On the first Basic Income proposal
to conserve nature and combat climate change
on the largest tropical island on Earth

Basic Income for Nature and Climate

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Ari Prasojo, Femme Sihite, and Dhita Mutiara Nabella

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Research Center for Climate Change
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List of Acronyms

BI	Basic Income
BLT	*Bantuan Langsung Tunai* (Direct Cash Transfer)
BPS	*Badan Pusat Statistik* (Statistics Indonesia)
CBI	Conservation Basic Income
CCT	Conditional Cash Transfer
CO2e	Carbon dioxide equivalents
EICDA	Energy Innovation and Carbon Dividend
MtCO2e	Million metric tonnes of carbon dioxide equivalents
FCD	Forest Carbon Dividend
NDC	Nationally Determined Contribution
PES	Payment for Ecosystem Services
PFD	Permanent Fund Dividend
PKH	*Program Keluarga Harapan* (Family Hope Program)
OAP	*Orang Asli Papua* (Indigenous Papuan)
UBI	Universal Basic Income
UCB	Universal Child Benefit

Section 1

INTRODUCTION

1.1 Introduction

As we progress into the future with ever greater innovation and technologically advanced ways of living intended to make our lives easier, we as a society also face unprecedented and unavoidable global challenges. Ecological limits that have been associated with human progress and are imposed by drivers such as climate change and biodiversity loss illustrate key global challenges that create uncertainties regarding the future wellbeing of the great majority of humans. Against this backdrop, the idea of a basic income was not originally proposed as a tool to protect the environment, although we see increasing interest in linking a basic income with nature and climate (e.g., Boulanger, 2010; MacNeill and Vibert, 2019; Andersson, 2010; Howard et al., 2019).

Initially, the environmental protection afforded by a basic income was popular among the green movement (Birnbaum, 2010). It offers diverse views of how a basic income can play important roles in environmental conservation. One such role is the possibility for a basic income to enable new ways of living (Andersson, 2010). A basic income, for instance, would allow people to take up work outside the job market. Such work is deemed to be less environmentally damaging, with reduced dependency on employment contracts that have driven environmentally damaging forms of growth, and would increase cultural engagement in local activities (Van Parijs, 2010; Birnbaum, 2010). With this change, people would have greater control over their time, and the basic income would support the adoption of new work and productivity arrangements with a central focus on ecological and emotional values (Fitzpatrick, 2010).

It has also been suggested by detaching work and compensation from the conditions of job market participation, a basic income could have broad implications. Among other changes, it would challenge societies' preoccupation with buying or obtaining consumer goods, trigger structural changes in production and consumption, and reduce inequality, which would lower unnecessary consumption and ultimately reduce the environmental impact (Schachtscheider, 2012; MacNeill and Vibert, 2019). Most importantly, a basic income would remove the need for continuous economic growth and job creation that imposes an immense burden on the environment, thereby breaking the long-held connection between economic security and growth (Howard et al., 2019; Andersson, 2010).

The role of the basic income remains hypothetical despite considerable discussion on the topic. As we write this report, empirical studies showing the impact of a basic income on the environment are scarce. Studies that provide empirical evidence of the possible effect of the implementation of a basic income on the environment, such as the study by Ciepliski et al. (2020), have yet to be carried out and are especially necessary for the better understanding of the various – and often mixed – impacts of basic income on, for instance, emissions, working time, and income inequality. Discussions on the role of a basic income on the environment can also be found in the literature on growth and beyond growth. Empirical evidence on the impact of a basic income on the environment within what is often dubbed postproductivism, however, remains absent.

Moreover, references to a real, existing basic income or universal, unconditional cash transfers in general that are closely linked to nature and climate are very limited. None of the currently implemented social policies that incorporate elements of a basic income, such as the Permanent Fund Dividend in Alaska, the Compensatory Cash Transfer Program in Iran, and the Human Development Fund in Mongolia, share characteristics with a basic income for nature and climate, and they pose their own challenges to the implementation of a basic income scheme associated with this context. Recent proposals for an ecological basic income (such as that of Fletcher and Büscher, 2020), although they provide examples of a basic income for nature and climate by promoting biodiversity conservation through cash payments to individuals living in critical conservation areas, remain unclear in terms of how such schemes would be operationalized in practice and, at the same time, fulfill the universality and unconditionality characteristics of a basic income. Additionally, the source of funding for a basic income remains debatable, particularly in terms of ensuring sustainable funding for a lasting basic income (Tcherneva, 2012; Andersson, 2010; Van Parijs and Vanderborght, 2017).

This report proposes a basic income for nature and climate, which is arguably the first of its kind. In this proposal, we are interested in understanding the linkages among basic income, biodiversity and climate change and examine a context that demonstrates the matter to better understand these linkages. The context is *Tanah Papua*, or the Land of Papua, in Indonesian New Guinea. It is located on the world's largest tropical island (Gaveau et al., 2021) and endowed with the earth's richest biological diversity of flora and fauna (Cámara-Leret et al., 2020; Scholes and Laman, 2018; Marshall et al., 2007). The significance of *Tanah Papua* to global climate stability is breathtaking; a relatively small loss of its current forest cover would cancel out Indonesia's intended emission reductions from all of the country's carbon-emitting sectors. At the same time, *Tanah Papua* is the location of two provinces with the highest poverty rates in Indonesia. This overarching contradiction – that is, being poor in a land of rich importance to the climate and biological diversity at a time when the planet is burning and species are disappearing – is all the more reason why a basic income for nature and climate is worth exploring.

We organize this report as follows. In **Section 2**, we define what a basic income is in both its pure and contextualized forms before discussing the most pressing criteria for defining a basic income in regard to nature and climate. In **Section 3**, we present the background of *Tanah Papua* as a context for a basic income for nature and climate, especially its social, economic, biophysical and demographic backgrounds. In **Section 4**, we discuss two existing social protections in *Tanah Papua* for family and children and their limitations. Then, in **Section 5**, we propose the concept of a Forest Carbon Dividend, show the result of our simulations of the revenues generated and the dividends shared with all people residing on *Tanah Papua* as a basic income. In the final section, we conclude with several key takeaways.

Section 2

BASIC INCOME AND ITS FEATURES

2.1 What is a Basic Income?

A basic income is "a periodic cash payment unconditionally delivered to all on an individual basis, without means-test or work requirement", as defined by the Basic Income and Earth Network (BIEN), a global network of researchers and advocates of basic income. The definition of a basic income is indeed a subject of engaging discussion. This definition from the BIEN is a recent amendment of the original version posed in the 1980s (Van Parijs and Vanderborght, 2017). A closer examination of this definition shows that the defining features of a basic income are that it is paid regularly (i.e., it is not a one-off payment) using a medium of exchange that allows the recipient to decide how it is spent and used; it is paid to all without conditions related to level of income (means-test) or work requirements; and it is paid to individuals (not to households or villages, for instance).

It is noteworthy that what is not defined here is what is meant by the "basic" in "basic income", and this term has been highly debated. For this purpose, additional expressions – that is, "full" and "partial" basic income – have been proposed to refer to the different amounts of basic income provided for every individual. In the case of a partial basic income, the amount provided serves as a foundation meant to be supplemented with benefits or income from other sources.

2.2 Basic Income in Context

The defining features mentioned above help clarify what a basic income is. In practice, some of these features may or should be adjusted to better reflect a given context. This holds true for the basic income for nature and climate in *Tanah Papua* that is of interest to this report. For this purpose, we will illuminate the defining features of basic income in context related to (i) universality, (ii) what constitutes "basic" in a basic income, (iii) regularity of payment, and (iv) unconditionality. While the first three (universality, the definition of basic, and regularity) are features to be addressed here, further discussion of the unconditionality part is warranted due to the instrumental relationship between this feature and the definition of the basic income for nature and climate and will be discussed in the next section.

Universality. It is likely that a basic income is not paid to all people. Putting this into context, in contrast to common definitions, the basic income entitlement would be restricted to the residing population in *Tanah Papua*, including its indigenous people. In a practical sense, the residing population eligible for the basic income may further be defined as those living in the region for a certain length of time, a kind of statutory minimum length of residency requirement (e.g., Griffin, 2012) that is legally defined and agreed upon democratically. This more pragmatic definition of universality for basic income may be termed quasi-universal (Standing, 2019).

The definition of "basic" in "basic income". As previously mentioned, the definition of "basic" in "basic income" is contested, and it is important to discuss in context for any proposal of basic income. In defining "basic", there is a sense of providing a floor, a foundation for improving lives, that is, a minimum level of income, to justify describing a scheme as basic income. The specific amount required to meet that minimum level may of course depend on context. Among the advantages of defining the "basic" in basic income in this way is that any deviation from the original definition "may make strategic sense" (Van Parijs and Vanderborght, 2017: 10). Strategically, we think that this should help in defining "basic income" in the case of the basic income for nature and climate presented here and in addressing concerns about sustaining the capacity to fund a basic income in the long term, among others.

Regularity of payment. A basic income is paid to beneficiaries at regular intervals, such as monthly, and is not a one-time payment. In context, the interval for regular payment may also be extended – such as from every month to every year – for reasons related to how the funds for the basic income are managed and shared (for instance, as a social dividend to all members of society). To illustrate with a real-life example, the dividend from oil revenues, which is shared as basic income in Alaska, United States, is distributed every year (e.g., Kozminski and Jungho, 2017).

2.3 (Un)conditionality for Nature and Climate?

One of the features that distinguishes a basic income from other cash transfer programs is that it is unconditional. In the basic income literature, there are three important aspects related to unconditionality: The basic income is (1) strictly individual, (2) universal, and (3) obligation-free. Here, we focus on only the obligation-free aspect, which is relevant to the basic income for nature and climate. This aspect implies that a scheme places no demands on its recipients to perform any duties to retain eligibility for the basic income transfer (Van Parijs and Vanderborght, 2017).

While many of the existing basic income pilot programs and proposals are obligation-free (see Gentilini et al., 2020), we find that some forms of implicit conditioning may exist in basic income schemes. This is particularly applicable to discussions of a basic income associated with nature and climate. Simply labeling a basic income scheme with a term that implies some "conservation" element increases the likelihood that the recipients' behavior will be directed toward conservation activities, including those related to nature. The same likely applies to labeling a basic income scheme with "climate". The label signals the existence of an implicit contract between recipients and provider that guides how the transfer is used, hence introducing implicit conditionality (Pellerano and Barca, 2017).

While the basic income scheme should be unconditional by principle, the nature and climate context renders it implicitly conditioned on outcomes related to nature conservation or climate change. Therefore, a dilemma exists, and clarifying this dilemma is important because the contradictions between the importance of unconditionality in basic income and the existence of conditionality in a basic income scheme for nature and climate could lead to differences in impact and how a basic income for nature and climate would be put into practice. For this purpose, we select a number of proximate schemes that we consider similar to a basic income for nature and climate and later examine the existence of conditionality in each of these schemes. [1]

Figuring Out Unconditionality

To examine the existence of conditionality in basic income schemes, we construct a novel conditionality framework based on several conditionality dimensions. We later select a set of cases to illustrate this framework.[2] In their examination of conditionality in basic income, De Wispelaere and Stirton (2004) identify three dimensions of conditionality that we consider in our conditionality framework: *Strict/weak; ex ante/ex post, and narrow/broad.* Along different lines, Pellerano and Barca (2017) highlight four means of conditionality commonly found in cash transfer programs: Conditioning on access (i.e., *ex ante* conditionality); implicit conditioning; indirect conditioning; and explicit conditioning. We combine these dimensions and adopt a synthesized one. Our framework consists of two main dimensions:

(1) The *strict/weak* dimension, which indicates whether conditionality is strictly or weakly enforced in terms of its monitoring and assessment of beneficiary adherence; and

(2) The *ex ante/ex post* dimension, which refers to the set of criteria put in place to determine the eligibility status (*ex ante*) or to impose behavioral constraints for retaining eligibility (*ex post*).

Furthermore, the *strict/weak* dimension is defined based on the following three categories: (1) *explicit conditionality*, which is the strictest form of conditionality and imposes clear requirements or obligations that beneficiaries must fulfill; (2) *implicit/indirect conditionality,* which involves intrinsic requirements, obligations or complimentary policies that beneficiaries are encouraged to meet but that are not explicitly conveyed; and (3) *unconditional,* in which neither requirements nor obligations are imposed. We expect that with this framework, we will be able to visualize where the existing basic income schemes fall and hence their (un) conditionality characteristics.

Findings and Discussions

Table 2.1 presents the conditionality framework we constructed. This maps out the degree of conditionality, from explicit conditionality to unconditionality, as we applied it for the basic income scheme under study and similar schemes.

Table 2.1

Framework for conditionality and its findings

Schemes	Degree of Conditionality					
	Explicit Conditionality		Implicit/Indirect Conditionality		Unconditional (No Conditionality)	
	Ex ante	Ex post	Ex ante	Ex post	Ex ante	Ex post
Basic Income - Proposed						
Conservation Basic Income	●			●		
Indonesia - Forest Carbon Dividend				●	●	
US - ENergy Innovation & Carbon Dividend (EICDA)					●	●
Basic Income - Implemented						
US - Alaska Permanent Fund Dividend					●	●
US - Eastern Band of Cherokee Indians Casino Dividned	●					●
Iran - Compensatory Cash Transfer Program (temporary)					●	●
Mongolia - Human Development Fund (temporary)					●	●
Basic Income - Pilots						
Brazil - Renda Basica de Cidadania in the Municipal Government of Marica	●					●
Conditional Cash Trasnfer						
Payment for Environmental Services (PES)	●	●				

As provided, schemes are ideally unconditional in terms of both eligibility criteria (*ex ante*) and behavioral constraints (*ex post*). The mapping indeed shows that some of the selected basic income schemes are purely unconditional and are hence situated on the far right of the conditionality spectrum in the framework. This is particularly true for most of the currently implemented and pilot basic income schemes included here, such as the Permanent Fund Dividend in Alaska, United States (Widerquist and Howard, 2012); the Compensatory Cash Transfer Program in Iran (Tabatabai, 2012); the Human Development Fund in Mongolia (Yeung and Howes, 2015; Gentilini et al., 2020); and the *Renda Basica de Cidadania* in Brazil (Suplicy and Dallari, 2020; Gentilini et al., 2020).

Nonetheless, the framework also reveals that basic income schemes can fall into more than one conditionality type. For example, schemes are likely to be unconditional *ex ante* but remain conditional *ex post* or *vice versa*. The Eastern Band of Cherokee Indians Casino Dividend in the United States (Akee et al., 2010; Marinescu, 2018) has been considered an example of a basic income program. However, our mapping reveals that the scheme is not entirely unconditional. While it imposes no obligation for the recipients (no *ex post* conditionality), it specifically targets members of the Native American tribe only in the state of North Carolina (*ex ante* conditionality). In another case, the Forest Carbon Dividend discussed in this report for the provinces of Indonesian New Guinea provides dividend payment to all residents on the island (no *ex ante* conditioning). However, the concept of this scheme may feature a voluntary awareness campaign that promotes environmental conservation and potentially signals implicit requirements regarding the expected use of the transfer. Consequently, instead of being unconditional, the scheme exhibits some form of implicit *ex post* conditioning that transpires through its complementary awareness-raising activities.

While the mapping of the *ex ante* conditionality of the basic income schemes is fairly straightforward, the mapping of *ex post* conditionality is more refined and shows that two categories prevail: Implicit *ex post* conditionality and no *ex post* conditionality (unconditional). We find in our review that no basic income schemes entail explicit *ex post* conditioning, which is expected. Nonetheless, contrary to the unconditional characteristic of a basic income, we find that some of the basic income schemes have features that imply the existence of implicit *ex post* conditioning. This is especially the case for the basic income proposal, which is conservation oriented.

The Conservation Basic Income (CBI) scheme proposed by Fletcher and Büscher (2020) is considered an unconditional basic income. However, contrary to the authors' depiction of the scheme, it has some features that make it appear less than unconditional, as the authors claim. That is, the CBI (i) targets only members of groups living in conservation-critical areas, (ii) aims to combine the social

benefit of a UBI with a focus on environmental protection, as in the PES scheme, and (iii) intends to combine payments with other forms of community engagement to encourage a commitment to conservation. In this strict sense, the CBI is not unconditional and therefore does not constitute a basic income scheme.

Similarly, while the Forest Carbon Dividend proposal for *Tanah Papua* – the basic income scheme explored and presented in this report – does not target a particular population group or explicitly impose any obligation on its recipients, it incorporates a voluntary campaign that aims to raise conservation awareness among members of the community. Although payment is not made contingent upon campaign participation, the campaign may be seen as a nudging mechanism that signals the existence of implicit requirements regarding how the income transfer is expected to be used, that is, for nature and climate outcomes. Hence, it is an implicit condition.

Consequently, the existence of implicit conditioning creates contradictions between the importance of unconditionality in a basic income and the implicit conditionality of the existing basic income proposal for nature and climate. We see two potential reasons for the occurrence of such contradictions. First, there is a lack of understanding of the unconditionality feature of basic income, particularly when the scheme in question is nature- and climate-focused. A basic income may have the potential to contribute to the deceleration of environmental degradation. However, the importance of unconditionality in basic income schemes means that the priority of any basic income pilot or proposal should be to maintain the recipients' freedom to use the basic income in ways that best address their needs and capacities, regardless of the scheme's anticipated outcomes. The goal of meeting greater nature and climate targets through the basic income should not constrain this freedom. Equally important, basic income pilots and proposals should aim to maintain the programs' inclusiveness to respect the universality feature of a basic income.

Second, the existing basic income schemes for nature and climate may have overlooked a context in which it is possible to have a basic income with a focus on nature and climate while simultaneously maintaining its unconditionality (and universality). The closest example is the Forest Carbon Dividend in Papua. The entire island of Papua is home to vast forests and biodiversity, and residents' ways of living and livelihoods closely intersect with their environment. The provision of a basic income to the residents of the island may bring about potential benefits, both directly and indirectly, to the environment. As a result, the basic income for nature and climate does not necessarily have to be situated partway between conditionality and unconditionality. When applied in context, as in the case explored for *Tanah Papua*, a basic income for nature and climate can be entirely unconditional and universal.

Section 3

THE CONTEXT: *TANAH PAPUA*, INDONESIAN NEW GUINEA

3.1 Social Relevance and Planetary Significance

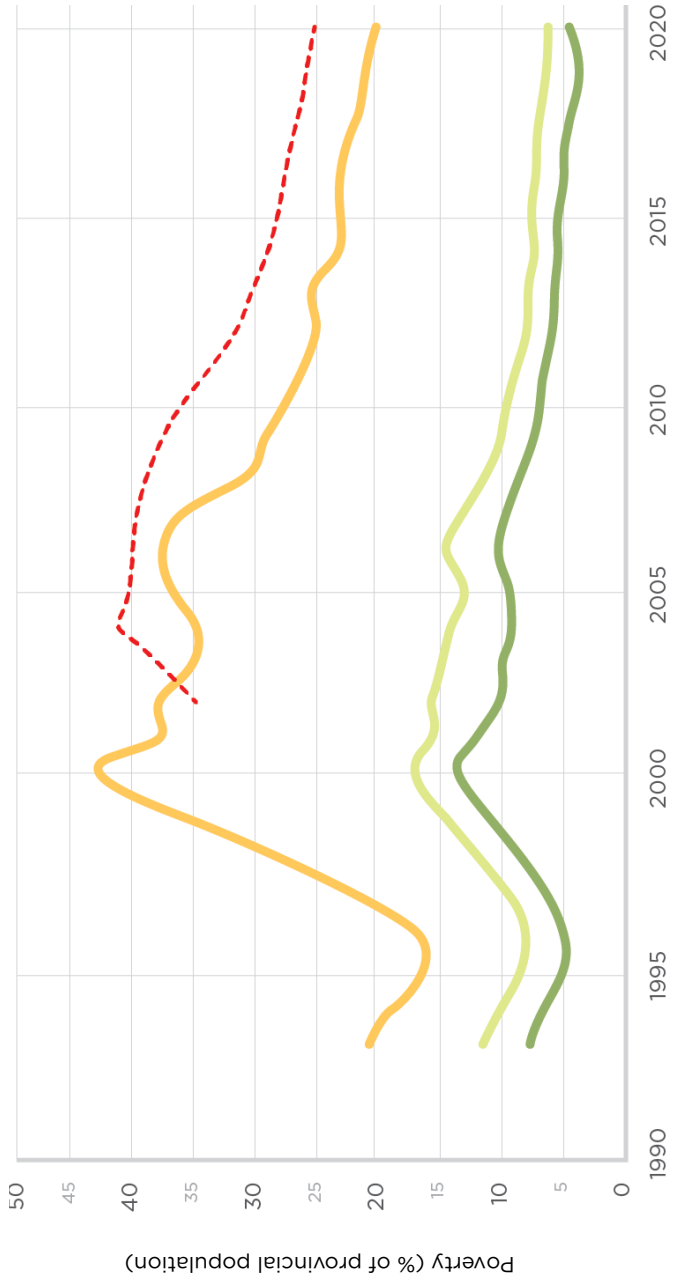
Tanah Papua comprises two provinces. Papua had a population of 3.38 million people in 2019, and West Papua had a population of 959,000 (BPS, 2019b). In this section, we provide some background related to poverty, basic services for health and education, and biophysical conditions deemed relevant to nature and climate.

Poverty

A broader picture of poverty in the provinces of *Tanah Papua* compared to other provinces can be presented by the poverty trend from the 1990s through 2020 (**Figure 3.1**). First, we can see that *Tanah Papua* has consistently had the highest proportion of poverty in Indonesia across time and administrations, with the latest observation showing that 1 out of 4 members of its population is considered poor. Second, the poverty level looms large, even compared to provinces outside of Java and Bali.

Third, shocks that hit all provinces have disproportionate effects on Papua and West Papua Provinces: (i) they result in a much greater increase in the proportion of poverty to nearly half of the population, as happened during the 1997 crisis and its aftermath, and (ii) Papua and West Papua recover from such shocks at a slower rate than other provinces (when data become available, we may expect to see a similar shock in the poverty trend in *Tanah Papua* as a result of the COVID-19 pandemic that started in 2020 and that will reverberate in the coming years). Fourth, at the same time, poverty reduction efforts have been taking place in *Tanah Papua*, although the proportion of people living in poverty remains high and is higher than that of the country's other provinces. A glance at the poverty rate over a longer time span appears to support this trend (as shown by the moving-average curve for the history of average poverty in the last 5 years).

Figure 3.1
The trend in poverty as a percentage of population at the provincial level, 1993-2000



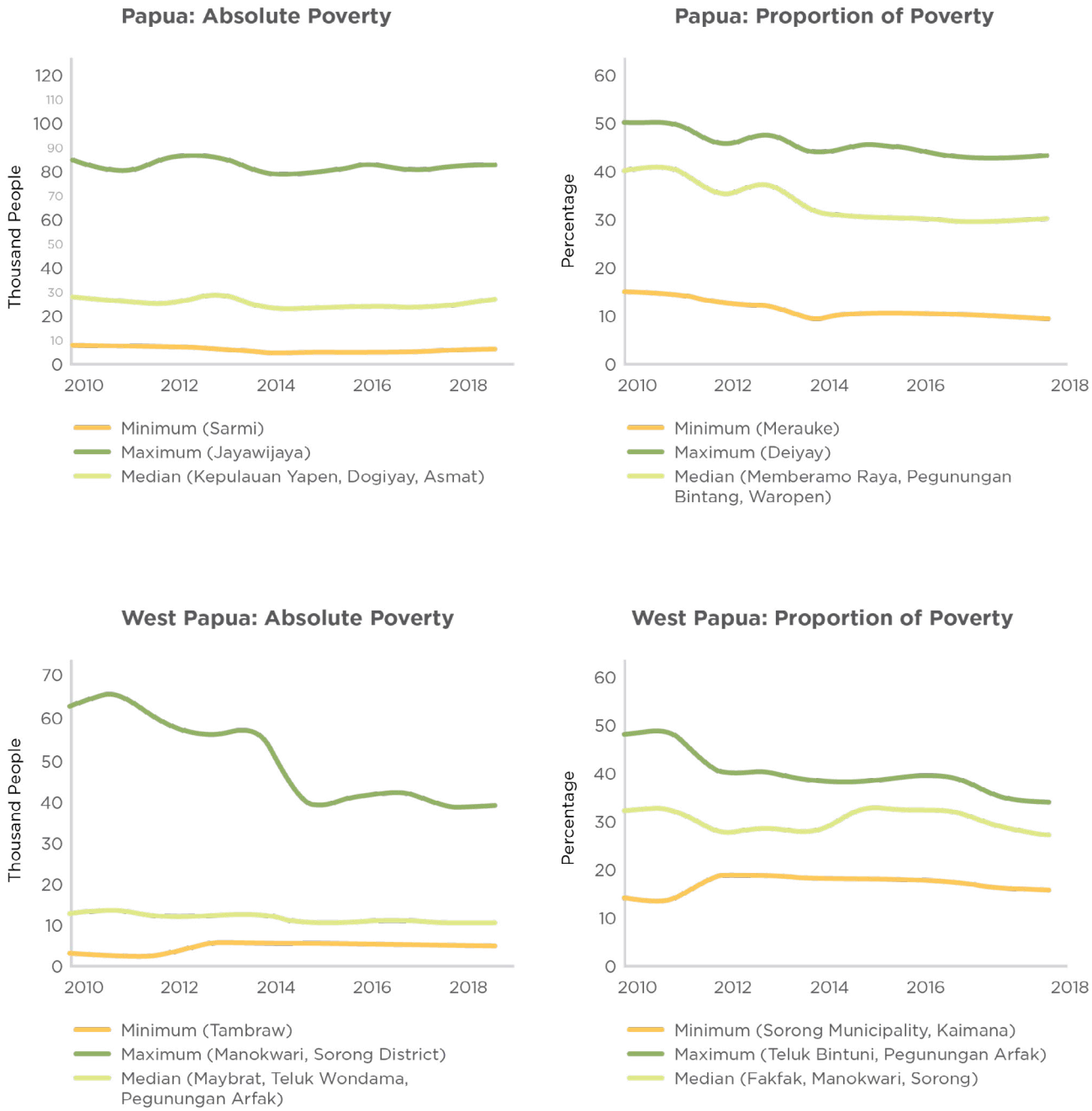
Notes: *Tanah Papua* became two provinces in 2003, and starting in 2006, its poverty statistics have been reported as two separate provinces. The observations are for 1993, 1996, and 2000-2020. See endnote for further supporting information on the method and data used.[3]

We turn now from a comparison of poverty across provinces to poverty within each province in *Tanah Papua* as a proportion of the provincial population. The median poverty rate in Papua tends to show a downward trend, while the median poverty rate in West Papua fluctuates, although it has moved within a similar range over the past 10 years. The maximum proportion of poverty has been declining in both provinces, with West Papua experiencing a steeper decline. The districts of Deiyai in Papua, in which 45-50% of the population is poor, and Teluk Bintuni and Pegunungan Arfak in West Papua (in which 38-48% of the population is poor and which alternate as the poorest districts in the province) have the highest proportions of poverty in *Tanah Papua*.

In the last ten years, in general, the median poverty rate in *Tanah Papua* has not changed significantly in terms of either absolute or proportional value. A decline in the median proportion of poverty, however, has been observed in the province of Papua. **Figure 3.2** shows poverty in *Tanah Papua* at the district and municipality levels. In terms of absolute poverty, the maximum absolute poverty in West Papua Province continues to decline, whereas that observed for Papua Province, Jayawijaya district (with more than 80,000 poor people), has generally remained the same. The minimum absolute poverty level, as represented by the districts of Sarmi in Papua and Tambrauw in West Papua, continues to show a similar steady trend in both provinces.

Figure 3.2

Poverty in *Tanah Papua* at the district and municipality levels: Absolute and proportional, 2010-2019



Source: Own figures. Derived from the Susenas survey (Badan Pusat Statistik, 2019). Notes: (1) Observations here refer to individual poverty in each district/municipality and hence its descriptive statistics; (2) Observations for the districts of Manokwari Selatan and Pegunungan Arfak, both in West Papua Province, started in 2014, and as a result, observations prior to that year apply only to existing jurisdictions.

Education and Health

The education and health status of both provinces in *Tanah Papua* remains low relative to the rest of the country (Huwae and Timmer, 2019). In the province of Papua, the percentage of the population aged 7-24 years who were still in school in 2019 was 61.90%. The remaining 16.02% and 22.08% have never attended school and no longer go to school, respectively (BPS, 2019b). In terms of health, for every 1,000 live births, 27 newborn babies die in the first month of life, and 115 die before celebrating their fifth birthday. In West Papua, educational and health conditions are more problematic. Seventy-five percent of its population aged of 7-24 years old is still in school (BPS, 2019). Child mortality is high at 85-100 out of 1000 live births, while the maternal death rate is three times higher than Indonesia's average. In terms of health access, one doctor serves between 2,000 and 2,300 people, and access to health care is mainly concentrated in urban areas (Rees et al., 2008).

Nature and Climate

The large scale and richness of Papuan ecosystems are highly relevant to climate and biodiversity. Their immense significance for global climate change is straightforward. According to a WRI Indonesia analysis (unpublished), a reduction of Papua's forest cover to 70%, from the current forest cover of 87% (40 million Ha) of the total area, would release 3.5 Gt of CO2e. This is a huge emission; it accounts for 1.2 times Indonesia's business-as-usual projected emission in 2030. This amount is equivalent to 3.2 times all of the country's intended emission reductions from all sectors, as presented in the Nationally Determined Contribution (NDC) that the country submitted to the United Nations Framework Convention on Climate Change (The Government of Indonesia, 2016).

A closer look at the forests of *Tanah Papua* reveals importance of the Papuan forest to the global climate. For instance, mangrove forests provide a wide range of beneficial ecosystem services, such as carbon storage. The carbon-rich mangroves of Papua are a large carbon sink that makes their conservation essential for global climate change mitigation. The plant and biomass pools of Papuan mangroves have among the highest carbon values in Indonesia (Murdiyarso et al., 2015).

Papua, which is on the world's largest tropical island, New Guinea, is the location of a wide array of ecosystem types, ranging from reefs to highest mountains, and some of the best-preserved ecosystems on the planet can be found there. In the view of Marshall (2007: 755), these facts in part explain "why this is an area of such high biodiversity and a major center of endemism in many distinct taxonomic groups". The diversity of Papua's terrestrial ecosystems is mainly attributable to

its wide altitudinal range (Marshall, 2007). Papua is part of New Guinea Island, which, as the latest scientific evidence regarding vascular plants suggests, is the most floristically diverse island in the world (Cámara-Leret et al., 2020). Similar rich biological diversity can also be found among endemic fauna, especially bird species, including birds of paradise (Marshall and Beehler, 2007). Unfortunately, the forests and ecosystems in both Papua and West Papua Provinces are under constant and increasing threat from industrial palm oil and pulpwood plantations, mining, and infrastructure development (e.g., Sloan et al., 2019).

3.2 Demographic Status and Projection

Population projection is an estimation of future demographic characteristics. To project the population of *Tanah Papua*, we rely on historical data and assumptions for the future.[4] This effort relies on three demographic variables, namely, birth, death, and migration (Bappenas, BPS, and UNFPA, 2018). Most of the published population projections are available only at the provincial level, although several provinces have projected populations down to the district and municipality levels. At the district/municipality level, such projections are useful to provide an overview of future demands for food, water, energy, and public facilities, such as health and education facilities. Population projections are also useful for estimating the number of beneficiaries and the costs of social protection schemes, including the basic income for nature and climate.

The population projections for the two provinces of *Tanah Papua* – West Papua and Papua – are available only at the provincial level. We apply a cohort component method that requires historical information on demographic parameters at the district and municipality levels for population projections; however, this information has been limited.[5] We illustrate here some population pyramids for the selected year. Additionally, to complete our demographic observations, we present findings from a qualitative analysis using the cases of the Tambrauw and Sorong districts, chosen because of their proportions of indigenous Papuans.

Projected Population in West Papua Province

By 2025, the population of West Papua is projected to reach approximately 1.1 million. The city of Sorong will have the highest population (295,911), while the lowest population will be located in the Arfak Mountains district (32,671). The population projection for the province shows an extreme result for the Tambrauw district. While 2010 and 2015 saw the lowest populations in the district, the population is projected to grow, and by 2025, the district is projected to be number seven of the 13 districts/municipalities in the province.

Tambrauw observed significant population growth during the period of 2010-2015. Its population growth reached 17.08% per year – significantly higher than the annual population growth of other districts/municipalities at the time (1.40-3.37% per year). This high population growth could be associated with its upgraded status from a subdistrict to district in 2008. In 2013, the Tambrauw area expanded significantly as a result of the merging of some subdistricts from the Manokwari and Sorong districts. It also attracted domestic migrants, who sought to take advantage of the district's economic opportunities.

Population pyramids (see **Figure 3.3**) represent population projections at the district/municipality level by age and sex composition. In general, the 2015-2025 period does not show any changes in pyramid shape; however, changes are observed in terms of numbers. This is largely because the method assumes that no demographic variables affect population growth. The typical pyramid shape suggests that the populations in most districts in West Papua are relatively young. Although the productive age group (between 15 and 64 years) is proportionally dominant, the young population group (0-9 years) is also well represented.

Moreover, an expansive pyramid is depicted for the districts of Raja Ampat, Teluk Wondama, and South Sorong. The 0-4 years age group represents the largest segment of the population, and proportions tend to decline steadily as age increases. The municipality of Sorong, which is the capital of the province, has a large proportion of people in the primary productive age (20-34 years), mainly due to the influence of within-country migration and rapid economic development. In contrast, a smaller proportion of the productive age group is found in the districts of Sorong and Teluk Bintuni.

In the districts of Manokwari, South Manokwari, Arfak Mountains, and Maybrat, the young group (0-9 years) accounts for a small proportion of the population, and the population shows an aging trend. In comparison, the population structure of Tambrauw Regency is very different from that of other districts in the province; here, young people (0-14 years) account for a substantial proportion of the population, while the proportion of the productive-age population is large but not dominant, indicating a growing population.

Projected Population of Papua Province

Based on the same period of 2015-2025, the population in Papua Province shows a similar trend in terms of age and sex composition. In 2015, the population in each district was less than 300,000 people, with the province's capital showing the largest population. It is projected that by 2025, Jayapura will still have the

largest population. There were 283,700 people living in the capital of the province in 2015. By 2025, the number is expected to increase to 319,700. Moreover, the Asmat district was inhabited by 139,000 people, but that number is expected to reach 155,000 by 2025. Other highly populated districts include Asmat, Paniai, and Lanny Jaya.

If one compares the expansive and constructive types of population pyramids, only a couple of districts belong to the constructive category. These are Jayawijaya, Lanny Jaya, Membaramo, Nduga, Tolikara, Yakuhimo, and Yalimo. As an illustration, the proportion of the 0- to 5-year age group in Lany Jaya, a district in mountainous area, is lower than the proportion of the 5- to 9-year age group, but higher than that of the 15- to 19-year age group. Moreover, the proportion of the population comprised by the 20- to 29-year age group population is decreasing significantly, while the proportion of the 30- to 44-year age group is increasing and that of the 45-year and older group is declining significantly.

In comparison, Asmat and Paniai are examples of districts with expansive population pyramids. They are located at low and high altitudes. The population pyramid of the Asmat district shows a solid expansive pattern in which the 0- to 4-year age group comprises the greatest portion, and the share of the population decreases proportionally with increasing age. Moreover, the proportion of the 5- to 9-year age group is significantly lower than that of the 0- to 4-year age group. This can be explained by the low survival of children in these age groups. A similar pattern is found in Paniai, but the proportion of the 5- to 19-year age group tends to be stable. In general, the expansive population pyramid indicates a high birth rate and low life expectancy.

Some Plausible Factors Underlying the Demographic Changes in *Tanah Papua*

The high population growth in *Tanah Papua* is generally influenced by a large influx of migrants, especially in its urban areas. The large influx of migrants has greatly affected the composition of the population in terms of not only age and sex but education, occupation, and ethnicity. However, it should also be noted that the birth rate in *Tanah Papua* remains high.

Migration in Papua began with the transmigration program during the New Order era. The Indonesian Ministry of Transmigration recorded that 3,968 households entered Papua as transmigrants in 1979 (Hadimadja et al., 1993). Five years later, the number of transmigrants jumped to 137,800 families, most of whom came from Java, Buton, Bugis and Makassar (Ardanareswari, 2019). In addition to the

transmigration program, mining, plantations, and the development of new areas also drove migration to *Tanah Papua*. In West Papua, oil and gas activities, as well as oil palm plantations in Sorong Regency, triggered migration into this area (Romdiati et al., 2020). In hinterland areas, migration is mainly induced by territorial splits, which create new centers that later serve as district capitals. These emerging new urban areas attract newcomers, notably for trading activities.

The Papua Special Autonomy Law gives privileges to subnational governments in *Tanah Papua* to split their territories without the need to completely fulfill the basic requirements for forming new subdistricts that are commonly applied to other regions in Indonesia. The latest regulation, Government Regulation Number 17 of 2018 concerning the Formation of Districts, requests that the basic requirements for district formation be fulfilled. These include minimums for the number of families in each village, area size, number of villages, and number of years of establishment. Several districts that did not meet these requirements had differences between the population numbers in the existing records and the numbers that were empirically observed in Papua. There is a likelihood that the reported populations were marked up to meet the eligibility requirements for a territorial split, although further research is needed to verify this. Another possible driver of territorial splits is the anticipation of village funds (*Dana Desa* or *Dana Kampung*) that are transferred from the central government to villages in *Tanah Papua*. Territorial splits have been proposed in many areas, including in Tambrauw district, one of the case studies investigated (Romdiati et al., 2020).

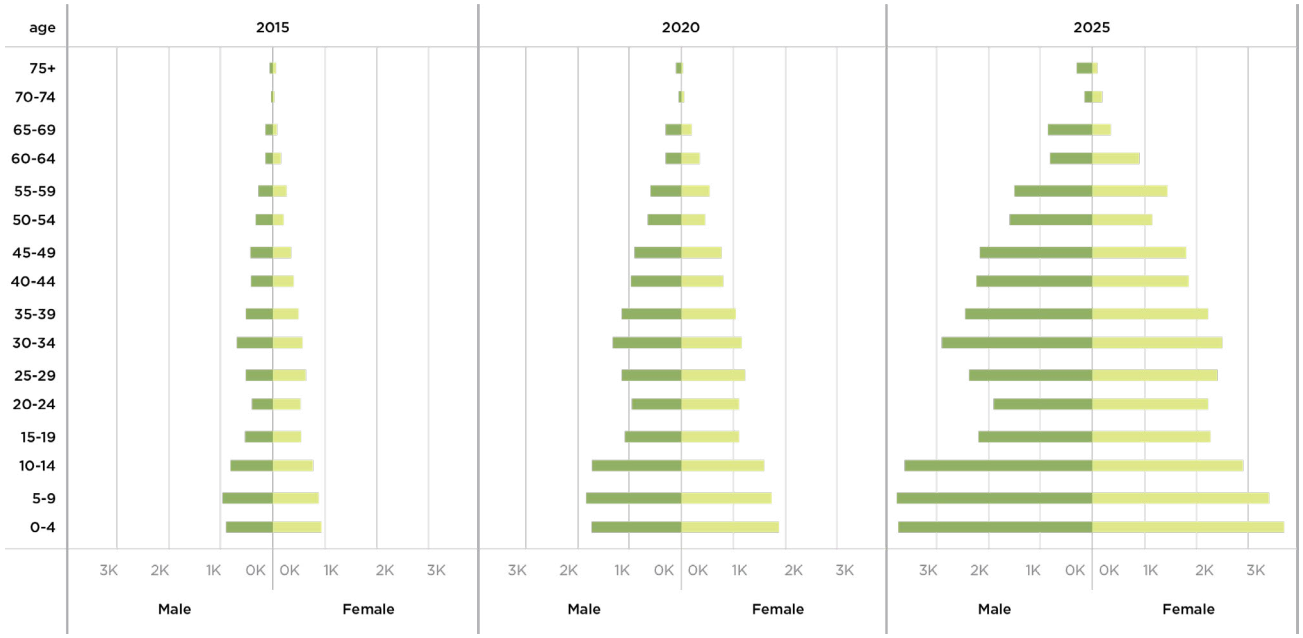
Moreover, the high birth rate has contributed to the high population in *Tanah Papua*. Romdiati et al. (2020) note that a native Papuan woman in Tambrauw has an average of between 3 and 4 children born alive. This number is the same as the live birth rate for non-native Papuans, although number and proportion of live births to nonnative Papuans remain comparably small (7.2%).

The high number of children, both boys and girls, in native Papuan communities can be associated with sociocultural and economic drivers. Boys are culturally valued as successors of the clan and heirs of *Tanah Ulayat* (*ulayat*=land) – more boys mean more clan members. Meanwhile, in Papuan culture, girls have high value in terms of marital traditions. The bride price (mas kawin) of Papuan women is extremely high. Papuan women are also viewed as economic assets due to their labor on farms. Farming activities in Papua often involve more women than men. The challenge, now and then, is that demographic changes in *Tanah Papua* tend to marginalize native Papuans in their own homeland. The threats posed by poor education (most Papuans have only an elementary education) and a high proportion of poverty (the highest in Indonesia), among other factors, likely make native Papuans unable to compete with incoming migrants.

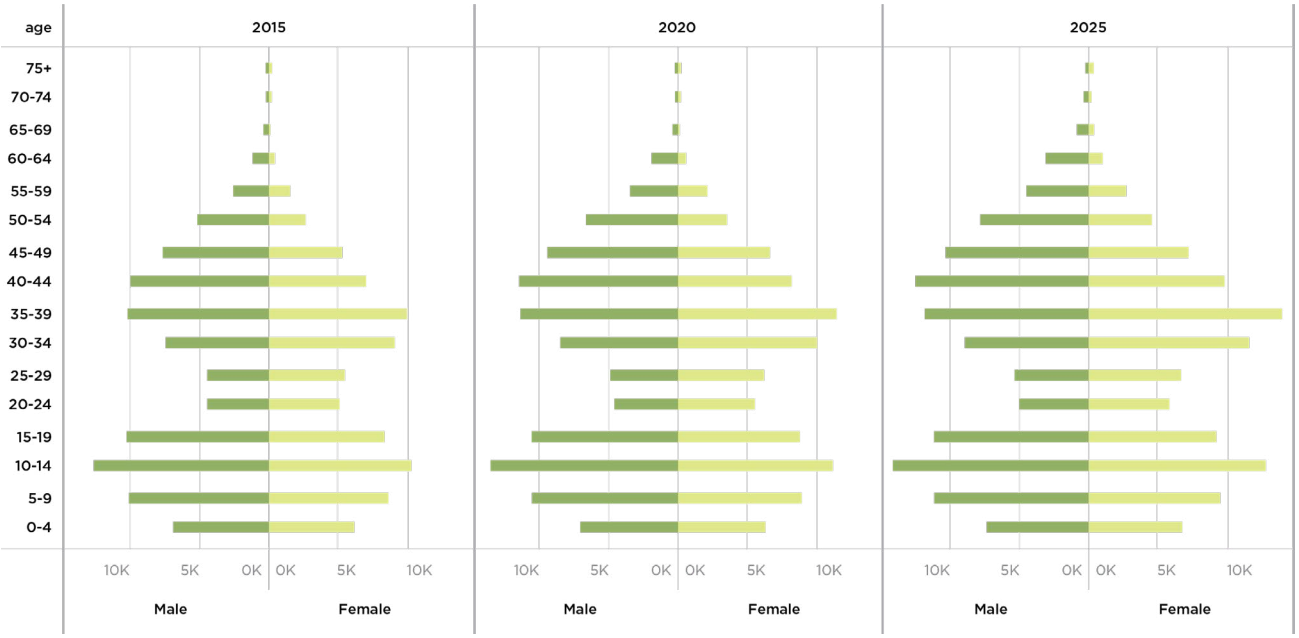
Figure 3.3

Population projection pyramids for 2015, 2020 and 2025 for selected districts in Papua and West Papua Provinces

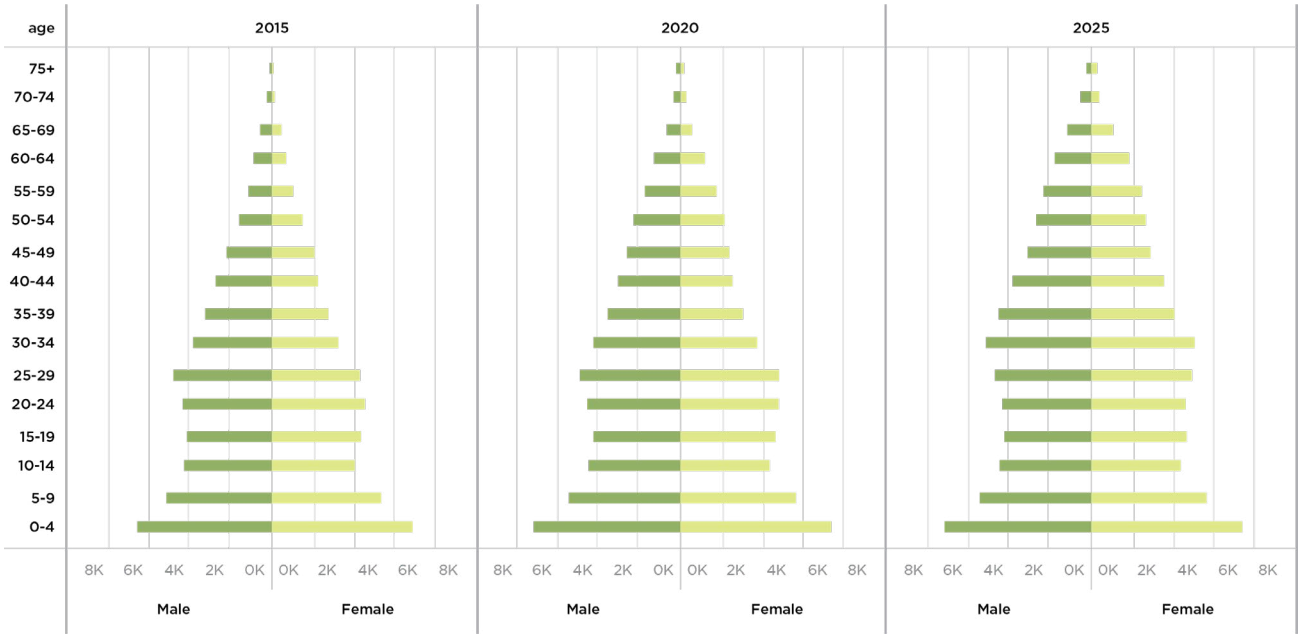
Panel A. Tambrauw (West Papua Province)



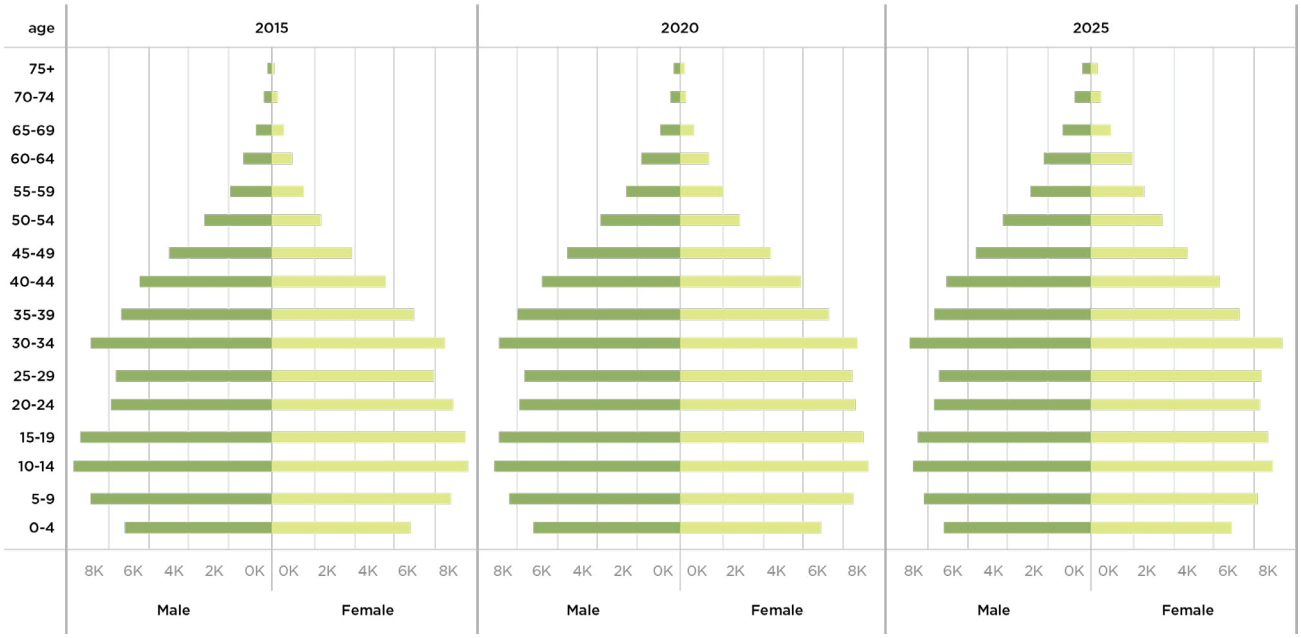
Panel B. Lanny Jaya (Papua Province)



Panel C. Asmat (Papua Province)



Panel D. Paniai (Papua Province)



Source: Own figures. Notes: Number of males and number of females for each age group by year (see notes on the method in the text). Lanny Jaya Asmat and Paniai are districts participating in the Universal Child Grant trial in Papua Province.

Section 4

A TALE OF TWO CASES: SOCIAL PROTECTION IN *TANAH PAPUA*

4.1 Targeting The Family: The Conditional PKH Program

Efforts to alleviate poverty have been proposed and implemented under various schemes. One such effort is the implementation of conditional cash transfer (CCT) schemes in several developing countries (Fernald et al., 2008; Rasella et al., 2013; Lim et al., 2010). It provides direct cash assistance to poor families with conditionalities generally aimed at increasing investment in human development, such as sending children to school and encouraging regular visits to health centers (Rasella et al., 2013; Leroy et al., 2009). Indonesia implemented a CCT scheme through its flagship Family Hope Program (*Program Keluarga Harapan*/PKH), which evolved from its previous program, Unconditional Cash Transfer (BLT), back in 2005. Although the BLT and PKH share similar targeting approaches for the same population group, namely, the poor, the latter has shifted from an unconditional scheme to a conditional scheme. This is illustrated by the fact that there are no obligations imposed on BLT beneficiaries, whereas the receipt of a PKH cash transfer is conditional upon the recipient's fulfillment of education and health obligations. The impact of the PKH certainly differs according to a variety of factors, including geographic location, employment sector, parental education level, relative income level, and gender. These factors can be both a support and a barrier to the success of the PKH as it is implemented (Alatas, 2011; Febriany et al., 2011).

This report examines the current implementation of the PKH in *Tanah Papua*. We are particularly interested in how PKH social assistance is being distributed in light of circumstances unique to *Tanah Papua*, the nature of the program's design, and how these factors likely affect PKH distribution.[6]

The motivations for this interest are twofold. First, research that critically considers the PKH beyond its implementation remains lacking; most of the research conducted in *Tanah Papua* has focused on evaluating the PKH within the PKH framework itself, and evaluations are limited to certain districts or cities (TNP2K, 2012; Hadna and Dyah, 2017; Lobo, 2019). Second, there is a need to view schemes such as the PKH from a broader perspective of social assistance schemes, including those that are unconditional and nontargeted (Gentilini et al., 2020). This is of high relevance because the possibility of making such schemes policies in *Tanah Papua* is being explored. Currently, a categorical basic income trial is being implemented in the form of universal child benefits (UCB). The UCB has been tested in Papua since 2018 as a strategic program of the provincial government. The main objective of the UCB program is to reduce poverty and improve health outcomes among children aged 0-4 years (UNICEF and ODI, 2020). In addition to this scheme, a discussion has begun to explore the possibilities of an unconditional and nontargeted scheme under the so-called Forest Carbon Dividend, which aims to improve climate and biodiversity outcomes in *Tanah Papua* (see **Section 2.3**).

As anticipated, we found in this study that the geographic and topographical conditions of *Tanah Papua* create a number of obstacles in reaching the people who are eligible for PKH cash transfers and in ensuring that the PKH reaches its intended beneficiaries. Settlements of beneficiaries are scattered throughout mountains and valleys, on islands along the coast, and in remote forest areas. The availability and quality of transportation facilities are not evenly distributed; better infrastructure is available in provincial capitals (Jayapura, Manokwari) and the centers of certain districts than in other areas. Long distances, short distances with difficult terrain due to the aforementioned natural conditions, and the dispersion of the population lead to increased difficulties in reaching recipients and increase the time and cost that the program requires.

We also found another obstacle related to the condition of health and education facilities and the availability of health and teaching personnel, which are limited or even absent in *Tanah Papua*. As a conditional cash social assistance program, the PKH inherently requires the fulfillment of obligations related to the use of health services, education services, and social welfare by PKH beneficiaries. Such conditionalities are attached to the PKH, and they are considered fulfilled if beneficiaries visit health and education facilities. Long distances and the limited availability of health and education facilities increase the costs of utilizing these services and the time required to seek them out. If recipients do not meet these requirements, PKH social assistance is suspended or even stopped (that is, PKH membership is revoked).

Based on these findings, we can offer some reflections. First, taken as a whole, geographic/topographical interdependence and infrastructure (comprising both physical and nonphysical facilities) imply monetary and nonmonetary costs that are likely to be greater than those captured in the assessment of program implementation thus far. Second, these geographic/topographical constraints and implications have indeed been raised in previous evaluations of the PKH and similar programs, such as in the PNPM/RESPEK assessment of districts with topographical difficulties such as Yahukimo, Dogiyai, and Teluk Bintuni (The World Bank, 2015). However, these constraints persist and recur. Third, mentoring and companion-based (*berbasis pendamping*) program implementation are inherent to the PKH design. In that light, as the program encounters the special and unique conditions of *Tanah Papua*, these attributes become inherent limitations of the PKH, ones that can be overcome in a partial or limited manner, but not fully.

Since 2016, PKH distribution has shifted from cash through PT. Pos Indonesia to become noncash scheme through the State-Owned Bank Association (Himbara); assistance is disbursed through a Prosperous Family Card (KKS) or savings book. This transition intends to increase the effectiveness and efficiency of PKH distribution in terms of targets, timeliness, amounts, and administration. This

banking distribution is also expected to encourage financial inclusion in *Tanah Papua*. Although BNI, Bank Mandiri, and BRI are affiliated with the Himbara banks, most PKH cash assistance is disbursed through BRI. However, Himbara banks are not yet adequately distributed throughout Papua and West Papua Provinces and tend to be located in urban areas or regional centers, making it difficult to distribute PKH social assistance to beneficiaries in remote villages or areas with limited access to banks and other supporting facilities. This has contributed to increased transportation costs for the withdrawal of PKH social assistance among beneficiaries. It is not uncommon for these costs to be greater than the amount of social assistance that the beneficiaries receive. This may explain why PKH beneficiaries residing in rural areas tend to not withdraw PKH social assistance if doing so requires travel to distant and poorly accessible cities; elderly beneficiaries in particular are increasingly unlikely to withdraw PKH funds.

We envision a number of plausible responses to these barriers with different possible effects. First, Himbara banks could be asked to make greater effort to cooperate with beneficiaries throughout the PKH distribution process, such as by providing dedicated staff to handle specific PKH distribution assignments, not multiple assignments, as is current practice in Biak, Papua Province. Second, the direct channeling of PKH funds to communities or groups, not individuals, is a possibility and has been exercised by BRI in Wasior in the Teluk Wondama district of West Papua. By regulation, this kind of distribution is possible and needs to be coordinated with one of the Himbara banks. Third, distribution efforts could involve and collaborate with local banks, such as Bank Papua, given their presence and wider availability of outlets and facilities in situ. This possibility should expand the scope for disbursement and the inclusion of PKH beneficiaries.

A fourth proposal, which is a more fundamental response, is to change the PKH distribution process to bypass intermediaries at various stages so that the funds go directly to the beneficiaries. An electronic wallet or e-wallet could be considered for this purpose. Electronic wallets have become common practice and are part of the domestic flow of money in the Bank Indonesia Real-time Integrated Foreign Exchange Monitoring Information System (SIMODIS) (Bank Indonesia, 2018). Successful cash transfer through e-wallets has been carried out in collaboration with telecommunications facility providers, such as Safaricom M-PESA mobile money in Kenya (Suri and William, 2016).

4.2 Targeting Children: Universal Child Benefits

A UCB is a grant paid to all children periodically and unconditionally. Because its beneficiaries are all within a certain age group, a UCB constitutes a categorical basic income. UCBs have been determined to play an important role in children's development, specifically in helping to combat child poverty and improve child health and wellbeing (Shaefer et al., 2018; Brownell et al., 2016; Butcher, 2017; Matthews, 2016; Muennig et al., 2016; Halpern-Meekin et al., 2015; Wolfe et al., 2012; Akee et al., 2010), although the matter has been inconsiderably discussed.

Although no nationwide UCB has been applied in Indonesia, there are currently two pilot projects administered in Aceh Province and Papua Province. The latter is the Program *Bangga Papua* (henceforth, The Programme), which is administered in the Asmat, Paniai, and Lanny Jaya districts and aims to improve the nutritional status of children. The Programme gives each child aged 0-4 years who is an indigenous Papuan (Orang Asli Papua, OAP) a monthly transfer of Rp200,000 ($15). Obtaining citizenship documentation in the form of identification numbers (Nomor Induk Kependudukan, NIK), birth certificates, and bank accounts (Bank Papua, on behalf of one of the parents, usually the mother) is a prerequisite for eligibility for The Programme. The Programme is regulated under the Governor of Papua Regulation number 23/2018 on Building Prosperous Papuan Generations and Families/*Bangun Generasi dan Keluarga Papua Sejahtera*.

In this part of the report, we aim to share the current progress of The Programme and discuss issues and findings regarding its implementation and financing from the UCB perspective. These issues are embedded in the unique characteristics of *Tanah Papua* on a number of fronts – from its ethnic composition and the Special Autonomy Status and its law (the Otsus Law) to its history, current socioeconomic situation, and the global significance of its nature and forests to biodiversity and climate. The main perspectives we want to address are fourfold: The universality, conditionality, benefit distribution, and financing of The Programme. Later, we compare the current scheme with the proposed scheme in terms of financing a basic income for children.[7]

We take three steps in assessing and comparing UCBs in Papua, Indonesia. First, we consider the concept of a UCB and select its universal and unconditional characteristics as the main variables for the purpose of assessing and making comparisons. In our view, these characteristics are the most relevant to the Papua case. In this step, we also assess the funding of the UCB. Second, we address the sources of the variable data for all the methods we used. Third, we reflect on the data and the findings regarding the characteristics and financing of the existing UCB and compare it with the proposed social protection scheme in Papua.

Universality

The Programme uses age, ethnicity, and geography to target beneficiaries and does not consider factors related to income or poverty, signifying that The Programme is universal but categorical. The eligible beneficiaries are indigenous Papuans (OAPs) aged 0-4 years who reside in Papua Province. Indigenous Papuans, as defined for the purposes of The Programme, meet one of the following requirements: i) both parents are OAPs or ii) one parents is an OAP (The Provincial Government of Papua, 2018).

The pilot program covered 31,917 children in 2019 (The Provincial Government of Papua, 2020). According to the projected population of Papua described in another section of this report (**Section 4.3**), the 2019 projected population of children aged 0-4 years in all pilot districts is 42,021. The ethnicity composition data are limited, but according to Ananta (2016), an estimated 95% of the residents in the three pilot districts are OAPs, while the numbers are significantly lower in nonpilot districts, such as Jayapura and Keerom. With this information, the current coverage rate of The Programme is approximately 75% of all children aged 0-4 years in the pilot districts.

However, we can report that significant numbers of eligible children are likely to not receive benefits due to several factors. First, there are differences in the responses from the government (The Provincial Government of Papua, 2020). Better responses have been shown to lead to higher numbers of children covered. Second, many eligible children have not obtained legal citizenship documentation (NIK or birth certificate), a precondition of The Programme, and some parents refuse to register due to religious views and other political motivations.

The findings and issues discussed suggest that targeting is plausible but might be ineffective. It is plausible due to the Otsus fund regulation, which prioritizes OAPs (The Provincial Government of Papua, 2013). However, the methods used to identify OAPs remain unclear, as existing programs apply different, yet equally legitimate, methods. For example, the regulation identifies people of Melanesian origin and others that have been recognized as OAPs by the Papuan Indigenous Community (the definition used in the Otsus Law), those who have been residing in Papua for at least 35 years (the definition used by Indonesia Statistics/BPS), and those with at least one parent who is an is OAP (the definition used by The Programme). The use of broad identification methods will include more children who are identified as OAPs and will have a positive impact on the coverage rate. However, issues arise for eligible OAPs not residing in Papua as they are eliminated from The Programme but are entitled to Otsus funds (which provide funding for The Programme).

In terms of effectiveness, although such methods may meet the universality criterion of The Programme or are nearly universal, their targeting might be ineffective because it requires additional administrative costs for targeting, verification, and periodic census, which could be reallocated elsewhere (Hanna and Alken, 2018; Mkandawire, 2005; Gwatkin, 2000; Baker and Grosh, 1994). Given the restrictions of the Otsus fund, additional sources of funding should be sought to increase the likelihood that The Programme is universally available to children.

Conditionality

Generally, if the parents and eligible children have both citizenship documentation and bank accounts, they are eligible to receive obligation-free child benefits. If they do not have such documentation, then they can register for the documentation and open a bank account. The provincial government claims that the administrative process has significantly helped the province register more residents for citizenship documentation, resulting in the issuance of 28,409 new identification numbers (NIKs) by mid-2019 (The Provincial Government of Papua, 2020).

We identify some issues related to conditionality. Parents' refusal to obtain the necessary documentation to meet the precondition prevents their children from receiving the benefits. Moreover, lack of access to infrastructure and transportation has hindered parents' efforts to obtain the required documentation, as the related offices are far away, and traveling there is expensive. Based on these findings, we conclude that The Programme is *de facto* unconditional upon the obtainment of documentation and the completion of the registration process. Conditionalities, when they are present, are akin to formal conditions for administrative purposes.

These preconditions increase the amount of time required to execute The Programme, as registration and verification need to take place prior to enrollment. At the same time, however, removing these conditions is apparently not an option, as it would prevent the government from verifying data. One benefit of the conditionality of The Programme is its positive outcomes in terms of civil registration and demographic records. Such documents are critical to ensure the rights of citizens – an entitlement that goes beyond merely receiving child benefits. In this sense, the conditionality may be sensible.

Nonetheless, the conditionality of The Programme is highly related to its universality, specifically in regard to coverage. Children of parents who refuse to meet the preconditions are excluded because of nonfulfillment of the documentation conditionality. In addition, geographical and infrastructure concerns may further decrease the universality of The Programme, even among OAPs.

Timeframe and Benefit Distribution

Cash is transferred into the bank accounts of the parents every 6 months in a lump sum of Rp1,200,000 ($90) in a scheduled payment that requires the physical presence of the parents during withdrawal (The Provincial Government of Papua, 2020). In 2019, a delay occurred when a transfer that was scheduled for June was paid a few months later, in September (KOMPAK and BaKTI, 2019). This indicates that the provincial government faces challenges in distributing benefits. In addition to geographical issues, the availability of bank branches and supporting infrastructure is limited, which makes it costly to withdraw cash. Moreover, beneficiaries are unfamiliar with banking processes, such as saving or withdrawing money. As a result, there is a need to familiarize the beneficiaries with banking facilities.

Moreover, the timing of benefit distribution faces a number of challenges. First, the timeframe for benefit transfer is not ideal if the goal of the benefits is to improve the nutritional status of children. The ideal timeframe should be monthly. Nonetheless, this remains reasonable considering all the issues and challenges faced. Second, delays in transfer could impact the effectiveness of The Programme. Third, benefit distribution is costly for both the beneficiaries and The Programme due to administrative costs, the long verification process, the nonflexible schedule, and opportunity costs for the beneficiaries. Better payment methods should be explored and considered.

Financing

The Programme is funded solely by the special autonomy or Otsus fund (The Provincial Government of Papua, 2018). In 2019, exactly 1.26% of the total budget of Rp5.8 trillion ($417 million) was transferred to beneficiaries (The Provincial Government of Papua, 2020). This transfer accounts for 0.004% of Papua's provincial GDP. Unfortunately, no transfer occurred in 2020 due to the shifting of financial resources to the 2020 National Sports Event (PON 2020) that Papua will host. The allocation of special autonomous funds has become increasingly strict, and no funds have been set aside for The Programme (The Provincial Government of Papua, 2020).

The existing financing arrangement warrants two considerations. First, regarding financial sustainability, the current arrangement leaves The Programme's large funding needs to be met by a single source, which is problematic, especially when The Programme is intended to be expanded to the entire province. The Otsus fund is set to end in 2021 (The Government of Indonesia, 2001). Although there is a possibility of an extension, the fund may have to end in the near future, and when it does, it is likely that there will be no sustained source of funds for The Programme.

Second, the PON 2020 sporting event has been deemed an emerging priority of the provincial government, which will weaken its political commitment to investing in children. As a result, it is both advisable and necessary for The Programme to seek alternative sources of funding. One potential source is funding through a nature and climate scheme such as the Forest Carbon Dividend discussed in other sections. In the following section, we compare this proposed scheme to one that is already in place.

4.3 Comparing Current and Proposed Programs

In **Table 4.1**, we present the current and estimated expenditure and the coverage rate of the scheme, as currently applied in 3 pilot districts, and a similar scheme called the Child Basic Income (Child BI). The amount transferred to the Child BI from the Forest Carbon Dividend varies by district and year depending on the forest carbon stock and carbon revenues generated by each district. Estimated spending is derived from the simulation of the Forest Carbon Dividend in *Tanah Papua*, as highlighted in **Section 5.3**.

Table 4.1

Comparing The Programme and Child Basic Income in terms of funding source, expenditure, coverage, and estimated coverage

Child Benefit Schemes	Source(s) of Fund	Spending (in Papua Province)		Coverage and Estimated Coverage (2019 Population Projection)			
		Current (2019)		Estimated		Number (0-4 years)	% of Population (0-4 years)
		Nominal	% of Papua GDP	Nominal	% of Papua GDP		
The Programme (Universal Child Grant)	Special Autonomy (Otsus) Funds	Rp74.2 billion ($5.2 milion)	0,004	Rp96.8 billion ($6.8 milion)	0,005	31,917	75% (of the pilot districts population)
Child Basic Income	Forest Carbon Dividend	-	-	Rp544 billion ($38.4 milion)	0.2	42,021	100% (of the pilot districts population)

Source: Own table. The UCG data are derived from a report delivered by a representative of the provincial government during a focus group discussion, while the CBI data are based on the authors' calculation (see Mumbunan and Tazkiana, 2021). Notes: UCB is currently being piloted only in Papua Province.

From a funding perspective, the Forest Carbon Dividend is likely to be more sustainable than the Otsus fund. The latter is, by regulation, set to end in the near future, and there are unforeseen emerging priorities that will shift monies from the Otsus fund. The dividend, on the other hand, can last for as long as the forests are protected. From a spending perspective, the Forest Carbon Dividend is expected to generate more than five times the estimated allocation of the Otsus fund if full coverage of all eligible children is assumed. As a result, the amount funneled to the Child BI could be substantially larger. In terms of coverage, a Forest Carbon Dividend-funded Child BI aims to include all children in the pilot districts since it is, by design, a universal scheme.

Section 5

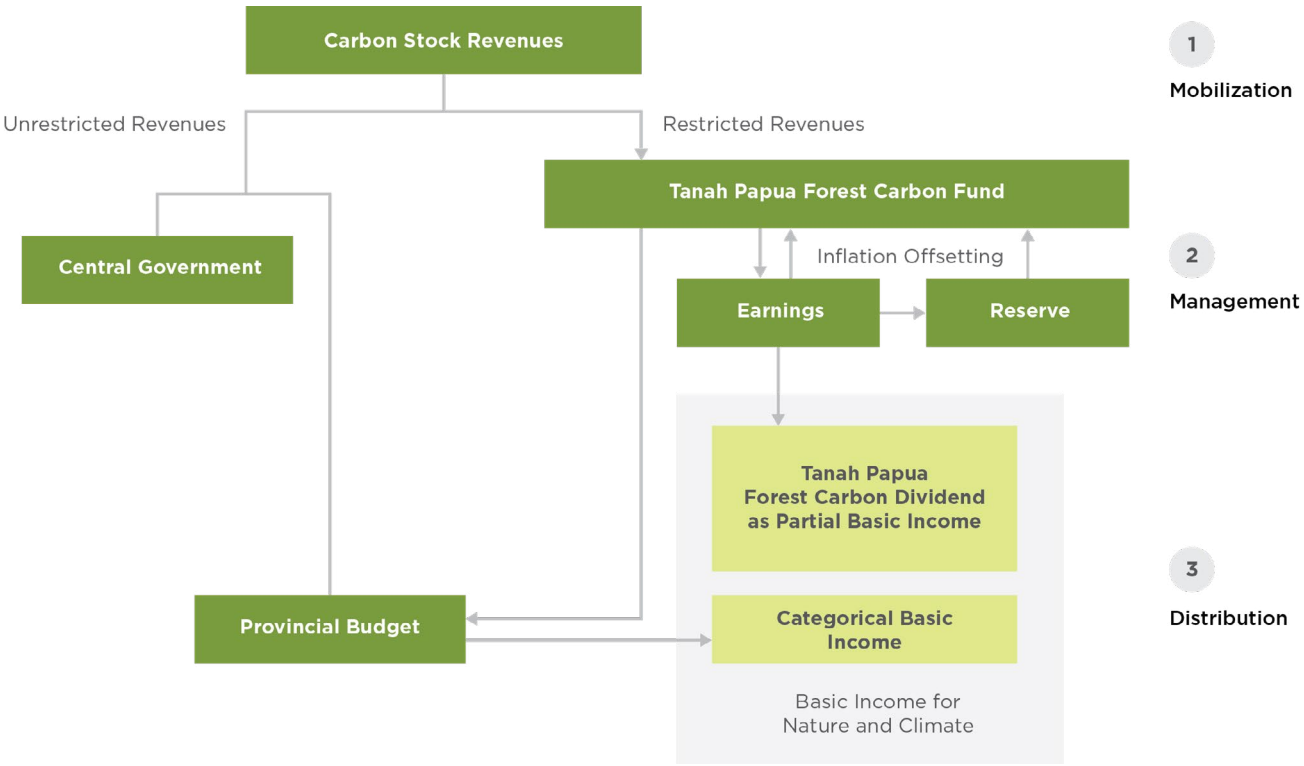
BASIC INCOME FOR NATURE AND CLIMATE

5.1 The Concept: A Forest Carbon DIvidend

The idea of a basic income for nature and climate, as imagined in this report, is closely associated with the notion of a Forest Carbon Dividend. Here, we present the Forest Carbon Dividend as an inseparable element of a larger, integrated concept, along with the concept itself. The concept was introduced and developed by the lead author of this report (Sonny Mumbunan). The larger concept comprises elements of (1) financial resource mobilization, (2) financial resource management, and (3) financial resource distribution. *Tanah Papua*, an Indonesian expression for the Land of Papua that refers to the two provinces of Papua and West Papua, is the context within which the concept operates.

Resource mobilization largely entails mobilizing resources generated by putting a value on forest carbon stocks. Resource management, on the other hand, relates to managing the mobilized financial resources through a *Forest Carbon Fund* arrangement, while resource distribution pertains to the Forest Carbon Dividend, which represents the idea of a basic income being developed here. Needless to say, we are fully aware of the conceptual differences between a basic income and a dividend-based scheme (Zelleke, 2012; Howard and Widerquist, 2012; Ghatak and Muralidharan, 2020). The concept is a hierarchical flow of these elements, and as presented in **Figure 5.1**, the Forest Carbon Dividend represents the downstream resource distribution part of the concept. We will elaborate on these elements and the Forest Carbon Dividend in the following section.

Figure 5.1
Elaboration of the Forest Carbon Dividend as part of an integrated concept



Source: Unpublished notes. An early version was presented in Mumbunan (2019).

Mobilizing Financial Resources from Forest Carbon Stock Valuation

The valuation of forest carbon stock involves calculating the stock, pricing it, and, for the purpose of mobilizing financial resources, determining the sources of payment for the quantified and valued carbon stock. The calculation of carbon stock can entail the quantification of below-ground and above-ground stocks, for example, by using carbon stock based on the land cover categories of primary and secondary forests, as developed by the Ministry of Environment and Forestry. The price of carbon stock can be based on existing ways of pricing carbon stock, as established in similar carbon initiatives.

To put the way that carbon is priced in appropriate perspective, under the partnership between the Central African Forest Initiative (CAFI) and the Government of Norway, a carbon price floor of $10 is set for each verified and certified ton of carbon dioxide in Gabon. This price floor is expected to reward past performance and

future results for the absorption of carbon dioxide by natural forests, in addition to reducing greenhouse gas emissions resulting from deforestation and degradation. In Indonesia, performance-based payments for the reduction of emissions from deforestation under bilateral and multilateral arrangements, such as the Norway-Indonesia Partnership and Green Climate Fund, have set a lower carbon price floor of $5 per ton of carbon dioxide.[8]

Table 5.1

Stated carbon prices for results-based payments for reduced forest carbon emissions and captured forest carbon stock

Schemes	Scope	Carbon price
The Norway-CAFI Partnership	Emission reduction and carbon capture	$10/ton of CO2
The Norway-Indonesia Partnership	Emission reduction	$5/ton of CO2
Indonesia Green Climate Fund	Emission reduction	$5/ton of CO2

As highlighted above, payment for quantified, certified, and valued carbon stock can stem from various sources, including both bilateral and multilateral arrangements. One potential candidate is results-based payments under the Indonesia-Norway REDD+ Partnership. Other complementary alternatives involve the inclusion of debt-financing schemes, such as intact rainforest bonds or mangrove bonds whose principal and coupons can be delivered in the form of valued carbon stock, in portfolio management (in light of a wider discussion on a basic income for nature and climate, further co-financing possibilities beyond those pointed out here are provided in a later section).

Managing Financial Resources Supporting and Surrounding the *Tanah Papua* Forest Carbon Fund

The revenues created by forest carbon stock valuation are split into two kinds of allocations: (1) restricted revenues and (2) unrestricted revenues. The *restricted revenues* will contribute to a permanent fund scheme, namely, the *Tanah Papua* Forest Carbon Fund. As the name implies, this allocation represents a fraction of the revenue that is restricted to the permanent endowment fund. The *unrestricted revenues*, on the other hand, will be funneled to the central and provincial government as revenue, with the division between the two levels of government determined by political decision.

Moreover, the Forest Carbon Fund will be managed to create earnings. The total net earnings will subsequently be placed into three different accounts: (1) the Forest Carbon Dividend; (2) an inflation offset account; and (3) an earning reserve. As expected, the dividend – which consists of a real return that is separated from the principal – will be further distributed. The net earnings of the inflation offset account, on the other hand, can be reinvested into the Forest Carbon Fund's principal and not appropriated. This fraction should ideally be sufficient to offset the effect of inflation on the principal. Similar practices are found in other cases (see, e.g., O'Brien and Olson, 1990, for the Alaska Permanent Fund). The third account, the earning reserve fund, can be appropriated or reallocated in the future as the principal of the Forest Carbon Fund. To varying degrees, both the inflation offset account and the earning reserve account can serve as stabilization funds to cover budget deficits arising from price changes or emerging budgetary priorities of the provinces in *Tanah Papua*, which may affect long-term earnings.

Some reflections on the macrofinancial aspects of managing resources can be warranted. The idea related to the dynamics of financing sources proposed here differs from those presented in other proposals. While it shares similar concerns regarding risk management and risk exposure to ensure the sustainability of financing basic income, it differs in some ways from, for instance, a universal basic share (as put forward in Ghatak and Muralidharan, 2020).

The proposed Forest Carbon Fund manages dividends as income portfolios alongside other stabilizers for inflation. As such, it is directly linked to changes and inflated revenue sources as part of investment strategy, which creates a more stable flow of dividends and thus addresses financial risk management more organically. This differs from the universal basic share scheme in the sense that the funding for the latter is pegged to a specific portion of the GDP (nominal, aggregate or per capita) over time and accordingly makes no assumption about revenue sources. Dividing a pool of (carbon) revenues in this way would likely dilute the returns at the collective and individual levels alike (see Cummine, 2012). As described above, the Forest Carbon Dividend intends to share only real returns, preserving principal revenues for reinvestment.

Sharing Financial Resources through Dividends as a Basic Income

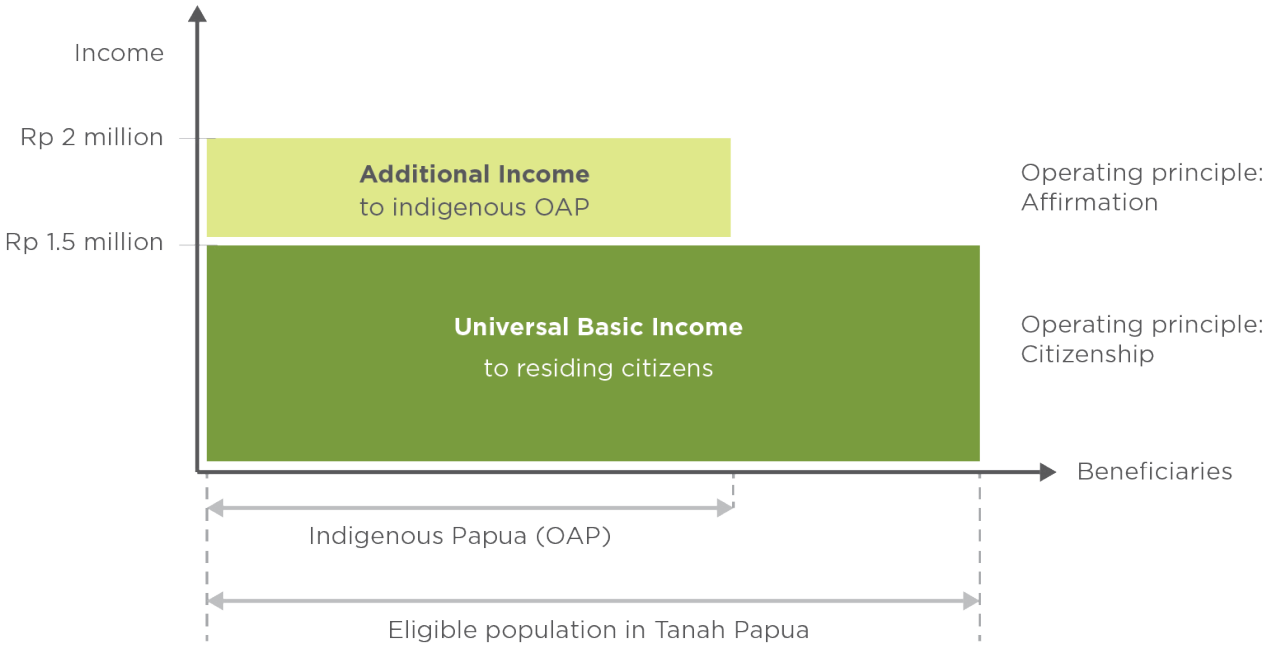
The Forest Carbon Dividend is a dividend that is shared as a cash (or its equivalent) payment with all qualified residents of *Tanah Papua*. The dividend resembles the idea of a basic income being developed here. Conceptually, it constitutes a partial basic income as it does not fully cover the entire basic income of the recipient;

the capacity to cover the basic per capita income depends on the pool of funds available to be shared for every member of the population.

Before moving forward, some descriptions regarding the Forest Carbon Dividend's criteria of universality and unconditionality are needed. As mentioned, the Forest Carbon Dividend will be shared with all qualifying residents in *Tanah Papua*, making it a universal scheme. The nature and climate significance of the entirety of *Tanah Papua* justifies this universality. The amount of basic income to be provided is grounded on both citizenship and affirmative principles. According to the citizenship principle, all qualified residing populations will receive a certain amount of the Forest Carbon Dividend in accordance with their right to a guaranteed income. In addition, affirmative principles are applied that provide indigenous Papuans with an additional Forest Carbon Dividend. Indigenous people own land and are entitled to their indigenous rights.

Figure 5.2

Beneficiary arrangements for a basic income in *Tanah Papua*



Source: S. Mumbunan (unpublished note)

Regarding the unconditionality criteria, it is possible – and desirable – to establish an unconditional basic income while at the same time expecting a certain degree of nature and climate outcomes. Although this may like a contradictory conflation of unconditionality (which is the defining feature of basic income) and conditionality (in terms of an anticipated outcome for nature and climate), the Forest Carbon Dividend for Papua allows for that possibility.

The conditionality part, of course, should not necessarily be required to be pure. We can relax the defining criterion for basic income without losing our overall perspective on why a basic income exists in the first place. Implicit conditioning, such as a nudging mechanism in the form of campaigns regarding the expected use of the income transfer for nature- and climate-related purposes, should be allowed (Maitri and Mumbunan, 2021).

Further Notes on the Use of Dividends from Forests to Provide a Basic Income

Indigenous people, customary ownership, and carbon rights

We have touched on the use of the affirmation principle to designate indigenous people in *Tanah Papua* as basic income beneficiaries, in addition to the citizenship principle that makes the basic income applicable to all residents. Indigenous people in *Tanah Papua* are associated with land ownership, and in terms of basic income, this association is instrumental for reasons related to (i) ownership and (ii) the distribution of benefits for nature and climate. Customary land ownership defines who owns services provided by their land and forest ecosystems, including carbon stock, and who should be the beneficiaries of the carbon stock (and further climate and nature benefits) provided by the maintenance of indigenous lands and forests.

In *Tanah Papua, adat* land ownership is based on clan membership. Clans are part of a larger tribe, and membership is passed down for generations following ancestral heritage and is defined by natural markers, such as trees and rivers (e.g., Dewi, 2016). Indigenous Papuans had a crucial emotional attachment to clan lands as the land gives them "a very strong sense of place, origin and continuity" (De Vries, 2012, p. 6). Emerging new relationships in agricultural production, however, have begun to introduce economic and cultural changes to indigenous land ownership and rights in some areas in *Tanah Papua* (Savitri, 2020). The tenurial system in *Tanah Papua* may complicate notions of carbon rights, especially given the presence of private (clan) and communal tenurial rights, neither of which are transferable rights, although it is possible for others to gain permission to use indigenous land (Savitri, 2021).

Tanah Papua is endowed with rich rainforests and biodiversity with which its population has closely interacted for generations. Despite recent changes that may have affected their relationships with nature, in general, there appears to be little need to condition the basic income we are discussing here on protecting forests and biological diversity for either the indigenous Papuans or the population at large. The provision of a basic income for the population residing in Papua will likely benefit the environment, while its absence may potentially put pressures on the environment. A look at the trend in how the deforestation of indigenous land for large-scale plantations is initiated (see, e.g., Obidzinski et al., 2012), a lack of income and deprivation of the livelihood of the indigenous population will likely cause some of its members to give up *adat* land at a very low price. In a recent case in point, a company paid tribe members a mere $8 per hectare for the loss of trees on land that was converted into oil palm plantations (Amindoni and Henschke, 2020).

Combined forms and sources of financing for a basic income

The Forest Carbon Dividend that we developed here depends on an available pool of funds and is not likely to cover the entire basic income – hence, it provides a *partial* basic income. For this reason, a Forest Carbon Dividend-like basic income can complement a categorical basic income that covers a population category, such as a specific age group, such as the recently piloted universal child benefit in the province of Papua (Sihite and Mumbunan, 2021). Such categorical basic income schemes can be funded by a provincial budget whose revenues come from various streams. These revenue streams include, but should not be limited to, the Special Autonomy Fund (*Dana Otonomi Khusus*), ecological fiscal transfers (such as general purpose transfers and other transfers allocated in ways that consider the forest cover of the jurisdiction), reallocated nonmerit subsidies, own-source revenues, rents from natural resources (such as oil in Teluk Bintuni, West Papua), part of debt for nature swaps and, of course, portions of the unrestricted forest carbon revenues. These various revenue streams highlight co-funding possibilities within Indonesia's public finance system and Papua's special autonomy arrangements.

5.2 Simulations

The provinces of Papua and West Papua account for one-third of Indonesia's forest.[9] This carbon-dense forest is home to Asia's largest tropical rainforests and one of the most biodiverse ecosystems on Earth, and it plays an important role as a source of livelihood for the Papuan people. Despite this potential, as **Section 3.1** shows, poverty is still present in both provinces.

We investigate this paradox and attempt to approach the issue by exploring a possible scheme that intends to address the significance of Papuan forest while at the same time tackling poverty and providing social protection for the people. The scheme is the Forest Carbon Dividend, which is a dividend from earnings generated from a portion of forest carbon revenues and shared with all residents of Papua with no conditions attached (see **Section 2.3**). In other words, it is a basic income for nature and climate.

We perform a simulation to determine whether Papua and West Papua's carbon-dense forest could potentially help the government address current poverty issues through a Forest Carbon Dividend and, if so, to what extent.[10] In approaching this investigation, two questions guide us. First, how much revenue could forest carbon in Papua and West Papua create? Second, considering local perspectives more closely, how could a basic income be used as a fund distribution scheme? We hope that the answers to this question contribute to a new discourse the Forest Carbon Dividend as a potential solution to tackle poverty, and as the same time, halt forest degradation in *Tanah Papua*.

What Are Carbon Stocks, Where Are They, and How Many Are There?

Approximately 83% of Papua and West Papua lands are covered by forest. Primary dry land forest accounts for the largest area (47%), followed by secondary dry land forest (17%) and primary swamp forest (12%). Additionally, the total above-ground and below-ground carbon stocks of the different land cover types range between 12.6 and 3.427 MtC for Papua and between 11.6 and 951 MtC for West Papua based on a carbon stock estimate that recognizes possible variability among different land cover types. For both provinces, the largest carbon stocks (3.427 MtC for Papua and 951 MtC for West Papua) are found in primary swamp forest, where the most extensive peatland areas are. This implies that primary dry land forests comprise the largest proportion of the land area (57%) but store only 38% of the total carbon stock, while primary swamp forests, which account for only approximately 15% of the land, contain 46% of the total carbon stock. On the other hand, secondary mangrove forest contributes the least carbon stock in the two provinces (12.6 Mt C in Papua and 11.6 MtC in West Papua).

Looking more closely at the districts and municipalities (**Figure 5.3**), we find that Mamberamo Raya contributes the largest forest carbon stock in Papua province, followed by Mappi, Asmat, Boven Digoel, and Mimika, whereas Teluk Bintuni contributes the highest carbon stock in West Papua, followed by Kaimana, Fakfak, South Sorong and Tambrauw. Their carbon stocks range between 2.7 and 854.9

MtC, with an average of 224.8 MtC. Mamberamo Raya outnumbers all districts due to its comparably large forest area. Unsurprisingly, municipalities such as Jayapura and Sorong have the lowest carbon stock given their low forest cover. Furthermore, the simulation demonstrates the significant role of peatlands in this carbon stock appraisal. We find that peatland stores much more carbon per unit area than mineral land. In the Mappi district, for instance, the estimated stock not including peat soil carbon is 261 MtC, and this number triples when peat soil is included (795.5 MtC). This can also be seen in Teluk Bintuni, where the greatest amount of peatsoil carbon in West Papua Province is situated.

5.3 Estimated Carbon Revenues and Dividend

We assume that carbon (CO2e) per hectare per year is priced at $5 on the carbon market to estimate potential revenues.[11] We reveal that the total revenue obtained from the carbon market is $130 billion for Papua Province and $43 billion for West Papua, with district averages of $4.5 billion and $3.3 billion for Papua and West Papua, respectively.

As discussed in **Section 5.2**, the revenues created from forest carbon stock valuation are split into restricted and unrestricted revenues. This section focuses specifically on the restricted revenues that contribute to The *Tanah Papua* Forest Carbon Fund. The fund will be managed to create earnings. The total net earnings will subsequently be placed into Forest Carbon Dividend, inflation offsetting, and earning reserve accounts. In this study, we estimate that the total dividend obtained for Papua Province is approximately $4.5 billion, and for West Papua, it is $1.5 billion. These values, which consist of a real return that is separate from the principal, will be further distributed to citizens residing in Papua and West Papua.

Per Capita Carbon Dividend

Using population size information, we find that in Papua Province, the carbon dividend per capita ranges between $18 and $22,800, with an average of $2,400 and a relatively high standard deviation. See **Table 5.2**. The findings for the average per capita dividend in West Papua Province are quite similar. It amounts to $2,190, with $7,780 being the highest value and $6.7 the lowest. Mamberamo Raya has the highest per capita carbon dividend in the province of Papua, while Tambrauw has the highest per capita dividend in West Papua Province. In contrast, Jayapura municipality and Sorong municipality have the lowest per capita dividends in Papua and West Papua, respectively.

Arguably, the most striking findings are those for Mamberamo Raya. This district has the highest per capita dividends and is responsible for the high standard deviation in the data. The district has a large forest but a small population compared to all other jurisdictions. A contrasting picture emerges for the municipalities with the smallest per capita dividends as their forests are small and their populations are relatively large.

Distributing the Dividend as a Basic Income

We turn to the distribution of the dividend as a basic income that is universally available to all residents in *Tanah Papua* with no conditions whatsoever attached. In doing so, we consider two factors: Age structure and the affirmative identity of Papuan people. The first aspect encompasses the question of how much of the dividend an age group may receive, and the second aspect aims to ensure that the funds are fairly distributed.

To distribute the Forest Carbon Dividend, we use "per capita dividend" as the baseline (**Table 5.2**). We assume varying allocation arrangements: Children (aged between 0 and 4 years) receive 50% of the baseline; young adults (5-19 years) receive 75%; and adults (older than 20 years) receive the full baseline amount (100%). The results are presented in **Figures 5.4** and **Figure 5.5**.

These box plots are very useful for interpreting and comparing the distribution of the data. They show the dividends for each person based on the three age categories (**Figure 5.4.a**) and the total dividends – based on population size – in each of the age categories (**Figure 5.4.b**). These figures reveal that on average, the people of Papua and West Papua Provinces receive different per capita dividend amounts; the average per capita dividends in Papua and West Papua combined are $1,170, $1,750, and $2,330 for children, young adults, and adults, respectively. For Papua alone, the average per capita dividends for children, young adults, and adults are $1,200, $1,800, and $2,400 per year or approximately Rp1,700,000, Rp2,100,000, and Rp2,800,000 per month, respectively; for West Papua, the amounts are $1,100, $1,600, and $2,200 annually or Rp1,300,000, Rp1,900,000, and Rp2,300,000 monthly, respectively. In comparison, Papua's provincial minimum wage for 2021 according to the Indonesian Ministry of Manpower decree is Rp3,500,000, and West Papua's is Rp3,100,000. Under the scheme proposed here, the dividend obtained from the forests is still lower than the minimum wage in these provinces.

The figures also allow us to conclude that the region varies widely in the per capita dividend, given the much longer whiskers in the box plots for districts in Papua Province, although the data for West Papua is less dispersed. Further, the positive skewness of the data indicates a high frequency of high values. Among the local jurisdictions, Mamberamo Raya is an outlier, accounting for the highest per capita dividend in both provinces.

In terms of age category, the largest portion of the fund is distributed to adults due to the combination of their categorical share and their high numbers in the population; young adults and children receive the second and third largest portions of the funds. Regarding age group, the population between 20 and 34 years of age receives the highest per capita dividends (**Figure 5.5**).

Figure 5.3

Papua and West Papua's forest carbon stock at the district and municipality levels

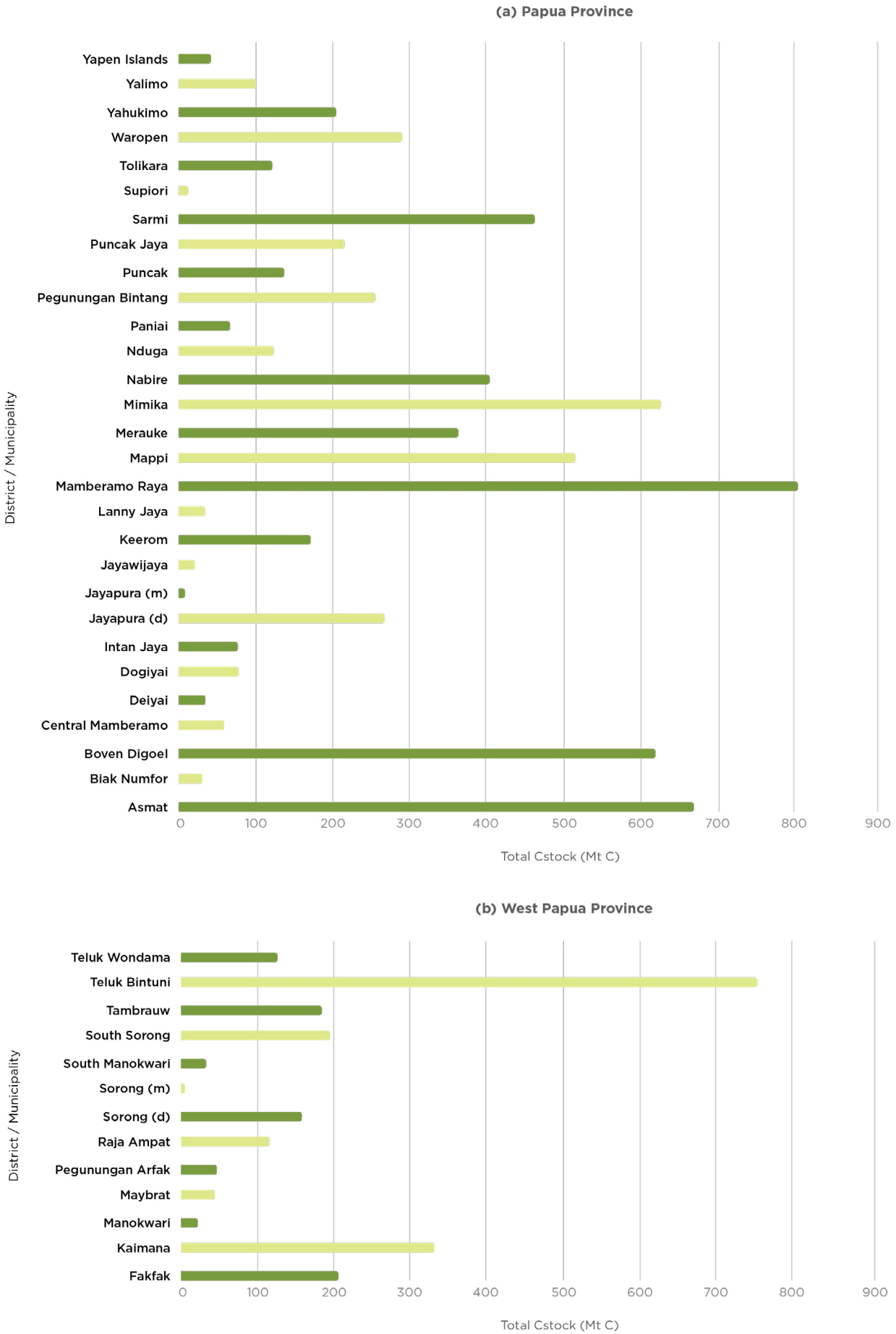


Table 5.2

Projected population and per capita dividend of Papua and West Papua Provinces

Papua Province		
District/Municipality	**Population Size**	**Per capita dividend (in US$) (baseline)**
Asmat	99,167	4,294
Biak Numfor	147,664	130
Boven Digoel	68,865	5,737
Central Mamberamo	52,495	706
Deiyai	75,135	292
Dogiyai	97,776	511
Intan Jaya	50,470	963
Jayapura (d)	127,470	1,332
Jayapura (m)	302,770	18
Jayawijaya	210,614	64
Keerom	57,566	1,901
Lanny Jaya	194,680	111
Mamberamo Raya	24,026	22,852
Mappi	100,015	5,108
Merauke	232,311	994
Mimika	216,428	1,843
Nabire	146,498	1,754
Nduga	108,393	724
Paniai	170,396	254
Pegunungan Bintang	76,173	2,112
Puncak	111,367	784
Puncak Jaya	127, 069	1,080
Sarmi	39,742	7,439
Supiori	20,340	408
Tolikara	145,509	534
Waropen	31,930	5,788
Yahukimo	193,874	673
Yalimo	66,004	953
Yapen Islands	97,552	276
TOTAL	**3,392,300**	**69,637**

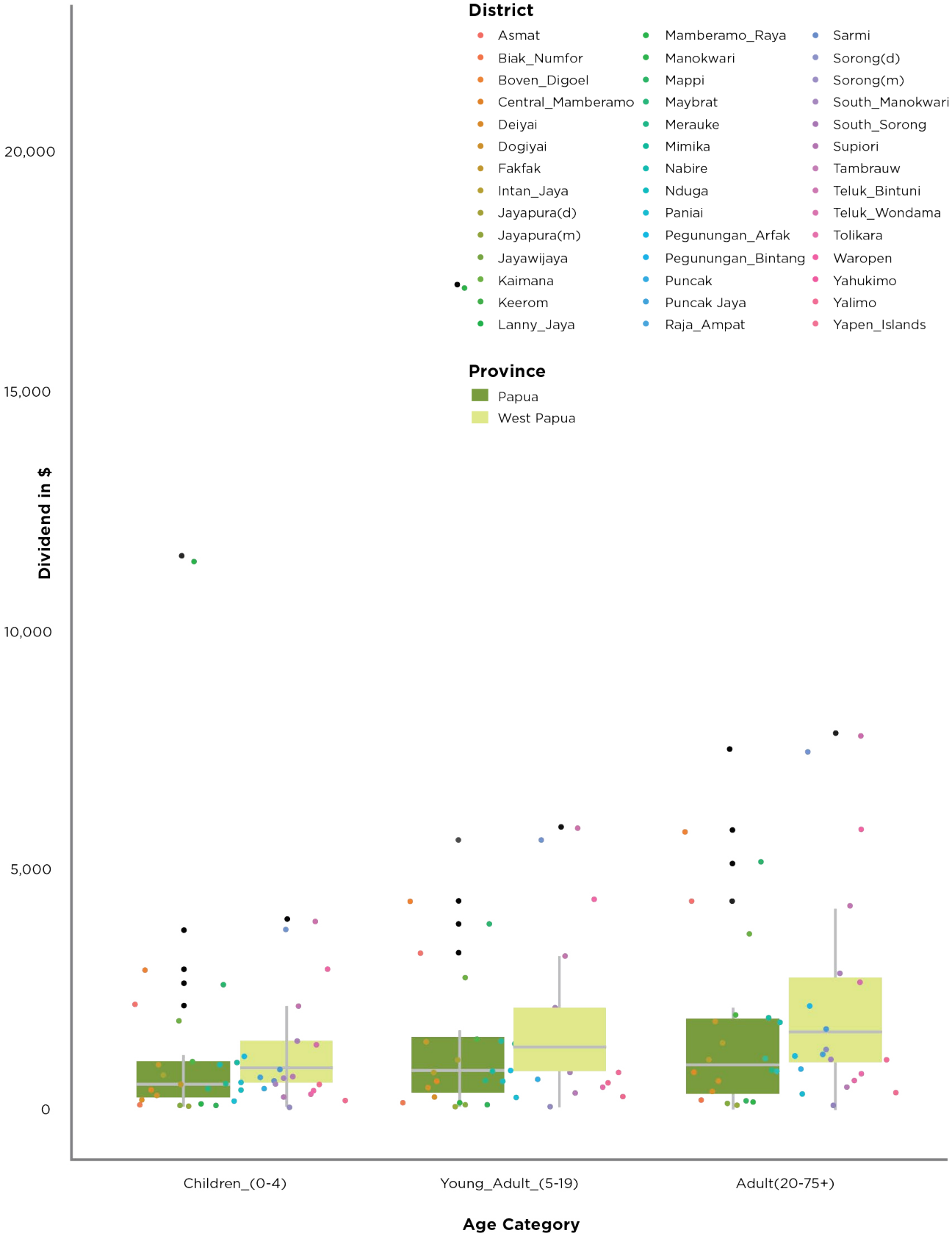
West Papua Province		
District/Municipality	**Population Size**	**Per capita dividend (in US$) (baseline)**
Fakfak	78,929	1,777
Kaimana	62,008	3,608
Manokwari	172,575	87
Maybrat	41,637	755
Pegunungan Arfak	30,723	1,039
Raja Ampat	48,511	1,616
Sorong (d)	90,357	1,188
Sorong (m)	261,776	7
South Manokwari	23,568	980
South Sorong	47,886	2,774
Tambrauw	29,952	4,206
Teluk Bintuni	65,385	7,784
Teluk Wondama	32,974	2,604
TOTAL	**986,280**	**28,425**

Source: Own table. Notes: (1) Population size applies a population analysis conducted by LIPI for this study and reflects the 5-year average projected population (2018-2022), as detailed in Section 3.2; (2) *d* denotes district, *m* denotes municipality.

Figure 5.4

The distribution of the Forest Carbon Dividend by age category in Papua and West Papua districts/ municipalities, with (a) dividend per capita and (b) total dividends

(a) Dividend per Capita by Age Category



(b) Total Dividend by Age Category

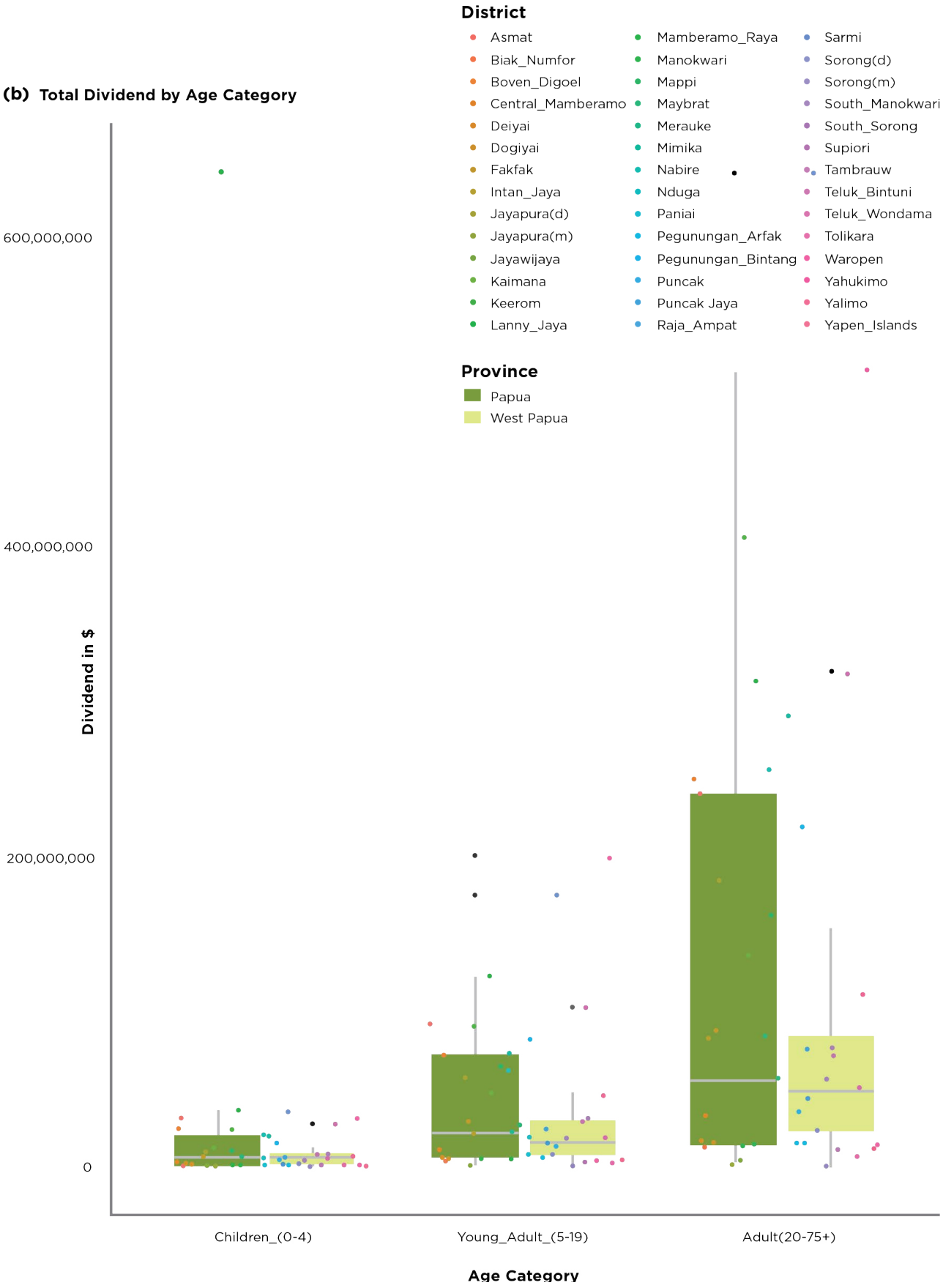
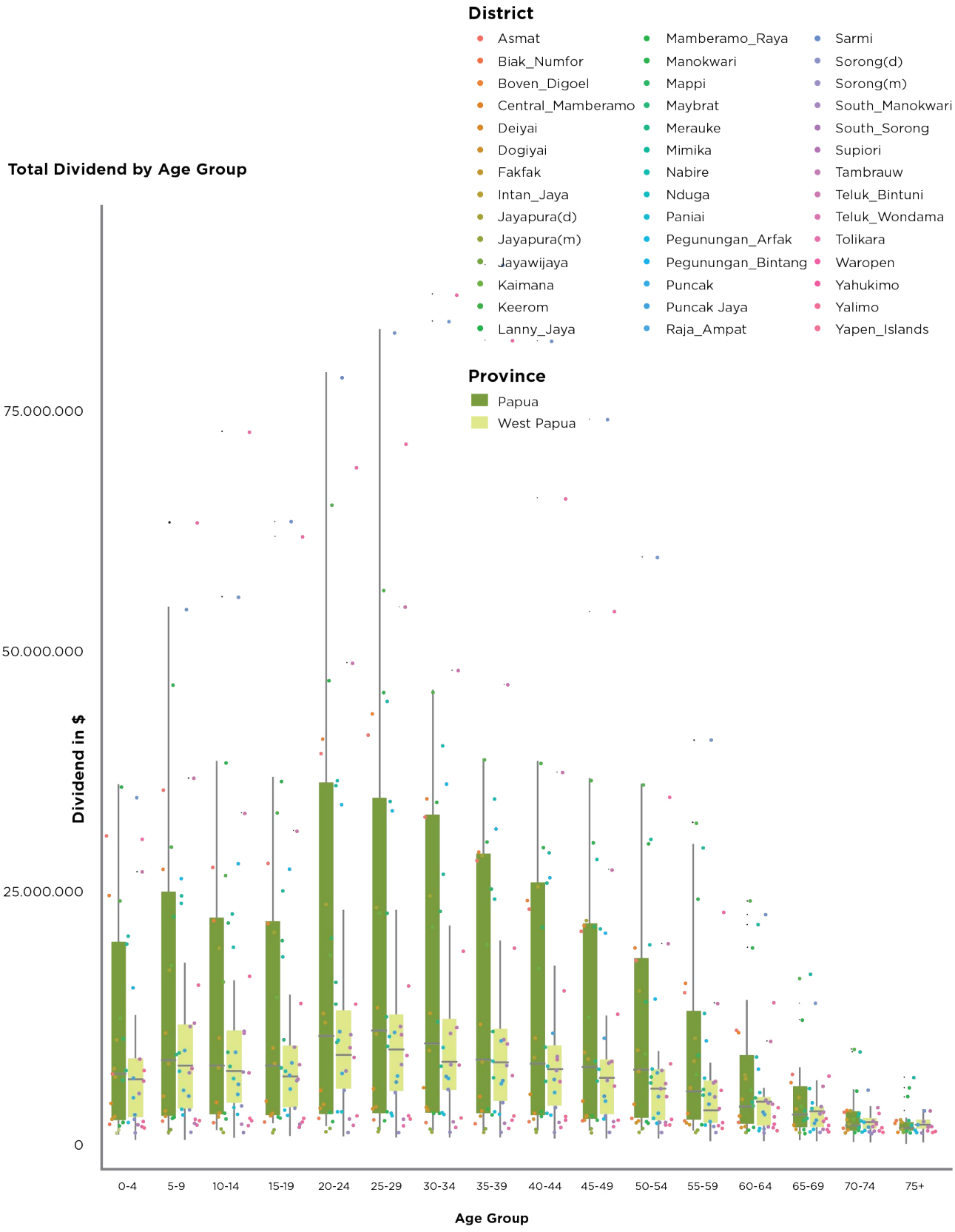


Figure 5.5

The distribution of the Forest Carbon Dividend by age group in districts and municipalities in *Tanah Papua*



Section 6

CONCLUSION

A basic income is defined as a periodic cash payment unconditionally delivered to all. Unconditionality is therefore a key defining criterion by which a beneficiary is eligible to receive a basic income with no conditionalities attached. In the discussion of nature and climate change, unconditionality is a delicate matter – both as a concept and in practice – as it involves a drive to condition a basic income scheme on the achievement of nature- and climate-related objectives. In this report, we look at the (un)conditionality of existing basic income and proximate schemes throughout the world and in the literature, respectively, that have some relevance to nature and climate. We reveal that important conceptual and practical challenges exist in terms of maintaining the unconditionality of a basic income intended for nature and climate. While no basic income schemes are found that have what we identify as *explicit, ex post* conditioning (that is, in the form of behavioral constraints), we find that *implicit* conditioning is present in some of the basic income proximate schemes. This is especially true in the case of nature conservation-oriented basic income schemes. As a result, the existence of implicit conditioning creates contradictions between the importance of *unconditionality* (that is, as a defining criterion that determines whether a scheme is a basic income or something else) and the *conditionality* that is implicit in the existing basic income proposals for nature and climate.

In this report, we look to Indonesian New Guinea, known as *Tanah Papua* (Land of Papua), to explore the possibility of a basic income for nature and climate. The case of *Tanah Papua* is unsettled for two relevant yet opposing reasons: (1) it has forests so rich that even a small change can drastically affect global climate and biodiversity, and (2) it is the location of the two poorest provinces in Indonesia. A reduction in the forest cover in *Tanah Papua* to 70% from its current level of 87% (40 million Ha) of the total area would release more CO2 than the country's projected CO2 emissions for 2030. To put this into perspective, it would equal more than three times the intended emission reduction from all sectors that Indonesia submitted to the United Nations Framework Climate Change Convention. In addition to belonging to the world's largest tropical island, *Tanah Papua* is home to the greatest biological diversity of flora and fauna on earth, according to recent scientific findings. Unfortunately, in contrast to these climate-changing capacities and a biological richness that is of planetary significance, every 1 out of 4 people in *Tanah Papua* is poor.

At present, programs have been implemented and piloted to address social protection concerns in *Tanah Papua.* In this report, we look at two programs whose purposes are relevant to our understanding of basic income. These are the Family Hope Program or PKH (*Program Keluarga Harapan*), which is a conditional and targeted program, and the Universal Child Benefit (UCB, *Program Bangga Papua*), which is an unconditional and universal program. We found that the payment methods used for these two schemes are costly for the programs

and their beneficiaries alike, and explorations of new methods are therefore highly advised. In terms of the PKH, its mentoring and companion-based program implementation, which is inherent to the design of the program, is increasingly challenging in the unique situation of *Tanah Papua*. The UCB, which has been piloted in a few districts in the province of Papua, currently covers nearly 75% of the targeted children in these districts. Furthermore, although the UCB is almost universal in the pilot districts significant numbers of children who are not indigenous (non-OAPs) would not receive benefits if the program were to expand to cover the entire province. The targeting of OAPs is legitimate but likely ineffective. In terms of financial sustainability, the special autonomy fund (*Dana Otonomi khusus*), which is currently the sole source of financing for the UCB trial, is increasingly less likely to provide sustained funding in the future as it is often hampered by sudden changes in budget allocation. Additional sources for sustainable funding are desirable.

We developed an idea about a basic income for nature and climate called the Forest Carbon Dividend, which is the first of its kind. We conceive this as an integral part of a larger concept that comprises linked elements related to mobilizing, managing, and distributing financial resources. In this concept, basic income is a form of dividend to be shared with the residing population in *Tanah Papua*. The financial resources for the basic income stem from the valuation of the forest carbon stock and are managed through a Forest Carbon Fund, a portion of which becomes the Forest Carbon Dividend. A permanent fund, the Forest Carbon Dividend, is distributed as a basic income to all eligible populations. In addition, in accordance with the affirmation principle, indigenous Papuans (OAPs) would receive additional income from the dividend. The provision of a basic income as such is expected to benefit the local population and indigenous people and, given *Tanah Papua*'s global significance to nature and climate, to contribute to maintaining safe conditions for humanity.

We estimated the basic income for nature and climate for all people in *Tanah Papua*. For this purpose, we calculated the Forest Carbon Dividend from both above- and below-ground carbon stocks in *Tanah Papua*, valued them at a sensible carbon market price and shared them with all residing individuals there. Concerning the forest carbon stock, we found that the districts of Mamberamo Raya and Teluk Bintuni contribute the largest stock in the provinces of Papua and West Papua, respectively, due to their comparably large forest areas and high soil carbon storage in peatland forests. We also showed that the *total revenues* obtained from the carbon market are $130 billion for Papua Province and $43 billion for West Papua. We calculated the dividend for every person in different age groups by pricing carbon at $5 per ton CO2. At this price, Papuans and West Papuans would receive different per capita dividend amounts. For those in Papua, children, young adults, and adults would receive an average per capita dividend

every month of Rp1.7 million, Rp2.1 million, and Rp2.8 million, respectively; for those in West Papua, the amounts for every person in each of these age groups would be Rp1.3 million, Rp1.9 million, and Rp2.3 million monthly. For perspective, the average monthly dividend obtained from the forests and shared with the adult population, as presented here, is approximately 80% and 75% of the provincial minimum wages in Papua (Rp3.5 million/month) and West Papua (Rp3.1 million/month) at the time of writing (2021). The varying dividend amounts for the different age groups are due to the combined effects of designated shares and the number of people in each age group, with the age group between 20 and 34 years receiving the highest per capita dividend.

ENDNOTES

Basic income and its features

[1] The analysis presented here is part of a larger study by Ni Made Rahayu Maitri and Sonny Mumbunan that reviews basic income for nature and climate. In addition to the conditionality matter shared here, the analysis also covers two other issues of interest: the role of a basic income in decoupling economic growth from biodiversity loss/GHG emissions and the source of funding for a basic income for nature and climate.

[2] We select the basic income and proximate schemes discussed here based on three factors: (1) their main goal, i.e., schemes that focus on environmental conservation and protection (Fletcher and Büscher, 2020; Kaufman et al., 2019); (2) their sources of funding, i.e., schemes that are funded by natural resource revenues are chosen; and (3) their targeted population, i.e., the schemes that target native tribes due to their tendencies to preserve their surrounding ecology (Crevello, 2004; Jianchu, 2003; Schwartzman et al., 2000). It is important to note that the relevance of each scheme to nature and climate may vary to some degrees. As an example, take oil- or mining-funded schemes, namely, the Compensatory Cash Transfer in Iran, the Human Development Fund in Mongolia, or the Renda Basica de Cidadania in Brazil. These schemes are relevant because revenues from natural resources (i.e., oil and mining rents) are used as the source of funding, even though the extraction of these resources may negatively affect the environment for the benefit of human development. In contrast, although the Alaska Permanent Fund Dividend (PFD) is also an oil-funded scheme, its relevance to nature and climate lies in the fact that it transfers payment to American Indian and Alaskan Native people (Berman, 2018). Therefore, it targets native tribes and has an environmental dimension as native tribes tend to interact closely with the environment.

The context: *Tanah Papua,* Indonesian New Guinea

[3] Further information and notes on the poverty data that we use in this figure: (1) **For 1990**. The poverty line is determined using the head count index; the percentage of the population below the poverty line is based on per capita expenditure for food and nonfood items. Data: SUSENAS (national social-economic survey), complemented by the Studi Konsumsi Bahan Makanan Pokok/Makanan Jadi (SKM) and population census (SP, 1990) to interpolate the population living in poverty. Source: *Kemiskinan dan Pemerataan Pendapatan di Indonesia 1976-1990* (BPS, 1992). (2) For **1993, 1996**. The approach was similar to that used for 1990. Changes were made to the determination of the poverty line: calorie consumption was expanded to include the population within a margin above the poverty line, which was considered a reference population. Source: *Laporan Sosial Indonesia 1998: Kemiskinan, Pengangguran dan Setengah Pengangguran* (BPS, 1999). (3) For **2000-2006**. Similar to the approach used for the previous years. Notes: For provinces without an SUSENAS survey, such as Papua, poverty is estimated by assuming that the percentage of poor

people is the same as in the last year for which such data were available. Source: *Data dan Informasi Kemiskinan Provinsi*, various years (BPS, 2003; 2004; 2005; 2006; 2007). (4) For **2007**. Similar to the approach used for previous years. Notes: The reference population is now defined as 20% of the population above the temporary poverty line (GKS), which is calculated using the previous annual poverty line and inflated according to the inflation index (IHK). Based on this, poverty lines for food and nonfood expenditures are introduced. Data: *SUSENAS, additional information from the Basic Needs Commodity Package Survey (SPKKD) for nonfood expenditures estimation. Source: Data dan Informasi Kemiskinan Provinsi 2007* (BPS, 2008). (5) For **2008-2010**. Generally similar to the approach described in the previous note. Source: *Data dan Informasi Kemiskinan Provinsi 2008* (BPS, 2009), *Data dan Informasi Kemiskinan Kabupaten Kota,* various years (BPS, 2010; 2011). (6) For **2011-2020**. From 2011 onwards, SUSENAS' Consumption Modules were applied to estimate poverty at the district and municipality levels. The standard stages used for estimation are calculations of (a) monthly per capita average expenditures based on household consumption baskets; (b) average expenditures; and (c) correction factors for inflation and inflation/deflation for consumption expenditures, all of which are presented by quarter, province, urban-rural category, commodity group, and time period of interest. Source: *Data dan Informasi Kemiskinan Kabupaten/Kota* (BPS publications from 2011-2020). (7) **From 2013 until 2020**, poverty calculation applies weightings derived from the 2010 Population Census (SP 2010). The poverty rates for 2012 and subsequent years are weighted backcastings from this projection. Source: *Data dan Informasi Kemiskinan Kabupaten/Kota* 2013 (BPS, 2014). For the moving average in the figure, a simple moving average with a period of 5 years is used; this time frame is chosen to represent the average policy time of an administration.

[4] To project the future populations of districts/municipalities in *Tanah Papua*, we use several data sources, namely, the 2010 population census (SP), published 2010-2020 district/municipality population projections, the intercensus survey (SUPAS) conducted in 2015, and the Indonesian population projection for 2015-2045 using SUPAS 2015 as a baseline. Data from SP 2010 and SUPAS 2015 are used to calculate population growth average and the estimated future population for each district/municipality. The population projection at the provincial level is used to control for the population projection at the district/municipality level.

[5] To tackle such data constraints, we use an alternative method that applies geometric extrapolation. This method assumes that the population growth rate after the census, which refers to both the census and the intercensus survey, is constant over time (George, Smith, Swanson, and Tayman, 2004). Furthermore, we use a single factor, which is the ratio of the total projection at the provincial level to the total population resulting from geometric extrapolation for all districts/municipalities, to correct the geometric extrapolation results. With these geometric projections, we are able to produce population projections by district and municipality and by age and sex until 2025. However, there are some limitations to the geometric extrapolation method: (1) it does not differentiate population changes by birth, death and migration; (2) it is highly dependent on the latest data used for calculations and

assumptions of growth rates or trends that may differ depending on future conditions, and (3) the assumption of a constant growth rate only applies to short-term projections; hence its recommended use for population projections.

Social protection in *Tanah Papua:* a tale of two cases

[6] We apply a descriptive research method with a qualitative approach. Our sources of information were interviews and discussions with policy makers from both provinces in *Tanah Papua*, (Provincial Social Service Agencies) and PKH implementers. The latter consists of the PKH Papua Regional Coordinator, the West Papua PKH Regional Coordinator, the Papua-Maluku PKH Regional Coordinator, and PKH Facilitators. We obtain additional information from scientific publications and reports. In addition, we derive some observations for relevant aspects of this study from other research that was part of a larger basic income for nature and climate project.

[7] For this part, we use a qualitative approach to analyze the implementation of The Programme. We deem this method the most appropriate for addressing our topics of interest. We review the literature to understand and discuss the UCB concept and reflect on the implementation of The Programme and its financial scheme in light of relevant theories and practices. Data used in the analysis, such as the data for poverty, child wellbeing, and demographic characteristics, are obtained through various secondary sources and from other works dedicated to the basic income for nature and climate project. Data and information related to the implementation of The Programme, i.e the number of beneficiaries, budgeting, distribution of benefits, achievements, and issues, were extracted from interviews and focus group discussions with relevant stakeholders, such as representatives from the provincial government and institutions working on child issues (e.g., UNICEF and Save the Children).

Basic income for nature and climate

[8] All carbon prices in the range of $5-10 per ton CO2 refer to carbon pricing under results-based payment schemes for comparisons to other carbon price schemes. For example, in Papua New Guinea the carbon price is set at $11 for every ton of reduction in emissions, according to the REDD.plus project of the Coalition for Rainforest Nations. Source: https://www.redd.plus/, accessed on April 14, 2021.

[9] Here, the term "forest" is based on the Ministry of Environment and Forestry's definition, that is, the integrated ecosystem of an area of land containing biological natural resources, dominated by trees, that are sustainable within their natural environment and cannot be separated from it. Primary forest is defined as natural forest that has not experienced human disturbance, whereas secondary forest refers to forest that has grown through natural secondary succession.

[10] We explore the questions we pose through an array of qualitative and qualitative approaches. The quantitative approaches include carbon stock valuation, population dynamic projection,

fund management, and statistical analysis, while we use a qualitative approach to make sense of the discussion of fund distribution. To determine how much revenue the forests in *Tanah Papua* could provide, we estimate the value of six forest cover classes (primary dry land forest, primary mangrove forest, primary swamp forest, secondary dry land forest, secondary mangrove forest, and secondary swamp forest) using a standardized allometric model following Chave et al. (2005). We then extrapolate it to the landscape level through satellite imaging. This allometric model should provide the highest degree of confidence as it has been promoted by both national (Krisnawati et al., 2015) and international organizations (UNFCCC, 2015). We derive land cover images from the Land Cover Map of the Indonesian Ministry of Environment and Forestry (MoEF), while carbon stock data is sourced from the Indonesia Carbon Accounting System (INCAS). In the next step, we valuate the carbon stock by assuming that the carbon value is set for forest carbon stock based on a real, existing reference, for instance, that established in Gabon under the Norway-Gabon Partnership. Regarding financial resource management, as we obtain the total revenues, we arrange them into two pools: restricted and unrestricted. The restricted pool is allocated to the *Tanah Papua* Forest Carbon Fund to be managed by a trust fund or similar approach. The unrestricted fund goes to local and national government budgets. Here we focus our analysis on the restricted fund: we use a fraction of the Forest Carbon Fund there and manage it as earnings to fund the Forest Carbon Dividend. To run simulations, we apply the census and intercensus data from Indonesia Statistics (BPS) and analyses from the Indonesian Institute of Science (LIPI). We utilize RStudio for statistical analysis.

[11] The price paths are developed in conjunction with the reference carbon price for results-based payments for reduced emissions in Indonesia ($5/ton CO2), as presented in Table 5.1. Note that under a results-based payment for carbon capture, such as the case in Gabon, the price is likely higher ($10/ton CO2).

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