconut |  |  |
| Secondary staple |  |  |  |
| Tertiary staple |  |  |  |
| Plantation crop | Oil Palm plantation owned by foreign companies but local work in the plantations. |  |  |
| Fresh produce | Aibika, pineapple, pawpaw |  |  |
| Major livestock farming |  |  |  |
| Smallholder livestock farming | Village chicken, village pigs, |  |  |
| Most favored protein source |  |  |  |
| Other resources |  | | |
| Agro-industrial processing | Palm oil | | |
| Environmental threats and issues |  |  |  |
| Reported disaster events | EL Nino 2016 |  |  |
| Current development projects/plans |  |  |  |
| Past development projects | The Northern Province Food Restoration and Food Security (NPFRP) is the major initiative in Oro Province that is funded by the Kokoda Trek Foundation (KTF). NARI, SRC-Laloki is one of the collaborating partners in the project through the PNGSDP in 2010-2011. The project utilized educational institutions as resource centers for multiplying and distributing crop planting materials, conducting trainings and disseminating information .  The project has established nurseries at UNRE, Ilimo, Martyrs Secondary School, Dobuduru Primary School and Sariri. Around 500 NARI taro suckers were supplied from the Sariri nursery and training conducted at Kokoda vocational and primary schools. The Martyrs nursery distributed planting materials to Tufi LLG whilst some were distributed through students and teachers network to their villages. The Ilimo nursery however, had to be relocated because the Sohe Government wanted the land for other development projects and teacher shortage was hindering operations at the Dobuduru nursery. A total of 14 trainings were conducted on planting technique, soil management and disaster preparedness.  Twenty farmers were involved in a survey to assess the economic viability of villages and LLGs marketing fresh vegetables. The survey results would be used as the basis for seeking funding assistances.  A one hectare piece of land at Sejera was allocated to PNGCCI to establish a resource centre and for the project to establish a mother nursery, which was to be used for training, production and distribution of planting materials.  Status of these resource centres and the sustainability of the supplied materials in the farmers fields are not known. | | |
| Active NGO’s or CBO’s |  |  |  |
| Contact with PDAL advisor and DRDO |  |  |  |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

1. Oro Province, Ijivitari, Afore LLG

|  |  |
| --- | --- |
| Strength   * Land potential is very high on the volcanic plains and fans inland of Popondetta and Wanigela. The land is amongst the most productive in PNG. | Weaknesses   * Rainfall is high inland of Popondetta |
| Opportunities   * Good land potential, volcanic soils | Threats |

Agro-ecological, socio-economic and environmental vulnerability by LLG

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Oro Province | Sohe | Kokoda Rural |
| Description of the areas | Sohe District covers the Owen Stanley Range, the Waria Valley, the coastal floodplains of the Gira, Mambare and Kumusi rivers and the upper Mambare Valley around Kokoda. The volcanic plains and fans of Mt Lamington occupy the south of the district. | | |
| Soil type | Land potential is very high on the volcanic plains and fans inland of Popondetta. | | |
| Rainfall | Average annual rainfall ranges from 2900 mm in the Aria Valley to 3800 mm in the upper Mambare Valley. Altitude varies from sea level to over 40000 m on Mt Victoria. Most people live in the valleys bellow 1000 m. | | |
| Water resources |  | | |
| Main staple crop | Sweet potato, Chinese taro, |  |  |
| Secondary staple | Banana, yam |  |  |
| Tertiary staple | Rice, tinned fish, flour |  |  |
| Plantation crop | Coffee (smallholder, but rundown), rubber (harvesting), cocoa (rundown) |  |  |
| Fresh produce | ‘kuru sako’ (chocko leaves. |  |  |
| Major livestock farming | Only one farmer looking after 8 cows |  |  |
| Smallholder livestock farming | Village chicken, ducks (not much), |  |  |
| Most favored protein source |  |  |  |
| Other resources | Alluvial gold mining, tourism, citrus fruits, honey bee production. | | |
| Agro-industrial processing |  | | |
| Environmental threats and issues | Landslides |  |  |
| Reported disaster events |  |  |  |
| Current development projects/plans | ADRA – Adra is implementing a project titled ‘Kokoda Livelihood Opportunity Project: The focus of the project is on agriculture and tourism. NARI is a partner to the project.  This is a nine month project and will wind up in around end of year 2017. Simon Sangi of NARI Laloki went with the ADRA team in the beginning of this year (2017) to assist with the Baseline Survey | | |
| Past development projects |  |  |  |
| Active NGO’s or CBO’s | ADRA. | 4727088/722323055 (Lae office)  Kokoda project site 735 11102 |  |
|  | KDA |  |  |
| Contact with PDAL advisor and DRDO |  |  |  |
|  |  |  |  |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

1. Oro Province, Sohe, Kokoda Rural LLG

|  |  |
| --- | --- |
| Strength   * Good road access from Kokoda to Popondetta taking 2 hours 30 minutes. The road is in good condition. * Airfield at Kokoda * High agriculture potential * Good Digicel communication network | Weaknesses   * People’s attitude is that they want results presently, else they lose interest. |
| Opportunities   * High agricultural potential, | Threats   * Moderate agricultural pressure |

Identifiable constraints and suggested interventions

The information in this table will assist us in moving towards development of the intervention strategies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| District/LLG | Identified constraints/problems associated with drought | Suggested interventions | Available technologies | Partner requirements |
| Teptep | Shifting rainfall affects garden calendar | Chart the calendar changes | Staff technical capacity | Community relations |
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Other needs for desktop study:

1. Provide available maps of the Districts and LLG’s
2. Provide a rainfall, temperature and humidity chart for each District/LLG
3. Make of list of known contacts and agents within the government, NGO or CBO networks
4. Identify any critical issues associated with agriculture such as major anthropogenic environmental changes (e.g. mining, forestry, SABL, industrial development)

Further agenda for Action Technical Committee meeting:

1. Stakeholder analysis – identify, characterize and assess the capacity of major stakeholders
2. Problem analysis – further from SWOT and identified constraints, determining cause and effect relationships
3. Objective analysis – develop solutions from the identified problems and identify means to end relationships [We can begin this process and finalize before Inception meeting]
4. Strategy analysis identify and select the most appropriate strategy [Completed at Inception meetings]

Note: The log frame has already been developed and clearly the drought is identified problem, however, we need to agree on the above agenda before moving forward with planning and implementation.

Agro-ecological, socio-economic and environmental vulnerability by LLG

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| **ADD’s** | **Madang** | 1. **Rai Coast** 2. **Rai Coast** 3. **Bogia** | 1. **Teptep** 2. **Astrolabe** 3. **Alamani** |
| Description of the areas | Coastal, wet-humid, mountainous with tropical rain forest | 1.  2.  3. | 1.  2.  3. |
| Soil type | Alluvial, fertile, high/low water table | 1.  2.  3. | 1. low water table  2. low water table  3. low water table |
| Rainfall | Seasonal rainfall pattern | Seasonal rainfall pattern | Seasonal rainfall pattern |
| Water resources | Agriculture is entirely rain-fed, natural rivers and streams are exceptionally pristine | Agriculture is entirely rain-fed, natural rivers and streams are exceptionally pristine | Agriculture is entirely rain-fed, natural rivers and streams are exceptionally pristine |
| Main staple crop | Sweet potato, Yam | 1. Sweet potato  2. Yam (D. esculenta)  3. Yam (D.esculenta) | 1. Sweet potato  2. Yam (D. esculenta)  3. Yam (D. esculenta) |
| Secondary staple | Banana | 1.  2.  3. Banana | 1.  2.  3. Banana |
| Tertiary staple | None | 1. None  2. None  3. None | 1. None  2. None  3. None |
| Plantation crop | Oil palm, Sugar, Coconut, Vanilla, Cocoa | 1. None  2. None  3. Coconut, Cocoa | 1. None  2. None  3. Coconut, Cocoa |
| Fresh produce | Coastal tropical vegetables | 1. Coastal tropical vegetables  2. Coastal tropical vegetables  3. Coastal tropical vegetables | 1. Coastal tropical vegetables  2. Coastal tropical vegetables  3. Coastal tropical vegetables |
| Major livestock farming | Cattle | 1. None  2. None  3. None | 1. None  2. None  3. None |
| Smallholder livestock farming | Poultry, Piggery | 1. Poultry, Piggery  2. Poultry, Piggery  3. Poultry, Piggery | 1. Poultry, Piggery  2. Poultry, Piggery  3. Poultry, Piggery |
| Most favored protein source | Poultry, Fish | 1. Poultry  2. Poultry  3. Poultry | 1. Poultry  2. Poultry  3. Poultry |
| Other resources | Terrestrial bush animal, village chickens, crayfish, eels, migratory fish, crocodile | 1. Terrestrial bush animal, village chickens, crayfish, eels, migratory fish, crocodile  2. Terrestrial bush animal, village chickens, crayfish, eels, migratory fish, crocodile  3. Terrestrial bush animal, village chickens, crayfish, eels, migratory fish, crocodile | 1. Terrestrial bush animal, village chickens  2. Terrestrial bush animal, village chickens, crayfish, eels, migratory fish  3. Terrestrial bush animal, village chickens, crayfish, eels, migratory fish, crocodile |
| Agro-industrial processing | Fish canary, coconut oil, palm oil, sugar, cocoa | 1.  2.  3. | 1. None  2. None  3. Coconut, Cocoa |
| Environmental threats and issues | Environment pollution (nickel mining and fish canary, drought | 1.  2.  3. | 1.  2.  3. |
| Reported disaster events | Nickel spillage, drought, flood | 1.  2.  3. | 1.  2.  3. |
| Current development projects/plans | PMIZ, Madang-Jimi highway | 1.  2.  3. | 1.  2.  3. |
| Past development projects | Fish canary, nickel mining, timber | 1.  2.  3. | 1.  2.  3. |
| Active NGO’s or CBO’s | World Vision, Adventist Church | 1.  2.  3. | 1.  2.  3. |
| Contact with PDAL advisor and DRDO | World Vision, Kud Sitango (NARI). Comes from Rai Coast and may have contacts; Tom Nami (DAL Advisor); Joe Naram (DAL officer); PDAL, DDAL | 1.  2.  3. | 1.  2.  3. |
| **Element** | **Province** | **District** | **LLG** |
| **ADD’s** | **East Sepik** | **Wewak** | **Wewak rural** |
| Description of the areas | Coastal, wet-humid, mountainous with tropical rain forest | Coastal, wet-humid, mountainous with tropical rain forest | Coastal, wet-humid, mountainous with tropical rain forest |
| Soil type | Alluvial, fertile, high/low water table | Alluvial, fertile, high/low water table | Alluvial, fertile, low water table |
| Rainfall | Seasonal rainfall pattern | Seasonal rainfall pattern | Seasonal rainfall pattern |
| Water resources | Agriculture is entirely rain-fed, natural rivers and streams are exceptionally pristine | Agriculture is entirely rain-fed, natural rivers and streams are exceptionally pristine | Agriculture is entirely rain-fed, natural rivers and streams are exceptionally pristine |
| Main staple crop | Banana, Sago, Yam | Banana | Banana |
| Secondary staple |  | Sago | Sago |
| Tertiary staple |  | Yam | Yam |
| Plantation crop | Cocoa, Vanilla, Coconut, Coffee | Cocoa, Vanilla, Coconut, Coffee | Cocoa, Vanilla, Coconut, Coffee |
| Fresh produce | Coastal tropical and temperate vegetables | Coastal tropical vegetables | Coastal tropical vegetables |
| Major livestock farming | None | None | None |
| Smallholder livestock farming | Poultry | Poultry | Poultry |
| Most favored protein source | Fish and poultry, crocodile | Fish and poultry | Fish and poultry |
| Other resources | Gold (Frieda Mining), crocodile, marine |  |  |
| Agro-industrial processing | Fish canary (South sea tuna) | Fish canary (South sea tuna) |  |
| Environmental threats and issues | Flooding, drought, soil erosion, water pollution | Flooding, drought, soil erosion, water pollution | Flooding, drought, soil erosion, water pollution |
| Reported disaster events | Drought | Drought | Drought |
| Current development projects/plans | Oil palm |  |  |
| Past development projects |  |  |  |
| Active NGO’s or CBO’s | World Vision, CCEA |  |  |
| Contact with PDAL advisor and DRDO | PDAL, Mr. Willie Sangi, Provincial Fisheries Officer, 71745486 | DDAL, Mr. Jimi Risimeri CCEA Wewak 73944666/ 71334241 | Mr. Dong Manuk Agriculture Officer Wewak Rural |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Morobe | 1. Kabwum  2. Menyamya  3. Bulolo  4. Finchafen | 1. Selepet  2. Kome  3. Watut  4. Kotte |
| Description of the areas | Coastal, wet-humid, mountainous with tropical rain forest | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Soil type | Alluvial, fertile, high/low water table | 1.  2.  3.  4. | 1. Alluvial, fertile, low water table  2. Alluvial, fertile, low water table  3. Alluvial, fertile, low water table  4. Alluvial, fertile, low water table |
| Rainfall | Seasonal rainfall pattern | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Water resources | Agriculture is entirely rain-fed, natural rivers and streams are exceptionally pristine | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Main staple crop | Sweet potato | 1. Sweet potato  2. Sweet potato  3. Sweet potato  4. Sweet potato | 1. Sweet potato  2. Sweet potato  3. Sweet potato  4. Sweet potato |
| Secondary staple | Chinese taro, taro true | 1. Banana, Chinese taro, taro true, yam  2. Banana, Chinese taro, taro true, yam  3. Banana, Chinese taro, taro true, yam  4. Banana, Chinese taro, taro true, yam | 1.  2.  3.  4. |
| Tertiary staple |  | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Plantation crop | Cocoa, Coffee | 1.  2. Coffee  3. Cocoa  4. | 1.  2.  3.  4. |
| Fresh produce | Range of fresh coastal and temperate vegetables | 1. Coastal to temperate vegetable  2. Coastal to slightly temperate vegetable  3. Coastal to slightly temperate vegetable  4. Coastal vegetable | 1.  2.  3.  4. |
| Major livestock farming | Cattle | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Smallholder livestock farming | Piggery, poultry, crocodile, fishery | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Most favored protein source | Fish, chicken, pork | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Other resources | Gold mining, forestry, hydro, marine | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Agro-industrial processing | Fish canary |  |  |
| Environmental threats and issues | Flooding, drought, soil erosion, water pollution | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Reported disaster events | Drought, flood | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Current development projects/plans | Gold mining, road, fish canary, Coffee PPAP | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Past development projects |  | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Active NGO’s or CBO’s | World Vision, ADRA, LDS, Christian churches | 1.  2.  3.  4. | 1.  2.  3.  4. |
| Contact with PDAL advisor and DRDO | PDAL Morobe, DDAL (Kabwum, Menyamya, Bulolo, Finchafen) | 1. Tale Yusitu (70739350), former employee of NARI; DDAL  2.  3.  4. | 1.  2.  3. Awateng Naru (NARI), from Watut.  4. Tom Kili (Agric Officer/Manager 71857353, Kotte, Finchafen); Pascal Pandau (NARI, worked on PRAP 2013/14 Finchafen);. |
| **Element** | **Province** | **District** | **LLG** |
| **ADD’s** | **West Sepik** | **Telefomin** | **Telefomin rural** |
| Description of the areas | Coastal, wet-humid, mountainous with tropical rain forest | Coastal, wet-humid, mountainous with tropical rain forest | Coastal, wet-humid, mountainous with tropical rain forest |
| Soil type | Alluvial, fertile, high/low water table | Alluvial, fertile, high/low water table | Alluvial, fertile, low water table |
| Rainfall | Seasonal rainfall pattern | Seasonal rainfall pattern | Seasonal rainfall pattern |
| Water resources | Agriculture is entirely rain-fed, natural rivers and streams are exceptionally pristine | Agriculture is entirely rain-fed, natural rivers and streams are exceptionally pristine | Agriculture is entirely rain-fed, natural rivers and streams are exceptionally pristine |
| Main staple crop | Sweet potato, taro | Sweet potato, taro | Sweet potato, taro |
| Secondary staple | Sago | Sago | Sago |
| Tertiary staple | None | None | None |
| Plantation crop | None | None | None |
| Fresh produce | Coastal tropical vegetables | Coastal tropical vegetables | Coastal tropical vegetables |
| Major livestock farming | None | None | None |
| Smallholder livestock farming | Poultry, fish, piggery | Poultry, fish, piggery | Poultry, fish, piggery |
| Most favored protein source | Poultry, fish, piggery | Poultry, fish, piggery | Poultry, fish, piggery |
| Other resources | Gold mining (Mt Frieda), crocodile, marine |  |  |
| Agro-industrial processing | Oil palm |  |  |
| Environmental threats and issues | Flooding, drought, soil erosion, water pollution, sea water rise | Drought | Drought |
| Reported disaster events | Tsunami, drought | Drought | Drought |
| Current development projects/plans | Oil palm |  |  |
| Past development projects |  |  |  |
| Active NGO’s or CBO’s | World Vision, Christian churches |  |  |
| Contact with PDAL advisor and DRDO | PDAL Sandaun, DDAL, Mr. Joe Guaf (Provincial Food Crops Officer, DAL Vanimo); Neomothy Provincial DAL Officer 70995726 |  |  |

SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

|  |  |
| --- | --- |
| Strengths  **1. Madang**  Teptep/Rai Coast  Astralobe/Rai Coast  Alamani/Bogia  **2. East Sepik**  Wewak Rural/Wewak  **3. Morobe**  Selepet/Kabwum  Kome/Menyamya  Watut/Bulolo  Kotte/Finchafen  **4. West Sepik**  Telefomin rural /Telefomin | Weaknesses  **1. Madang**  Teptep/Rai Coast  Astralobe/Rai Coast  Alamani/Bogia  **2. East Sepik**  Wewak Rural/Wewak  **3. Morobe**  Selepet/Kabwum  Kome/Menyamya  Watut/Bulolo  Kotte/Finchafen  **4. West Sepik**  Telefomin rural /Telefomin |
| Opportunities  **1. Madang**  i. Teptep/Rai Coast  ii. Astralobe/Rai Coast  -increased integration of livestock and crop options to improve nutritional status (protein, micronutrients e.g. Vit A, iron)  increased cash income generation  -improved access to information, planting material, livestock breeding stock -improved understanding of market access issues and policy recommendations for improving market access -reduced periods of food shortages (due to seasonal weather events)  iii. Alamani/Bogia  **2. East Sepik**  Wewak Rural/Wewak  **3. Morobe**  i. Selepet/Kabwum  -production of fresh produce including temperate vegetables  -Cooperative groups formed  Kome/Menyamya  Watut/Bulolo  Kotte/Finchafen  **4. West Sepik**  Telefomin rural /Telefomin | Threats  **1. Madang**  Teptep/Rai Coast  -serious malnutrition <5 years; high percentage of stunting; very low income, hazardous sea travel to Madang  Astralobe/Rai Coast  Alamani/Bogia  -Unproductive environments (steep slopes, flooding); serious malnutrition, stunting, frequent cloud cover, high rainfall  -Generally  Malnutrition in children under 5 years; Some waterlogging, low soil fertility; Agriculture pressure (pop pressure on land; Manam - volcanic eruptions; Ramu plains- annual flooding and poor soils; cocoa pod borer  **2. East Sepik**  Wewak Rural/Wewak  **3. Morobe**  Selepet/Kabwum  -steep slopes; some parts long dry seasons, frequent cloud cover; lack of extension and marketing support for coffee; increasing pop and shortage of arable land  Kome/Menyamya  Watut/Bulolo  Kotte/Finchafen  **4. West Sepik**  Telefomin rural /Telefomin |

Identifiable constraints and suggested interventions

The information in this table will assist us in moving towards development of the intervention strategies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| District/LLG | Identified constraints/problems associated with drought | Suggested interventions | Available technologies | Partner requirements |
| Teptep | Shifting rainfall affects garden calendar | Chart the calendar changes | Staff technical capacity | Community relations |
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Other needs for desktop study:

1. Provide available maps of the Districts and LLG’s
2. Provide a rainfall, temperature and humidity chart for each District/LLG
3. Make of list of known contacts and agents within the government, NGO or CBO networks
4. Identify any critical issues associated with agriculture such as major anthropogenic environmental changes (e.g. mining, forestry, SABL, industrial development)

Further agenda for Action Technical Committee meeting:

1. Stakeholder analysis – identify, characterize and assess the capacity of major stakeholders
2. Problem analysis – further from SWOT and identified constraints, determining cause and effect relationships
3. Objective analysis – develop solutions from the identified problems and identify means to end relationships [We can begin this process and finalize before Inception meeting]
4. Strategy analysis identify and select the most appropriate strategy [Completed at Inception meetings]

Note: The log frame has already been developed and clearly the drought is identified problem, however, we need to agree on the above agenda before moving forward with planning and implementation.

Agro-ecological, socio-economic and environmental vulnerability by LLG

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | West New Britain | Talasea | Bali-Witu |
| Description of the areas | Coastal, wet-humid, mountainous with mostly secondary tropical rain forest | | |
| Soil type | Clay-like soils | | |
| Rainfall | Seasonal rainfall pattern. Wet season occurring in December o April on the North while South Coast from May to October. | | |
| Water resources | Agriculture is entirely rain-fed, natural rivers and streams. | | |
| Main staple crop | Sweet Potato | Sweet Potato | Sweet Potato |
| Secondary staple | Cassava | Cassava | Cassava, Banana |
| Tertiary staple | Banana | Banana | Sago and Singapore-Taro, Yam |
| Plantation crop | Oil Palm, Coconut | Oil Palm, Coconut | Coconut, Cocoa |
| Fresh produce | Aibika, Amaranthus spp, corn, ferns, kumu mosong, lowland pitpit, pumpkin tips, Snake bean, Karakap.  Fruits (Mandarins, bread fruit, Mango) and nuts (Chestnuts, galip) are seasonally available. | Aibika, Amaranthus spp, corn, ferns, kumu mosong, lowland pitpit, pumpkin tips, Snake bean, Karakap.  Fruits (Mandarins, bread fruit, Mango) and nuts (Chestnuts, galip) are seasonally available. | Aibika, spp, corn, ferns, kumu mosong, lowland pitpit, pumpkin tips, Valangur, Snake bean, Karakap, Aupa.  Fruits (Mandarins, bread fruit, Mango) and nuts (Chestnuts, galip) are seasonally available. |
| Major livestock farming | Cattle | Cattle | Nil |
| Smallholder livestock farming | Broiler Chicken farming | Village Chicken farming, pigs | Village Chicken Farming, pigs |
| Most favored protein source | Fish, chicken, pig | Fish, chicken, pig | Fish |
| Other resources | Seasonal availability of cray fish, eels, shells, wild animals and fruits & nuts. | | |
| Agro-industrial processing | Nil | | |
| Environmental threats and issues | Climate Change Effects such as drought, floods, strong winds & Rising Sea Level. | Climate Change Effects such as drought, floods, strong winds & Rising Sea Level. | Climate Change Effects such as drought, floods, strong winds & Rising Sea Level. |
| Reported disaster events | Drought | Drought | Drought |
| Current development projects/plans | Upgrading of Road & Bridges, Rural Electrification | Upgrading of Road & Bridges, Rural Electrification. New Oil Palm Estate developments | Infrastructures such as Health and Education facilities. |
| Past development projects | Hoskins Airport Renovations | Logging, Rubber, Coconut, Water & Sanitation | Infrastructures such as Health and Education facilities. |
| Active NGO’s or CBO’s | Live & Learn Environmental Education (LLEE) | Live & Learn Environmental Education (LLEE) | Live & Learn Environmental Education (LLEE) |
| Contact with PDAL advisor and DRDO | Mark Lebong – DAL Advisor; Leo Mapmani- Director, Disaster | Marshall Sangsangio- DAL District Coordinator | Johnathan Kuri – Manager, Bali-Witu LLG; Tonny Apamumu- DAL Officer, Bali-Bitu LLG |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

1. Bali-Witu LLG, WNBP

|  |  |
| --- | --- |
| Strengths   * Good Provincial, District & LLG support * Good working relationship with NARI. Currently IRC-Keravat helping in Establishment of multiplication plot in Kimbe. Planting materials can be easily access from there to Bali-Witu. * Regular travel by dinghies * Existing NGO (LLEE) implementing Climate Change Issues, build classrooms, etc. | Weaknesses   * Poor farming practices. * Unstable leadership in the communities. * Lack of commitment to Agriculture. * Lack of diverse crops for food security including sources of quality planting materials. |
| Opportunities   * Provincial Disaster Plans developed and Bali-Witu is one of the priority sites. * Potential for non-agricultural activities such as development of Marine resources. * Integration of food and cash crops. | Threats   * High cost of transport * Changes in Leadership with different plans * Vulnerability to food and water shortages during drought. * Vulnerability to Rising Sea Level. * Land degradation due to high population and continuous farming. |

Identifiable constraints and suggested interventions

The information in this table will assist us in moving towards development of the intervention strategies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| District/LLG | Identified constraints/problems associated with drought | Suggested interventions | Available technologies | Partner requirements |
| Bali-Witu LLG | Salt spray influenced by north-west and south-east winds. | \* Chart the calendar changes. Map out safe areas for relocation.  \* Identify and promote salt tolerant crops. | \* Staff Technical capacity.  \* Salt tolerant crops available | NARI, Provincial DAL, Provincial Disaster, LLG, NGOs |
|  | High tides | Relocate to higher altitude | Staff Technical capacity | Provincial Govt, LLG, NGOs |
|  | Water Shortage | Identify Water sources (steams, water wells, other catchments) and improve. | \* Staff Technical capacity.  \* Designs and materials. | NARI, Provincial DAL, Provincial Disaster, LLG, NGOs |
|  | Food Shortage | \* Establish multiplication plots for diverse drought tolerant crops.  \* Conduct trainings on food processing & storage.  \* Availability of Information on Climate Change or related. | \* Staff Technical capacity.  \* Planting materials, printing materials, etc | NARI, Provincial DAL, Provincial Disaster, LLG, NGOs |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Other needs for desktop study:

1. Provide available maps of the Districts and LLG’s

* Yet to obtain

1. Provide a rainfall, temperature and humidity chart for each District/LLG

* Yet to obtain

1. Make of list of known contacts and agents within the government, NGO or CBO networks
2. **West New Britain Provincial Administration**

|  |  |  |  |
| --- | --- | --- | --- |
| **Names** | **Designation** | **Phone Contacts** | **Emails Address** |
|  |  |  |  |
| Mark Lebong | Advisor – DAL | 79767489 | amlebongkbe@gmail.com |
| Leo Mapmani | Director Disaster | 71552546 | lmapmani@gmail.com |
| Johnathan Kuri | Manager- Bali/Vitu LLG | 72737827/79468222 |  |
| Enock Nukue | DAL Officer Bali/Vitu LLG | 79594378 |  |
| Tonny Apamumu | DAL Officer Bali/Vitu LLG |  |  |
| Marshall Sangsangio | DAL District Coordinator Talasea | 73629485 | msangsangio@gmail.com |

1. **NGO : Live & Learn Environmental Education (LLEE)**

* Mr Lazarus Peka **(Ph:** 72787982**; Email:** [lazarus.peka@livelearn.org](mailto:lazarus.peka@livelearn.org)**)**

Agro-ecological, socio-economic and environmental vulnerability by LLG

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Province** | **District** | **LLG** |
| ADD’s | Manus | Lorengau | Pobum |
| Description of the areas | Coastal, wet-humid, mountainous with mostly secondary tropical rain forest | | |
| Soil type | Clay, Alluvial soil types | | |
| Rainfall | Seasonal rainfall pattern… | | |
| Water resources | Agriculture is entirely rain-fed, natural rivers and streams | | |
| Main staple crop | Sago | Sago | Sago |
| Secondary staple | Cassava | Cassava | Cassava |
| Tertiary staple | Sweet potato | Sweet potato | Sweet potato, banana |
| Plantation crop | Coconut | Coconut | Coconut |
| Fresh produce | Aibika, Amaranthus spp, corn, ferns, kumu mosong, lowland pitpit, pumpkin tips, Valangur, Snake bean, Karakap | Aibika, Amaranthus spp, corn, ferns, kumu mosong, lowland pitpit, pumpkin tips, Valangur, Snake bean, Karakap | Aibika, Amaranthus spp, corn, ferns, kumu mosong, lowland pitpit, pumpkin tips, Valangur, Snake bean, Karakap |
| Major livestock farming | Nil | Nil | Nil |
| Smallholder livestock farming | Broiler Chicken farming | Village Chicken farming | Village Chicken Farming |
| Most favored protein source | Fish | Fish | Fish |
| Other resources | Seasonal availability of cray fish, eels, shells, wild animals and fruits & nuts. | | |
| Agro-industrial processing | Nil | | |
| Environmental threats and issues | Climate Change Effects such as drought, floods, strong winds & Rising Sea level | Climate Change Effects such as drought, floods, strong winds & Rising Sea Level. | Climate Change Effects such as drought, floods, strong winds & Rising Sea level. |
| Reported disaster events | Drought | Drought | Drought |
| Current development projects/plans | New Airport Development for easy accessibility | Logging, Rubber, Coconut, Water & Sanitation | Logging, Rubber, Water & Sanitation, Resource Centre Establishment, Healthy Island Concept. |
| Past development projects | New Market in Lorengau | Logging, Rubber, Coconut, Water & Sanitation | Logging, Rubber, Water & Sanitation, Resource Centre Establishment |
| Active NGO’s or CBO’s | Manus Support Community Development; Wildlife Conservation Society (WCS) | Manus Support Community Development; Wildlife Conservation Society (WCS) | Wildlife Conservation Society (WCS) |
| Contact with PDAL advisor and DRDO | Francis Ndrewei – DAL Advsor; Oma Wamu – DAL Officer; Luke Ndrasal – Environment & Climate Change Officer, Manus | Nil | Joseph Ndrasal- LLG Manager |
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SWOT analysis by District/LLG

For each District of LLG provide your best assessment of strengths, weaknesses, opportunities and threats in response to drought, their current agricultural practices, income earning options and the activity of development partners within communities. (Copy paste this table as needed.)

1. Pobuma LLG, Manus

|  |  |
| --- | --- |
| Strengths   * Good Provincial, District & LLG support * Good working relationship with NARI in the past and current. * NARI with DAL & Pobuma LLG established multiplication plot at Pelipowai. Land available for extension. * Representatives from all Wards and DAL, LLG trained by NARI. * Regular travel by dinghies * Existing NGO (WCS) implementing water projects and promoting Healthy Island concept. * Sago storage system for food security. | Weaknesses   * Poor farming practices. * Unstable leadership in the communities. * Lack of commitment to Agriculture. * Lack of diverse crops for food security including sources of quality planting materials. |
| Opportunities   * New Growth Centre Development in Pobuma LLG. * Rich in resources, potential for non-agricultural activities such as development of Marine resources. * Integration of food and cash crops. * Access from Manus can be by sea and road. * New wharf built in one of the LLG. | Threats   * High cost of transport * Changes in Leadership with different plans * Vulnerability to food and water shortages during drought. * Vulnerability to Rising Sea Level. * Land degradation due to impact of logging, and continuous farming in certain areas. * High population. * Pest & disease (eg betel nut disease) |

Identifiable constraints and suggested interventions

The information in this table will assist us in moving towards development of the intervention strategies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| District/LLG | Identified constraints/problems associated with drought | Suggested interventions | Available technologies | Partner requirements |
| Pobuma LLG | Salt spray with slight changes to North West and south East trade winds | \* Chart the calendar changes. Map out safe areas for relocation.  \* Identify and promote salt tolerant crops. | \* Staff Technical capacity.  \* Salt tolerant crops available | NARI, Provincial DAL, Provincial Disaster, LLG, NGOs |
|  | High tides | Relocate to higher altitude | Staff Technical capacity | Provincial Govt, LLG, NGOs |
|  | Water Shortage | Identify Water sources (steams, water wells, other catchments) and improve. | \* Staff Technical capacity.  \* Designs and materials. | NARI, Provincial DAL, Provincial Disaster, LLG, NGOs |
|  | Food Shortage | \* Establish multiplication plots for diverse drought tolerant crops.  \* Conduct trainings on food processing & storage.  \* Availability of Information on Climate Change or related. | \* Staff Technical capacity.  \* Planting materials, printing materials, etc | NARI, Provincial DAL, Provincial Disaster, LLG, NGOs |
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Other needs for desktop study:

1. Provide available maps of the Districts and LLG’s



1. Provide a rainfall, temperature and humidity chart for each District/LLG

* Yet to obtain

1. Make of list of known contacts and agents within the government, NGO or CBO networks
2. **Manus Provincial Administration**
3. Joe Ndrasal – Pobuma LLG Manager (Ph: 71793976)
4. Sidfrid Posangat – RDO Pobuma LLG
5. Francis Ndrewei – Provincial DPI Advisor
6. Oma Wamu – Manus Provincial DAL (Ph:73845635)
7. Luke Ndrasal – Environment & Climate Change

Officer

1. **NGO – Wildlife Conservation Society (WCS)**

* Yet to confirm the person in-charge.

1. Identify any critical issues associated with agriculture such as major anthropogenic environmental changes (e.g. mining, forestry, SABL, industrial development)

* Past and present Logging in Pobuma LLG and also currently plan for Rubber development in the area.