

Assessing Poverty Interventions: Conceptual, Methodological and Empirical Perspectives Relating to Property Rights Formalization in Rural Tanzania

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How to cite this paper: Stein, H., Askew, K., Nagaraj, S., Odgaard, R., & Maganga, F. (2025). Assessing Poverty Interventions: Conceptual, Methodological and Empirical Perspectives Relating to Property Rights Formalization in Rural Tanzania. *Modern Economy*, 16, 251-270.

<https://doi.org/10.4236/me.2025.162011>

Received: October 13, 2024

Accepted: February 15, 2025

Published: February 18, 2025

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Abstract

This paper reports on our approach to the assessment of poverty interventions, specifically that of property rights formalization in rural Tanzania. Property rights formalization, or land titling, has been heavily funded premised in part on its purported ability to reduce poverty. In the view of its proponents, it has the potential to increase income through a rural household's productive activities. Yet, independent evaluations of this poverty intervention are lacking. We contend that assessment of a poverty intervention should effectively encompass the intervention's pathways that are expected to lead to poverty reduction. Our approach surveys households by village, the level at which land titling is implemented. We use a household income measure that we call imputed income, which conceptually and empirically captures a rural household's productive activities. This is a simple and reliable metric that supports independent assessment of poverty reduction interventions, such as titling, by classifying the poor based on productive activities. It thereby lessens the need to use publicly available household income data generated for a different purpose or by agencies that might have a vested interest in demonstrating policy success or failure. To gauge the merit of our household income measure, we compare it to three other commonly used measures: reported income, consumption expenditure and household assets. The value of our approach is then demonstrated by relating change in poverty to change in title-deed ownership using ten years of data from ~2000 households in 40 villages in rural Tanzania. Our approach is a contribution to methodologies that evaluate poverty

interventions and not to poverty measurement.

Keywords

Assessing Poverty Interventions, Property Rights Formalization, Imputed Income, Tanzania

1. Introduction

The formalization of customary land rights (Odgaard, 2002) in the United Republic of Tanzania (URT)¹ has seen substantial effort, time and funding (Maganga et al., 2016). Peruvian economist Hernando de Soto (2000) argued that poor people have assets, including land, that they cannot tap because they are not legally recognized. Land that is “dead capital” (de Soto’s term for untapped assets) can be turned into “live capital” through formalization and collateralization. His argument rests on the orthodox economics claim that Western economic development has been successful because of secure property rights (Demsetz, 1967; Everest-Phillips, 2008; North, 1981; North & Weingast, 1989; De Long & Shleifer, 1993). According to de Soto and like-minded economists, property rights formalization, that is titling of land owned, accords formal recognition to the wealth of the poor, thus they are no longer technically “poor”. Assets can then be liquidated for cash or used as collateral for credit, enabling the poor to pull themselves out of poverty by improving their land or participating in markets or business. Security from titling motivates increased work effort and investment in the land. By contrast, lack of property rights recognition impedes the ability to rent out or sell land and raises the cost of defending ownership of the land thereby constraining income. Titling, then, is key to improving the incomes of the poor.

De Soto’s clearly articulated narrative resonated well among development policy makers and their institutions. The governments of Norway, Denmark, Sweden, the United Kingdom, USA, and European Union, alongside non-governmental organizations (NGOs) like Concern Worldwide Tanzania (CWT), CARE International, and Oxfam International, all have funded titling efforts in Tanzania. In 2004, former President Benjamin Mkapa initiated a “Programme to Formalise the Assets of the Poor in Tanzania and Strengthen the Rule of Law” (MKURABITA in Swahili), receiving funding of seven million USD from Norway². MKURABITA is based in the President’s Office and has been involved with titling in hundreds of villages. CWT, an Irish NGO that has been active in Tanzania since 1979,

¹The URT comprises two formerly independent sovereign nations—Tanganyika (Tanzania Mainland) and Zanzibar. Tanganyika achieved independence from Great Britain in 1961, Zanzibar in 1963. A revolution in Zanzibar in January 1964 was soon followed by the formation of the URT that April. Here, we follow common usage that uses “Tanzania” to refer to Tanzania Mainland, and URT to reference both Tanzania Mainland and Zanzibar. Our data do not include households in urban Tanzania or in Zanzibar. The URT is among the poorest countries in the world, ranking 167 out of 193 countries in the 2023/2024 Human Development Index (UNDP, 2024: p. 281).

²Interview with Seraphia Mgembe, Director of Finance and Administration for MKURABITA, 7 June 2010, Dar es Salaam.

initiated a program in 2005 costing 1.8 million euros that was extended through December 2009 (CWT, 2005).

Other NGOs have also been involved with sponsoring titling along with large scale donor initiatives such as the World Bank (WB) (Private Sector Competitiveness Project in Babati and Bariadi districts, 2005-17), United States Agency for International Development (USAID) (Land Tenure Assistance (LTA) program in Iringa, Mbeya and Songwe regions, 2014-19), and United Kingdom's Department for International Development (UK DFID) (Land Tenure Support Program (LTSP) in Morogoro co-financed by Danish International Development Assistance (DANIDA) and Swedish International Development Assistance (SIDA), 2016-19). USAID launched the \$1.5 million LTA program in December 2015 to issue 50,000 new rural title deeds (Certificates of Customary Rights of Occupancy or CCROs)³ and in December 2021, the World Bank approved a \$150 million Land Tenure Improvement Project (LTIP) aimed at issuing 500,000 CCROs⁴. The Tanzanian government continues to be involved in issuing CCROs. In a recent budget speech to Parliament in May 2023, then Tanzanian Minister of Lands, Housing and Housing Development Angeline Mabula set a goal of generating 520,000 CCROs in the 2023/24 year alone, the third year in a row that the government would set this same target. However, they were only able to issue 42,684 in 2021/22 (8% of the target), 51,762 in 2022/23 (10% of the target) and 21,952 in 2023/24 (4.2% of the target), due in part to declining support from the donor community⁵. Evaluations of the usefulness of titling have largely focused on specific outcomes like investment, credit and security, and these show mixed results (Sjaastad & Cousins, 2008; Stein et al., 2016; Msangi et al., 2022).

Despite the extensive and continued titling effort, there is an absence of independent evaluations of property rights formalization as a poverty reduction strategy. This paper reports on our approach to the assessment of poverty interventions, specifically that of property rights formalization in rural Tanzania. Pu et al. (2024) argue that the measure used to identify the poor should match the objective since classification varies by how poverty is measured. We contend that, beyond classification, the assessment of a poverty intervention should effectively encompass the intervention's pathways that are expected to lead to poverty reduction. Our approach recognizes that property rights formalization is implemented at the village level and impacts a rural household through its productive activities rather than the prices it faces. We use an effective measure of rural household income that we refer to as imputed income. It is based on the rural household's productive activities and includes own-consumption. Imputed income is obtained for

³https://2017-2020.usaid.gov/sites/default/files/documents/1860/Land_Tenure_Assistance_Fact_Sheet_March_2019.pdf.

⁴<https://www.worldbank.org/en/news/press-release/2021/12/21/tanzania-new-world-bank-financing-to-secure-land-rights-for-up-to-two-million-citizens>.

⁵URT (2021), URT (2022), p. 13; URT (2023), p. 12; URT (2024), p. 9. See also

<https://dailynews.co.tz/massive-land-survey-in-offing> and

<https://www.thecitizen.co.tz/tanzania/news/national/land-digitalisation-a-priority-as-government-eyes-sh8-trillion-investment--4247608>.

households selected from villages, the level at which the intervention is implemented, and furthermore are visited twice to support dynamic analyses, the preferred form of evaluations for property rights formalization (Conning & Partha, 2007: p. 4). The approach is a contribution to the methodologies that evaluate poverty interventions and not to poverty measurement.

The rest of the paper is organized as follows. In the next section, we gauge the comparative merit of imputed income by comparing it to three other measures of household income used in Tanzania to assess poverty, reported income, consumption, and household assets, noting their limitations for our purpose. We then describe our approach, highlighting the imputed income measure, and demonstrate its effectiveness empirically by relating change in poverty to change in titled ownership. The data are from nearly 2000 rural households in 40 villages in Dodoma, Kigoma, Manyara, Mbeya and Songwe regions collected between 2009 and 2019⁶. The paper closes with a comparative review of our approach, highlighting its value over other approaches.

2. Perspectives on Assessing Poverty in Rural Tanzania

At its beginning in 1961, the government of Tanzania (later the URT) was interested in moving the country out of poverty and helping a mostly poor population cope through food subsidies and other forms of assistance. Over time, the WB funded these projects through the International Development Association, addressing its purpose to, among others, raise standards of living (Beckman, 1986). The growing evidence of the detrimental impact of structural adjustment on the poor and the development of social programs aimed at ameliorating this effect (Beckman, 1986; Stewart & van der Geest, 1995) increased the need to both adequately identify the population to be supported by these programs and evaluate the impact of these programs on the poor.

To identify the poor, data on income are typically collected at the level of a household and adjusted, often by the number of household members, to arrive at per capita income. This is then compared to a minimum amount necessary for an individual's sustenance (the poverty line). For example, the poverty headcount ratio tells us about the percentage of households with incomes per capita below the poverty line. Information on household incomes per capita can also be used to show how incomes vary across different communities (relative poverty) or across time (dynamics of poverty).

As a concept, household income can be measured in different ways. Reported income is the measure used in some countries (Meyer & Sullivan, 2003). The WB has since 1990 typically used consumption expenditures (World Bank, 1990). In contrast to the "flow" of income and consumption expenditure over time, a less commonly used measure of the household income is the "stock" of household assets at a given point in time (see, for example, Brockington et al., 2018, 2021).

⁶We have used the data elsewhere to study access to energy, provision of credit and women's rights (see, for example, Askew & Odgaard, 2019; Askew et al., 2023).

Here, we review in turn these three measures which have been used to assess rural poverty in Tanzania, noting their limitations for our purpose.

2.1. Reported Income

Early household surveys in Tanzania measured poverty using reported income. The income concept changed from cash income during the previous month, requiring estimation from other sources of non-cash and seasonal income (van Ginneken & Park, 1984: pp. 147-148), to one including consumption of own food with a one-year recall (Bevan et al., 1989: p. 1). Response rates were not high (van Ginneken & Park, 1984) as is common with income surveys (Yan et al., 2010). Differences across surveys (including adjustments for non-monetary income and definition of a household) resulted in differing conclusions about changes in income and poverty. For example, Bevan et al. (1989) concluded that real incomes declined between 1976/77 and 1982/83, while Sarris and van den Brink (1993: pp. 147-154) found no decline over the same period, arguing that the earlier results were in part due to the choice of deflator. Additionally, Sarris and Tinios (1995) found that the level of poverty had declined between 1976/77 and 1991. It is also worth noting that Tanzania was in deep economic crisis during this time and the collection of reliable data was problematic (Svendsen, 1986; Maliyamkono & Bagachwa, 1990).

2.2. Consumption Expenditures

Since 1991, household budget surveys in Tanzania have used consumption expenditures to measure household income. This approach is theoretically supported by the neoclassical framework of individual utility maximizing behavior⁷. Consumption expenditure measures “money metric utility” by valuing utility in dollars, so that given prices, if a person wants more utility, they will spend more (Deaton, 2003). While surveys have obtained data on both reported income and consumption expenditures, the National Bureau of Statistics, Tanzania (NBS) notes the value of the latter for poverty analyses (NBS, 2002: p. 101, 105):

“The main focus of the analysis presented in this report has been on income and non-income poverty indicators. Consumption expenditure information is a more reliable basis for this analysis. Reported income is frequently an unreliable measure of welfare. It was shown to correlate reasonably well with the expenditure data, however.”

The application of the consumption expenditures approach in practice requires deciding between salient but very different trade-offs, for example, the choice whether to capture all expenditures, and include poorly measured components like irregular items, or exclude these “and sacrifice accuracy” (Deaton, 2003: p. 150). In terms of fieldwork, expenditures across households, collected using daily diaries for a specific period in different regions, are made comparable by deflating

⁷The neoclassical approach dominates World Bank household surveys (Stein, 2008).

them, making the selection of price deflators important in poverty measurement (Deaton, 2003: p. 139).

Not surprisingly then, differences across surveys have resulted in differing conclusions about changes in income and rural poverty. The Household Budget Surveys (HBS) of 2007, 2011/12 and 2017/18, and the National Panel Surveys (NPS) conducted every two years since 2008/09 are the most referenced data sources for understanding poverty and inequality in Tanzania and correspond with the timeframe of our study (2009-2019). The NPS are based on a smaller sample than the HBS but capture expenditures of the same households over time. The 2020 HBS report emphasizes the “remarkable economic growth” and “a persistent decline of poverty” seen in the declining extreme poverty headcount ratios and rural inequality between 2007 and 2018, robust to changes in survey design (World Bank, 2020: p. 2-5, 52). In contrast, the NPS data showed that extreme poverty and inequality increased between 2008/09 to 2012/13 (Belghith et al., 2018: p. 2). The reasons for these observed differences included the choice of deflators used to measure real consumption, estimation of own-consumption, recall periods and methods for estimating poverty levels (Belghith et al., 2018). Redoing the analysis using the consumer price index (CPI) as a common deflator did reduce the differences both in levels and trends between the HBS and the NPS.

Consumption expenditures have also been used somewhat problematically to understand the sources of improvement for the poor. Using a regression decomposition technique, the World Bank divides the changes in consumption into two main sources (World Bank, 2015: pp. 49-51). The first is due to improvements in personal characteristics or endowments (such as education, ownership of land or assets, access to employment opportunities, and local infrastructure). The other is due to changes in the returns to these characteristics or endowments. The biggest source of improvement for the poor was endowments, led by a rise in assets and unexpectedly land, with the poor seeing increases in ownership of five acres or more (World Bank, 2015: Figure 1.6), a questionable result given population pressures and the paucity of available land that we observed in the forty villages we visited. Indeed, examining assets and their returns in a consumption expenditures framework is problematic as the methodology omits savings and some large ticket items (like tractors), which can be a significant part of the income and returns generated by assets.

Poverty analyses based on consumption expenditures have other limitations that constrain identification of the poor. The distribution of consumption expenditures tends to understate income inequality because it omits savings held mostly by the rich. Dietary preferences may have an impact on expenditures as do cultural traditions. A pastoralist might seem wealthier because they prefer to eat (more expensive) meat compared to a farmer that prefers (less expensive) sorghum even if both have equal incomes. The use of monthly diaries to record expenditures can be problematic in rural areas as income is seasonal. The sub-sample month in which the household participates may impact the number of transactions recorded, and there may be entry fatigue of respondents, and possibly of

the enumerators, towards the end of the month (Dabalén et al., 2016: pp. 68-71). The pattern of observed expenditures may also be influenced by the Hawthorne effect, where participation in the survey is affected if the respondent is aware of being observed (McCambridge et al., 2014). Even the recall period can affect recorded expenditures. The NPS used a seven-day recall from only the household head who might be unaware of the consumption of other members of the household. In contrast, the HBS gathered diaries from multiple household members, which is better but can lead to over-reporting of shared items (Howe et al., 2012).

2.3. Household Assets

Ponte and Brockington (2020) examine the dynamics of rural transformation and poverty through the lens of changes in household assets. They discuss the results of visits to previously surveyed villages between 2016 and 2018. Between 60 to 80 percent (depending on the village) of the original households were revisited and assets and life histories documented using mixed methods. Households in 18 villages were ranked into categories of wealth based on focus group discussions of villagers and village leaders. The authors do not reveal the nature of the questions or the results for all the villages, instead presenting findings on changes in the distribution of wealth across the villages and from case studies of three villages, all from the largely fertile and rain-rich Morogoro Region. The wealth of eleven villages had moved from a classic pyramid shape with a preponderance of poor, to a pointed egg distribution where “the middle tier of village society is thickening” (Ponte & Brockington, 2020: p. 222). However, the analysis was based largely on home improvements, such as corrugated iron roofs and brick walls. Since these are now more easily available, it is hard to determine if this represents a real rise in wealth or simply indicates greater accessibility due to a comparative decline in prices.

Ponte and Brockington (2020) argue that their analysis leads to three “novel” contributions: that small-scale agriculture is driving rural transformation, that there is a growing middle class in rural areas, and that impediments to productivity growth due to demographic or agroecological conditions have not led to predicted declines in livelihoods. Putting aside the issue of novelty⁸, how well are these arguments buttressed by the evidence? The authors assert that the main source of prosperity in the three villages has been the ability of small-scale farmers to switch into various cash crops with higher returns, allowing them to accumulate more assets. They argue that this undermines claims by some authors that smallholders are stagnantly enmeshed in subsistence agriculture and largely eschew markets. However, this misses the point of subsistence farming. It is not a question of market participation but the way in which poor farmers access the markets. It assumes that people store crops for their own consumption rather than what often occurs: the sale of food crops at harvest due to the need for cash and the purchase of food in other seasons (Carletto et al., 2015). The real focus should

⁸The idea of small-scale agriculture as dynamic is not new (Lipton, 2010).

be on the price of food relative to other crops and the extent to which poor farmers are net food buyers.

2.4. Discussion

The measurement of rural household income is problematic especially because non-monetary income is important (Sarris & Tinios, 1995) and because income “fluctuates frequently over a short term” or is “often reported less accurately” (MoFP-PED, 2020: p. 90). All three approaches used in poverty analyses in rural Tanzania discussed above—reported income analyses from the 1960s to 1990s; consumption expenditure analyses from the 2000s through the present; and asset analyses represented by the work of Brockington and colleagues—attempt to address the issue but have limitations.

Reported income often excludes important components of household income especially of the poor (Meyer & Sullivan, 2003). Consumption expenditure is an improvement but is conceptually removed from the dynamics of income that are central to understanding inequality, class differentiation and the potential sustainability of poverty alleviation. These areas have been understudied in part due to the dominance of neoclassical economics (with its focus on methodological individualism) on the African continent (Stein, 2021). The approach delimits the ability to understand policy interventions like property right formalization that impact a household’s productive activities since the effects are only indirectly and incompletely measured through revealed consumption. For example, consider a subsidy package of inputs allocated to farmers. The impact on poverty might not be measurable if the intervention increases savings but not consumption, though a rise of savings might be an important goal of poverty reduction.

The asset approach deals with some of the difficulties with the reported income and consumption expenditures, which may not capture irregular purchases like land, farm equipment and irrigation systems. The idea of asset accumulation as a priority in the farmer’s own views of prosperity to generate income, facilitate borrowing or liquidate as necessary is valuable in understanding poverty. Types of poverty can be distinguished by asset profiles as assets are easily counted. However, the approach is not particularly useful for evaluating poverty interventions across a sufficiently large number of villages over time as the dynamics of asset accumulation is a rather indirect, time-delayed, and at times ambiguous measure of poverty.

Assessments of poverty can also be constrained by the survey design. Findings across surveys can be dramatically different due to design elements such as adjustments for non-monetary income, choice of deflators, or recall periods. Importantly, in large surveys, the sample size at the level of the Primary Sampling Unit (PSU) implies that poverty assessment is possible only at highly aggregative levels of analysis⁹. Household surveys both “in design” (to the extent that sampling

⁹For example, in the 2011/12 HBS, 26 households were randomly selected in each PSU and 4130 households surveyed in 160 PSUs in rural Tanzania (NBS, 2014: p. 2, Table 1.1). There were roughly 6.2 million rural households in 2012 (URT, 2014: p. 2) so that 26 households represented about 38750 households.

frames become outdated) and “in practice” (difficult to reach nomadic or semi-nomadic households) also miss certain sub-populations including the “poorest of the poor” (Carr-Hill, 2013: p. 32). Our imputed income approach presented below addresses many of the concerns raised above.

3. Our Approach to Assessing Poverty Rights Formalization in Rural Tanzania

Our research is concerned with independently assessing property-rights formalization as a poverty-reduction intervention in rural Tanzania. We use an approach where reliable information can be gathered from village households revisited five years or so apart to support longitudinal analysis. In the following discussion, we first explain the study design, and then outline our household income measure, imputed income, offering some perspectives on its validity for this purpose. Finally, we demonstrate its effectiveness empirically by relating changes in poverty to changes in titling.

3.1. The Study Design

In our survey, households are sampled at the village level, the level at which titling is governed and programs are initiated. Analysis is thus possible at a greater level of disaggregation compared to data from national household budget surveys. This also addresses the issue of dated sampling frames, since village lists of households are reasonably current, and if not readily available, easily drawn up by the village head. Careful selection of case study villages is also possible, based on comparable districts, differing ecological zones, livelihood patterns (agriculturalists, pastoralists, hunter-gatherers), proximity to state farms and national parks, access to irrigation, cash versus subsistence crops, access to roads and markets, village history (Ujamaa or traditional) and evidence of titling programs. Accordingly, we believe our study design is useful for successful monitoring of titling initiatives.

Forty villages in rural Tanzania representing a diversity of ecological, cultural, and agricultural zones were selected in five regions, Dodoma, Kigoma, Manyara, Mbeya and Songwe. In each region, two districts were selected and within each district, five villages were selected¹⁰. About fifty heads of households were randomly selected from an administrative list of households available at the village level, with the number of respondents selected proportional to sub-village size¹¹. If, for example, 1000 households were divided up into four sub-villages of 100 people each and one large sub-village of 600 people, then we would choose the 20th person from each smaller sub-village to get 5 from each sub-village and 30

¹⁰Songwe was part of Mbeya until 2016 when the western part of Mbeya was designated as the separate region of Songwe. One of two districts identified for Mbeya at the start of the study in 2009 is now in Songwe.

¹¹In part we selected a conservative sample size for a population proportion (of poor) of 1/2. At a 95% confidence level and a sample size of 50, the margin of error is about 14% based on 1000 households. We felt this should provide for sufficient variation within a village while keeping the survey work manageable. Increasing the sample size by 50% (to 75) lowers the margin of error to about 11% but dramatically increased the costs.

from the larger sub-village. In the case of absence, an alternate household was selected from the name below the one randomly chosen. In some cases, when there was insufficient representation of female heads of households and pastoralists, additional households were selected randomly from a list of eligible households. The Wave 1 sample comprised 2027 randomly selected households visited between the years 2010 to 2016, while the Wave 2 sample comprised 761 households re-interviewed between 2016 and 2019¹².

Support for our village-based sampling design can be seen in our measure of household size. Defining a household, determining its size, and assessing its stability are complex issues, generating an extensive literature particularly around poverty levels (Randall & Coast, 2015). In our study, we asked the respondent about the total “number of people in the household” with its reliability checked by details on type of household membership (such as children and grandparents). Although our definition differs from that used in the 2012 census¹³, average household size by village was correlated with average household size in the corresponding census ward ($r = 0.55, p < 0.00$).

3.2. Imputed Income, Our Measure of Rural Household Income

An appropriate measure must aim to capture all the household’s productive activities that could benefit from the proposed interventions. This is true especially for rural Tanzania as it supports a wide variety of agricultural activities, a result of its varied ecology “ranging from a dry central plateau with mean rainfall under 500 mm, to highland areas with up to 2500 mm per annum” (Raikes, 1986: p. 107). The measure must also include own-consumption production. Rural households produce food, whether crops or livestock, and consume a portion of it, falling under the descriptor “subsistence agriculture.” Accordingly, an appropriate measure would combine income imputed from crops and livestock and income from other sources such as wages, rent and businesses. To impute income from crops and livestock, the amount sold and the amount consumed for each crop grown and each type of livestock reared over the previous year is recorded for each household. The total household income is then referred to simply as “imputed income.”

The contribution to imputed income from crops (sold and consumed) was 75.4 percent, from livestock (sold and consumed) 9.7 percent and from other sources 14.8 percent. The significance of crops and livestock in household income is to be expected for rural households, but it is notable that the survey also captured the presence of households that relied on other sources of income. Furthermore, considerable variation in these sources of income were observed within, and across villages, in all regions. These observations provide further support for both our

¹²Only about a third of the original sample had been visited by 2019, constrained by issues such as the need to identify villages that embarked on titling programs since Wave 1 and locating the same respondents about six years later.

¹³A household refers to “a person or group of persons who reside in the same homestead/compound but not necessarily in the same dwelling unit, have same cooking arrangements, and are answerable to the same household head” (URT, 2013: xix).

imputed income measure and the study design.

3.3. Perspectives on Our Imputed Income Measure

Income imputed from production of crops and livestock is an indicator of rural long-term income. The approach treats production for sales and consumption equally, and thereby includes savings (that is, income not consumed). Own-consumption information is combined with any part of income allocated to acquiring assets, and the resulting imputed income represents the household's command over its resources to use as it wants. Self-valuation of wealth and how to generate income is implicit in choice of crops and/or livestock given environmental conditions. Imputed income is not affected by consumption preferences, instead demonstrating the degree of sustainability of the income sources of the household. Moreover, it incorporates the sources of the household income rather than just its level as indicated by consumption expenditures and is thus a better measure of the impact of an intervention. For example, the imputed income elasticity of land owned implicitly includes the effect of changes in land ownership arising from the use of land for own-consumption.

The valuation of crops and livestock is based on prices at sale or, in their absence, the average village prices at the time of study, which is an indication of how the market values the household's crops and/or livestock. Valuing unprocessed produce this way is easier to reference compared to the consumption approach, where typically regional market prices are used to get valuations of own-consumption to be added to income obtained from consumption expenditures. Furthermore, since all production, whether sold or consumed, is valued at the same set of prices, imputed income is a consistent quantifiable measure based on agricultural production.

Imputed income provides reliable information on a household's productive activities for several reasons. To be comprehensive, the measure must include production not traded in the marketplace, and we use the price that would have been obtained if production was traded in the marketplace to impute the value of production. The recall of a year addresses the irregularities in agricultural income over a year, including seasonal effects. Moreover, a twelve-month recall may even be advantageous, as villagers find it easier to remember crop or livestock details rather than non-monetary expenditures. We expect that most people will have a better recall of how many bags of produce they obtained in their fields than, say, the number of minutes for their phones they purchased over the same period. In discussing the measurement of productivity, [Carletto et al. \(2015: p. 140\)](#) observe that "it is rather simple for farmers to recall harvested quantities and revenues" of high value marketed crops but point to problems with extended-harvest crops like cassava, collection units (like bags, heaps, etc.) and form of bagged crop (maize meal, corn cobs, nuggets, etc.). However, our method avoids these problems since information is collected for the household and is based on their form of bagged crop. In addition, our focus is on income not productivity which allows us to

utilize the price per bag by crop type harvested if it is sold or consumed without worrying about the exact weight of each bag.

The use of imputed income to measure household income reduces the well-known problems of non-response or understating of reported income, providing valuable support for the validity of our measure. Imputed income was computed for 1923 of 2027 Wave 1 households, giving a non-response rate of about 5.1 percent. Respondents were also asked to self-report their household income from all sources. Missing values were not uncommon with occasionally values missing for all sources of income, yielding a non-response rate of 28.2 percent for total income that aligns closely to the 20 - 40 percent range observed in other income studies (Yan et al., 2010: p. 145). The non-response rate is remarkably lower for our imputed income measure and may be due to the “individual-level motivational factors” (Yan et al., 2010: p. 146) that encourage response inherent in its capture of the household’s productive activities.

In summary, imputed income is an appropriate, reliable and valid measure of household income that can support a variety of analyses. Furthermore, since we return to survey the respondents several years later, and use the same method to compute imputed income, changes in imputed income across regions and time enable consistent, reliable and valid evaluations of rural poverty interventions. Such data, encompassing changes in imputed income (due to say, rising labor and rental income) and land ownership (such as landlessness and size of land holdings), can also inform studies on social class and poverty.

3.4. An Illustration: Assessing Property Rights Formalization as a Poverty Intervention

We illustrate our approach by assessing the effect of property rights formalization on poverty alleviation. Property rights formalization (titling) is indicated by the ownership of a CCRO. The poverty level is indicated by the percentage of households with imputed incomes per capita below a poverty line. We examine change in poverty level and ownership of a CCRO for the same households surveyed in Waves 1 and 2.

Published poverty lines for Tanzania (MoFP-PED, 2020: p. 99) reflect contemporaneous consumption based on household expenditures, prices and price deflators obtained in nationally representative surveys (Haughton & Khandker, 2009). These lines do not just change as consumption patterns change but also at any given point of time are the same across all rural and urban locations. We prefer instead a simple standard that captures variation across our study locations. A study-based minimum nutritional needs poverty line by region was obtained by using the cost of a common staple in Tanzania’s rural diet, maize¹⁴. The argument is that if the income of a household is less than the cost of the minimum daily calory diet based on maize, it is unlikely to have the means to afford a better-

¹⁴There is no greater source of calories in Tanzania than maize. Overall, it is estimated to be the source of 40% of calories in the country (Cochrane & D’Souza, 2015).

balanced diet.

We recognize that the selection of the price of maize is central to our poverty estimates. We used the annual average regional retail price rather than the annual highest retail price usually observed in the non-harvest season. On the other hand, the household's (imputed) income from crops and livestock is based on sell (market) prices. Hence, our poverty estimates are conservative due to price and diet selections. We also note that our estimates are not directly comparable to those estimated from the HBS and NPS, since study design, deflators and poverty lines are different¹⁵. As we demonstrate below, the strength of our estimates is that they facilitate robust dynamic evaluations of rural poverty interventions. Changes in real household income per capita across time reflect changes in the economic environment the household faces, whether from household, village or external reasons. When compared to a real poverty line, it thus provides a valid assessment of the impact of a poverty intervention.

There were 566 households with information on imputed income, household size and possession of a CCRO in the two Waves five to seven years apart depending on re-interview dates. A household was coded as being below the maize poverty line (MPL) if its real daily imputed income per capita in 2019 Tanzanian shillings¹⁶ was less than the corresponding 2019 regional average price for maize per person valued at 2019 market prices¹⁷. The majority (54.2%) of these households remained above the MPL in both Waves, while the percentage below the MPL decreased between Waves 1 and 2 (35.3% to 28.4%), showing a decrease in the percentage poor by Wave 2. The majority (85.0%) also did not have a CCRO in both Waves, although the percentage with a CCRO more than doubled between Waves 1 and 2 (4.6% to 10.4%)¹⁸.

Table 1 shows the percentage distribution of change in poverty status by change in CCRO ownership status between Waves 1 and 2. Poverty status is categorized into four groups, a) those who remained poor (below the MPL in both Waves), b)

¹⁵Nationally representative poverty estimates such as from the HBS or NPS are obtained from much higher levels of aggregation and are not representative of villages, which is the level at which our respondents were sampled.

¹⁶These were obtained by first getting real values of annual imputed income after adjusting with the Consumer Price Index (CPI for 2019, base 2010). Daily figures were obtained by dividing by 365, and per capita values by dividing by household size.

¹⁷One kilogram of dried corn provides 3620 kcal (Lukmanji et al, 2008: p. 20), while the average dietary needs per person is taken to be 2200 kilocalories per day (USDA & USDHHS, 2020: p. 77). The latter is conservative considering not just active men and women but also children and elderly in a household. The dietary needs figure then is 0.61 kilogram of maize per day. The amount of income per capita needed is then 0.61 of the retail price per kilogram of maize in the nearest market. The average retail price for 2019 was computed from data on knoema.com. Data was available for Mbeya and Songwe (Tsh 216.63), whereas for Manyara we used Arusha data (Tsh 549.06), for Kigoma we used Mwanza data (Tsh 376.90) and for Dodoma retail prices were approximated from available wholesale prices based on the mark-up computed from Iringa data (Tsh 331.29).

¹⁸Our Wave 2 figure for CCRO holders (10.4%) is close to the 2020 NPS figure for Rural Tanzania (10.5%) for a plot cultivated in the last short rainy season. Computed from data downloaded from National Bureau of Statistics (Ministry of Finance and Planning). Tanzania-National Panel Survey 2020-2021, Wave 5 (NPSR5 2020-2021). Ref: TZA_2020_NPS-R5_v01_M.
<https://microdata.worldbank.org/index.php/catalog/5639/>.

those who became poor (dropped below the MPL in Wave 2), c) those who became non-poor (crossed above the MPL in Wave 2) and d) those who remained non-poor (above the MPL in both Waves). CCRO ownership status is categorized into three groups, a) CCRO_00, households that had no CCRO in both Waves¹⁹, b) CCRO_01, households that had gained a CCRO by Wave 2, and c) CCRO_11, households that had a CCRO in both Waves.

Table 1. Percentage distribution of change in poverty status by change in CCRO ownership status of households between Waves 1 and 2.

Change in CCRO Ownership Status of Households	Change in Poverty Status of Households				Total (% , number)
	Remained poor (below MPL in both Waves)	Became poor (dropped below MPL in Wave 2)	Became non-poor (crossed above MPL in Wave 2)	Remained non-poor (above MPL in both Waves)	
CCRO_00 Had no CCRO in both Waves (%)	19.8	9.6	18.1	52.5	100 (481)
CCRO_01 Had CCRO only in Wave 2 (%)	3.4	11.9	22.0	62.7	100 (59)
CCRO_11 Had CCRO in both Waves (%)	7.7	23.1	3.9	65.4	100 (26)
All categories (%)	17.5	10.4	17.8	54.2	100 (566)

A majority of households remained non-poor irrespective of CCRO ownership status, with the biggest majority as is to be expected observed for those who had a CCRO in both Waves (CCRO_11, 65.4% compared to CCRO_01, 62.7% and CCRO_00, 52.5%). The percentage of households that remained poor was also, as expected, greatest among those who had no CCRO in both Waves (CCRO_00, 19.8% compared to CCRO_01, 3.4% and CCRO_11, 7.7%). Moreover, households that had gained a CCRO by Wave 2 were slightly more likely to have become non-poor compared to households that had no CCROs in both Waves (CCRO_01, 22.0% compared to CCRO_00, 18.1%). On the other hand, and importantly, contrasting households that had no CCRO in both Waves with those that had a CCRO in both Waves, among the latter, the percentage that became non-poor was lower (CCRO_00, 18.1% compared to CCRO_11, 3.9%), and the percentage of households that became poor was higher (CCRO_00, 9.6% compared to CCRO_11, 23.1%).

We expect that the benefit of a CCRO, say for infrequent actions like asset sale or as collateral, is likely observable only after a CCRO is held for a period of time. The greatest impact then should be seen among households that had a CCRO in

¹⁹A small number of respondents who reported having a CCRO in Wave 1 did not have one in Wave 2. They have been included in the group with no CCRO in both Waves, as it likely that the process for getting a CCRO had been started at the time of the Wave 1 interview but was not completed by Wave 2.

both Waves. Contrary to expectations, however, these households were more likely to not rise out of poverty or become poor compared to households that had no CCROs in both Waves.

4. Concluding Remarks

This paper reported on our approach to the assessment of poverty interventions, with specific focus on property rights formalization in rural Tanzania. We argue that such assessment should incorporate the intervention's pathways that are expected to lead to poverty reduction. Our approach to assessing property rights formalization in rural Tanzania recognizes these pathways, especially since titling is implemented at the village level and impacts a rural household through its productive activities. The household income measure—imputed income—takes sales and consumption of crops and livestock valued at household and/or village prices and adds them to other sources of formal and informal income. Imputed income thus effectively quantifies the productive activities of a rural household assessed at prices in markets close to respondent's home. It also captures long-term income by implicitly incorporating savings and sustainability of the household's income sources. Our data, across villages, regions and time, show low non-response and considerable variation. Imputed income is a simple and reliable metric that supports independent assessment of poverty reduction interventions, such as titling, by classifying the poor based on productive activities. It thereby lessens the need to use publicly available household income data generated for a different purpose or by agencies that might have a vested interest in demonstrating policy success or failure (Stein et al., 2021).

Our approach to assessing a rural poverty intervention program is reliable and valid. The poverty estimates using imputed income and the MPL provide a conservative assessment. The approach takes into consideration the pathways to poverty reduction that are expected of the intervention. The study design prioritizes sampling at the village level, the level governing the issuance of a CCRO. The imputed income measure captures all the household's productive activities. It is a simple and well-grounded alternative to three commonly used measures of household income, reported income, consumption expenditures and household assets. A CCRO formalizes a household's ownership of a land holding and gains from its use to increase the investment in the land are better observed in imputed income rather than reported income, an inherently unreliable measure that excludes the contribution of own-consumption since it does not encompass all the household's productive activities. A household identified as poor using our imputed income measure would, using the consumption approach, be classified as non-poor if it liquidates assets or draws down savings for household expenses and its expenditure thereby exceeds the MPL. With the asset approach, this same poor household would be classified as non-poor if there is no decrease in its assets, that is, its assets are not liquidated to keep up with household needs.

The study found that the percentage with a CCRO was not high despite almost

two decades of titling programs; in part this is because the process of titling itself is a laborious one fraught with uncertainties (Stein et al., 2016). Most of households that had a CCRO in both Waves were the non-poor, in line with literature that has shown that CCROs, given the costs, favor the wealthy (Cotula et al., 2004; Meinzen-Dick & Mwangi, 2008; Obeng-Odoom, 2011; Persha et al., 2024). While a few households that gained a CCRO were poor, it is likely that their acquisition of a CCRO was the result of external titling efforts. Saliently, De Soto's argument that formalizing land ownership helps in poverty alleviation is not supported. Our results show that holding a CCRO across time does not preclude a household from *remaining poor or becoming poor*. This finding is likely not causal but coincidental since other proximate factors affect income, such as prices, market access, weather, irrigation, fertilizer or quality of seed. A household with a CCRO may not get improved access to credit or may incur new expenses if/when taxes are assessed (Stein et al., 2016). It is generally assumed in circles promoting titling that a CCRO provides better opportunities to support productive activities, but as we see above, it may not deliver what is promised.

There has been a long history of donors emphasizing different policies on land reform (Stein, 2020), but there is a scarcity of independent evaluations for these policies, including those targeting poverty reduction initiatives. Our approach, which recognizes and incorporates the pathways through which a poverty intervention is expected to lead to poverty reduction, is a contribution to methodologies evaluating poverty interventions and not poverty measurement. We do not aim to replace existing approaches, but only to demonstrate that there is an affordable and effective way for researchers to independently measure policy impacts.

Acknowledgements

We are grateful to an anonymous referee for their valuable comments. This work was supported by the University of Michigan, the National Science Foundation, the Royal Danish Embassy in Tanzania, and the Charles Stewart Mott Foundation. This study was made possible through the collaborative efforts of a large number of people, most importantly Linda Kimmel at the Center for Political Studies at the University of Michigan's Institute for Social Research, who has helped process, analyze, and archive project data collected since 2008. We acknowledge local institutional support from St John's University of Tanzania and the Institute of Resource Assessment, University of Dar es Salaam. Our survey team included: Matthew Bukhi, Christopher Enock, Elineema Ezekiel, Sia Gerald, Thabit Jacob, Vedast Makota, Rose Mangilima, Baruani Mshale, Conrad Ndomba, Lydia Nyeme, Emmanuel Sulle, Salome Swai, John Ulumara, and Faida Zacharia. Research assistants who helped code, translate and analyze the data include Evalyne Mkulati, Sandra Nwogu, Kate Owens, and Hannah Schneider. Finally, the over two thousand people we interviewed in the regions of Dodoma, Kigoma, Manyara, Mbeya and Songwe, who welcomed us to their homes and patiently answered our

questions, are the reasons we pursue the fundamental question of “How can poverty be ameliorated?” To all these people and others we have no space to include here, we say “Asanteni sana, tena sana.”

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Askew, K. & Odgaard, R. (2019). Deeds and Misdeeds: Land Titling and Women’s Rights in Tanzania. *New Left Review*, 118, 68-85.
- Askew, K., Maganga, F., Nagaraj, S., Odgaard, R., & Stein, H. (2023). The Lure of Lights and Land in Rural Tanzania. Paper Presented at *The European Conference on African Studies*, 31 May-3 June, Cologne, Germany.
- Beckman, D. (1986). *The World Bank and Poverty in the 1980s: Has the Bank Wavered in Its Commitment?* Finance and Development, 26-29.
- Belghith, N., Lopera, M., Ndip, A., & Karamba, W. (2018). *Analysis of the Mismatch between Tanzania Household Budget Survey and National Panel Survey Data in Poverty & Inequality Levels and Trends*. Policy Research Working Paper 8361, World Bank.
- Bevan, D., Collier, P., Gunning, J. W., Bigsten, A., & Horsnell, P. (1989). *Peasants and Governments: An Economic Analysis*. Clarendon Press.
- Brockington, D., Coast, E., Mdee, A., Howland, O., & Randall, S. (2021). Assets and Domestic Units: Methodological Challenges for Longitudinal Studies of Poverty Dynamics. *The Journal of Peasant Studies*, 48, 159-179.
<https://doi.org/10.1080/03066150.2019.1658079>
- Brockington, D., Howland, O., Loiske, V., Mnzava, M., & Noe, C. (2018). Economic Growth, Rural Assets and Prosperity: Exploring the Implications of a 20-Year Record of Asset Growth in Tanzania. *The Journal of Modern African Studies*, 56, 217-243.
<https://doi.org/10.1017/s0022278x18000186>
- Carletto, C., Jolliffe, D., & Banerjee, R. (2015). From Tragedy to Renaissance: Improving Agricultural Data for Better Policies. *The Journal of Development Studies*, 51, 133-148.
<https://doi.org/10.1080/00220388.2014.968140>
- Carr-Hill, R. (2013). Missing Millions and Measuring Development Progress. *World Development*, 46, 30-44. <https://doi.org/10.1016/j.worlddev.2012.12.017>
- Cochrane, N. & D’Souza, A. (2015). *Measuring Access to Food in Tanzania: A Food Basket Approach*. USDA, Economic Research Service.
<https://www.ers.usda.gov/amber-waves/2015/march/measuring-access-to-food-in-tanzania-a-food-basket-approach>
- Concern Worldwide Tanzania (CWT) (2005). *Rights Based Programmer for the Fulfilment of the Right to Adequate Food and the Right to Land for Poor and Vulnerable Citizens in Mtwara, Iringa and Kilolo Districts, Tanzania: Proposal*.
- Conning, J., & Partha, D. (2007). *Impact Evaluation for Land Property Rights Reforms (English)*. Doing Impact Evaluation Series No. 8. World Bank Group.
- Cotula, L., Toulmin, C., & Hesse, C. (2004). *Land Tenure and Administration in Africa: Lessons of Experience and Emerging Issues*. International Institute for Environment and Development.
- Dabalen, A., Etang, A., Mungai, R., Wambile, A., & Wane, W. (2016). Is Poverty in Africa Overestimated Because of Poor Data? In T. Besley (Ed.), *Contemporary Issues in*

- Development Economics* (pp. 61-89). Palgrave Macmillan.
https://doi.org/10.1057/9781137529749_5
- De Long, J. B., & Shleifer, A. (1993). Princes and Merchants: European City Growth before the Industrial Revolution. *The Journal of Law and Economics*, 36, 671-702.
<https://doi.org/10.1086/467294>
- De Soto, H. (2000). *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*. Basic Books.
- Deaton, A. (2003). Household Surveys, Consumption, and the Measurement of Poverty. *Economic Systems Research*, 15, 135-159.
<https://doi.org/10.1080/0953531032000091144>
- Demsetz, H. (1967). Toward a Theory of Property Rights. *The American Economic Review*, 57, 347-359.
- Everest-Phillips, M. (2008). *The Myth of 'Secure Property Rights': Good Economics as Bad History and Its Impact on International Development*. ODI Strategic Policy Impact and Research Unit London Working Paper 23.
- Haughton, J., & Khandker, S.R. (2009). *Handbook on Poverty and Inequality*. IBRD, World Bank.
- Howe, L. D., Galobardes, B., Matijasevich, A., Gordon, D., Johnston, D., Onwujekwe, O. et al. (2012). Measuring Socio-Economic Position for Epidemiological Studies in Low- and Middle-Income Countries: A Methods of Measurement in Epidemiology Paper. *International Journal of Epidemiology*, 41, 871-886. <https://doi.org/10.1093/ije/dys037>
- Lipton, M. (2010). *Land Reform in Developing Countries: Property Rights and Property Wrongs*. Routledge.
- Lukmanji, Z., Hertzmark, E., Mlingi, N., Assey, V., Ndossi, G. & Fawzi, W. (2008). *Tanzania Food Composition Tables*. Muhimbili University of Health and Allied Sciences (MUHAS) and Tanzania Food and Nutrition Centre, Boston.
- Maganga, F., Askew, K., Odgaard, R., & Stein, H. (2016). Dispossession through Formalization: Tanzania and the G8 Land Agenda in Africa. *Asian Journal of African Studies*, 40, 43-49.
- Maliyamkono, T. L., & Bagachwa, M. S. D. (1990). *Second Economy in Tanzania*. Ohio University Press.
- McCambridge, J., Witton, J., & Elbourne, D. R. (2014). Systematic Review of the Hawthorne Effect: New Concepts Are Needed to Study Research Participation Effects. *Journal of Clinical Epidemiology*, 67, 267-277. <https://doi.org/10.1016/j.jclinepi.2013.08.015>
- Meinzen-Dick, R., & Mwangi, E. (2008). Cutting the Web of Interests: Pitfalls of Formalizing Property Rights. *Land Use Policy*, 26, 36-43.
<https://doi.org/10.1016/j.landusepol.2007.06.003>
- Meyer, B. D., & Sullivan, J. X. (2003). Measuring the Well-Being of the Poor Using Income and Consumption. *The Journal of Human Resources*, 38, 1180-1220.
- Ministry of Finance & Planning-Poverty Eradication Division [Tanzania Mainland] (MoFP-PED), National Bureau of Statistics (NBS) and the World Bank (2020). *Tanzania Mainland Household Budget Survey 2017/18 Final Report*. MoFP-PED, NBS and World Bank.
- Msangi, H. A., Waized, B., Löhr, K., Sieber, S., & Ndyetabula, D. W. (2022). Development Outcomes of Land Tenure Formalization under Customary and Statutory Land Tenure Systems in Tanzania: A Multinomial Endogenous Switching Regression Approach. *Agriculture & Food Security*, 11, Article No. 66.
<https://doi.org/10.1186/s40066-022-00403-3>

- National Bureau of Statistics, Tanzania (NBS) (2002). *Household Budget Survey, 2000/01*. NBS.
- National Bureau of Statistics, Tanzania (NBS) (2014). *Tanzania Household Budget Survey 2011/12*. NBS.
- North, D. C. (1981) *Structure and Change in Economic History*. W. W. Norton and Co.
- North, D. C., & Weingast, B. R. (1989). Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England. *The Journal of Economic History*, 49, 803-832. <https://doi.org/10.1017/s0022050700009451>
- Obeng-Odoom, F. (2011). Land Reforms in Africa: Theory, Practice, and Outcome. *Habitat International*, 36, 161-170. <https://doi.org/10.1016/j.habitatint.2011.07.001>
- Odgaard, R. (2002). Scrambling for Land in Tanzania: Processes of Formalisation and Legitimation of Land Rights. *The European Journal of Development Research*, 14, 71-88. <https://doi.org/10.1080/714000434>
- Persha, L., Panfil, Y., Sherman, S., Mpelembe, M. I., & Rutizibwa, M. (2024). *Demand for Documentation Study: Who Pays for Land Documentation, and Why?* United States Agency for International Development (USAID).
- Ponte, S., & Brockington, D. (2020). From Pyramid to Pointed Egg? A 20-Year Perspective on Poverty, Prosperity, and Rural Transformation in Tanzania. *African Affairs*, 119, 203-223. <https://doi.org/10.1093/afraf/adaa002>
- Pu, C. J., Lambin, E. F., Kusimakwe, I., Gichia, L., Seme, A., Otupiri, E. et al. (2024). How Poverty Is Measured Impacts Who Gets Classified as Impoverished. *Proceedings of the National Academy of Sciences*, 121, e2316730121. <https://doi.org/10.1073/pnas.2316730121>
- Raikes, P. (1986). Eating the Carrot and Wielding the Stick: The Agricultural Sector in Tanzania. In J. Boesen, K. J. Havnevik, J. Koponen, & R. Odgaard (Eds.), *Tanzania: Crisis and Struggle for Survival* (pp. 105-142). Scandinavian Institute of African Studies.
- Randall, S., & Coast, E. (2015). Poverty in African Households: The Limits of Survey and Census Representations. *The Journal of Development Studies*, 51, 162-177. <https://doi.org/10.1080/00220388.2014.968135>
- Sarris, A. H., & Tinios, P. (1995). Consumption and Poverty in Tanzania in 1976 and 1991: A Comparison Using Survey Data. *World Development*, 23, 1401-1419. [https://doi.org/10.1016/0305-750x\(95\)00054-g](https://doi.org/10.1016/0305-750x(95)00054-g)
- Sarris, A. H., & Van Den Brink, R. (1993). *Economic Policy and Household Welfare during Crisis and Adjustment in Tanzania*. New York University Press
- Sjaastad, E., & Cousins, B. (2008). Formalisation of Land Rights in the South: An Overview. *Land Use Policy*, 26, 1-9. <https://doi.org/10.1016/j.landusepol.2008.05.004>
- Stein, H. (2008). *Beyond the World Bank Agenda: An Institutional Approach to Development*. University of Chicago Press. <https://doi.org/10.7208/chicago/9780226771656.001.0001>
- Stein, H. (2020). Institutional Transformation and Shifting Policy Paradigms: Reflections on Land Reform in Africa. In African Natural Resources Centre (Ed.), *Rethinking Land Reform in Africa: New Ideas, Opportunities and Challenges* (pp. 85-111). Africa Development Bank.
- Stein, H. (2021). Institutionalizing Neoclassical Economics in Africa: Instruments, Ideology and Implications. *Economy and Society*, 50, 120-147. <https://doi.org/10.1080/03085147.2021.1841937>
- Stein, H., Cunningham, S., & Carmody, P. (2021). The Rise of “Behavioral Man”: Randomized Controlled Trials and the “New” Development Agenda. *Human Geography*,

14, 62-75. <https://doi.org/10.1177/1942778620987068>

- Stein, H., Maganga, F. P., Odgaard, R., Askew, K., & Cunningham, S. (2016). The Formal Divide: Customary Rights and the Allocation of Credit to Agriculture in Tanzania. *The Journal of Development Studies*, 52, 1306-1319. <https://doi.org/10.1080/00220388.2016.1146701>
- Stewart, F., & Van Der Geest, W. (1995). *Adjustment and Social Funds: Political Panacea or Effective Poverty Reduction*. ILO Employment Papers, No. 2.
- Svendsen, K. E. (1986). The Creation of Macroeconomic Imbalances and a Structural Crisis. In J. Boesen, K. J. Havnevik, J. Koponen, & R. Odgaard (Eds.), *Tanzania: Crisis and Struggle for Survival* (pp: 59-78). Scandinavian Institute of African Studies.
- U.S. Department of Agriculture (USDA) & U.S. Department of Health and Human Services (USDHHS) (2020). *Dietary Guidelines for Americans, 2020-2025* (9th Ed.). USDA & USDHHS.
- United Nations Development Program (UNDP) (2024). *Human Development Report, 2023/2024: Breaking the Gridlock: Reimagining Cooperation in a Polarized World*. UNDP. <https://doi.org/10.18356/9789213588703>
- United Republic of Tanzania (URT) (2013). *2012 Population and Housing Census*. National Bureau of Statistics.
- United Republic of Tanzania (URT) (2014). *Basic Demographic and Socio-Economic Profile: Key Findings, 2012 Population and Housing Census*. National Bureau of Statistics.
- United Republic of Tanzania (URT) (2021). *Hotuba ya Waziri wa Ardhi, Nyumba na Maendeleo ya Makazi, Mheshimiwa William V. Lukuvi (MB.), Akiwasilisha Bungeni Makadirio ya Mapato na Matumizi ya Wizara kwa Mwaka 2021/22*. https://asdp.pmo.go.tz/uploads/HOTUBA_YA_WIZARA_YA_ARDHI_2021.22_FINAL-CHAPA_DODOMA_TEXT.pdf
- United Republic of Tanzania (URT) (2022). *Hotuba ya Waziri wa Ardhi, Nyumba na Maendeleo ya Makazi, Mheshimiwa Dkt. Angeline S. L. Mabula (MB.), Akiwasilisha Bungeni Makadirio ya Mapato na Matumizi ya Wizara kwa Mwaka 2022/23*. <https://www.lands.go.tz/uploads/notices/sw1681983001-hotuba%20comp.pdf>
- United Republic of Tanzania (URT) (2023). *Hotuba ya Waziri wa Ardhi, Nyumba na Maendeleo ya Makazi, Mheshimiwa Dkt. Angeline S. L. Mabula (MB.), Akiwasilisha Bungeni Makadirio ya Mapato na Matumizi ya Wizara kwa Mwaka 2023/24*. <http://www.maelezo.go.tz/storage/app/uploads/public/647/471/be3/647471be35904838301165.pdf>
- United Republic of Tanzania (URT) (2024). *Muhtasari wa Hotuba ya Waziri wa Ardhi, Nyumba na Maendeleo ya Makazi, Mheshimiwa Jerry W. Silaa (MB.), Akiwasilisha Bungeni Makadirio ya Mapato na Matumizi ya Wizara kwa Mwaka 2024/25*. <https://www.lands.go.tz/uploads/speeches/sw1716542319-23.05.2024%20MUHTA-SARI%20WA%20HOTUBA%20YA%20WAR%202024.25.pdf>
- van Ginneken, W., & Park, J. (1984). *Generating Internationally Comparable Income Distribution Estimates*. International Labour Organization.
- World Bank (1990). *World Development Report 1990: Poverty*. Oxford University Press.
- World Bank (2015). *Tanzania Mainland Poverty Assessment*. World Bank.
- World Bank (2020). *Tanzania Mainland Poverty Assessment: Tanzania's Path to Poverty Reduction and Pro Poor Growth (Volume One)*. World Bank.
- Yan, T., Curtin, R., & Jans, M. (2010). Trends in Income Nonresponse Over Two Decades. *Journal of Official Statistics*, 26, 145-164.