A global perspective on development paths for inclusive rural transformation

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Abstract

We examine in this paper how and where rural transformation is occurring to gain a better understanding of the factors that lead to more inclusive transformation processes. By this approach, we aim to provide new insights on how to reduce the factors that push rural people out of their home areas, by exploring the role small cities and towns play in the transformation process, which, differently from megacities, are increasingly recognized to create strong rural-urban linkages. However, rural transformation outcomes are also determined by rural governance and institutional arrangements. Thus we widened the perspective by incorporating the dimension of institutions. We developed an ad hoc conceptual framework to explore the correlations between these factors and an indicator of rural inclusiveness expressed as the share of rural non-poor in total population. At the end, we developed a country typology based on the speed of rural transformation and rural inclusiveness. By comparing the rural inclusiveness indicator to its counterpart for urban population, we explored the different paths of transformation available to countries. It is shown that in countries such as China and Vietnam, rural transformation was accompanied by growth in industry and services and so people's exit from poverty has been fast in both rural and urban areas, which is said to be the best path of sustainable and inclusive rural transformation.

Key words: Rural transformation, rural inclusiveness, rural-urban spectrum,

1. Introduction

Rural transformation (RT) typically occurs at the same time as agriculture's relationship to the rest of the economy changes. It is as a process of rising agricultural productivity, increasing commercialization, and diversification of production patterns and rural livelihoods, classically accompanied by improved access to services and infrastructure in rural areas. This implies that RT is typically accompanied by a broader economy-wide structural transformation (ST) and increased urbanization, while at the same time the non-farm economy grows in importance within the rural areas. The most common outcome of the process is a relatively smaller but more productive agricultural sector coupled with larger and more productive industrial and services

sectors. The RT impacts on rural society are profound in terms of poverty, food security, resilience, social structure and culture, and thus the process outcomes are of considerable interest to stakeholders (IFAD, 2016).

The development economics literature suggests that agricultural growth, if broadly shared, has the highest impact on non-farm income and employment (Mellor, 1976). Historical experiences worldwide shows that the path to economic development and wealth creation have been virtually passed through ST. Virtually no country in the world has ever successfully transformed its economy and eradicated poverty without sustained agricultural productivity growth. This means that increased agricultural productivity is a pre-condition for successful RT, but it is not sufficient to guarantee an inclusive RT process. This is confirmed by recent history in some parts of the World. In Latin America, for example, rising agricultural labor productivity has not automatically translated into an inclusive RT and thus the process impacts on poverty reduction and increased food security have been very limited. For this reason, governments intervene supporting safety nets and creating social protection programs to provide income support to the vulnerable people including smallholder farmers (IFAD, 2016).

Urbanization, being at the same time a driver and an outcome of ST, is an essential feature of the transformation process. The level of urbanization varies by region and the least urbanized, Africa and Asia, are urbanizing faster than the other regions. Their urban populations are projected to reach 56 and 64 percent respectively by 2050 (UN, 2015). However, the image we have of urbanization is often linked to large cities, but only about 12 percent of the world's urban population, 453 million people, live in 28 megacities (UN, 2015), while over fifty percent of the world's urban population live in small cities and towns (SCTs).

The importance of SCTs goes beyond their shares of urban population to their role in socio-economic development. For example, two case studies on East Africa suggest that SCTs are leading the agglomeration growth mainly by diversifying their economic bases and strengthening linkages to rural areas (Ruhiiga 2013; Snyder and Tschirley, 2014). A case study on Tanzania shows that rural economic diversification and moving to SCTs had a greater impact on rural poverty reduction compared to migration to large cities, even though incomes rise comparatively faster in the latter (Christiaensen, De Weerdt, & Todo, 2013). Moreover, Dorosh & Thurlow (2013) argue that growth in SCTs leads to broader economic growth and poverty reduction than growth in large cities. Their study shows that agriculture and small towns have stronger growth and welfare linkages with each other than they do with big cities. Finally, a study by Christiaensen & Todo (2014) finds that in sub-Saharan Africa over the 1980–2004, diversification into rural nonfarm and SCTs activities typically facilitates a more inclusive, even if slower, growth process. They refer to the part of the spectrum from farmgate to SCTs as the "missing middle" and highlight its importance in poverty reduction relative to rapid metropolization.

The impact on rural incomes of the proximity of urban centers may be because seasonality and underemployment limit incomes from agriculture; thus having SCTs that provide a more

diversified economy can help expand employment opportunities by adding hours even if these jobs are in lower productivity services. Another relevant role is the demand side of the urban centers and its impact on poverty reduction, which is seen to be far greater when it occurs in a relatively decentralized fashion, featuring robust growth in SCTs near production areas. Such growth favors stronger growth linkages with rural areas, and makes the move to a better-off existence more accessible to a wider range of rural households (Christiaensen, De Weerdt and Todo, 2013; World Bank, 2009).

However, large cities still receive disproportionately more research coverage as well as public investment. Urbanization researchers usually seek generalizable urban models and have neglected SCTs and their roles in understanding the various urbanization patterns and their different socio-economic impacts (Bell & Jayne, 2009). Ferré, Ferreira & Lanjouw (2012), in 8 countries across the world, find that access to basic infrastructure services is much lower in SCTs than in the metropoles. Moreover, Coulombe & Lanjouw (2013) found the same result in 12 sub-Saharan African countries, prompting them to voice the possible existence of a "metropolitan bias".

Part of the well- functioning process of transmission of economic and social linkages through different areas of the territory is based on the role of governance and public institutions in RT that must start with the provision of rural public goods, and, where possible overcome market failures. Tsakok (2011) finds that the conditions common to all successful RTs are linked to (1) macroeconomic and political stability, (2) the ability of research and extension messages to reach farmers, (3) access to lucrative markets, (4) an ownership that rewards individual initiatives, and (5) employment-creating non- agricultural sectors. Out of the five conditions, the first four are inextricably linked to institutions and governance. Governance and institutions also matter for the functioning of markets and their roles in RT (Stifel and Minten 2008, Calderon 2009, Jacoby and Minten 2009, Gollin and Rogerson 2010).

Given the above, we focus in this paper on examining how and where RT is occurring to gain a better understanding of the factors that lead to more inclusive RT. By this approach, we aim to provide new insights on how to reduce the factors that push people out of their home areas. This involves exploring the role of SCTs in the transformation process, which, as mentioned above, are increasingly recognized to create demand patterns with stronger rural-urban linkages offering a wider range of non-farm opportunities to rural population and generating more inclusive RT processes. As the research project is still work in progress, the description of used data and the employed methods as well as the discussion of the results will follow an *ad hoc* manner. This will enable us to explain the sequence of our thoughts and to discuss some intermediary results before they become inputs in further steps.

2. Data and indicators

2.1. Indicators of RT and rural inclusion

It is generally reasonable to assume that when agricultural productivity increases, it will be accompanied by improvements in the rural infrastructure and services, while in the same time; labor gets released from agriculture to the other sectors. Therefore, and following IFAD (2016), we assume that the level of RT can reasonably be captured by the agricultural labor productivity, being the central driver and reflection of the RT. However, an *inclusive* RT is a process where the improvements in agricultural productivity are accompanied by non-farm livelihood opportunities that are accessible to the rural poor, lifting their incomes and reducing the push factors that lead to out-migration. This indicates that a measure of inclusive RT should capture the share of the rural population that is exiting poverty and staying in rural areas, independently of those who decide to migrate to urban centers. Therefore, we adopt another proxy, which is not affected by rural-urban migration. To this end, we use the share of the rural non-poor in the total population (RNP) as a proxy for RT inclusiveness, capturing changes associated with income effects of increased agricultural and alternative rural livelihoods (i.e. share of rural people exiting poverty and staying in rural areas). The indicator is calculated by dividing a country's rural non-poor population by its total population. Hence, a higher RNP indicates a more inclusive RT.

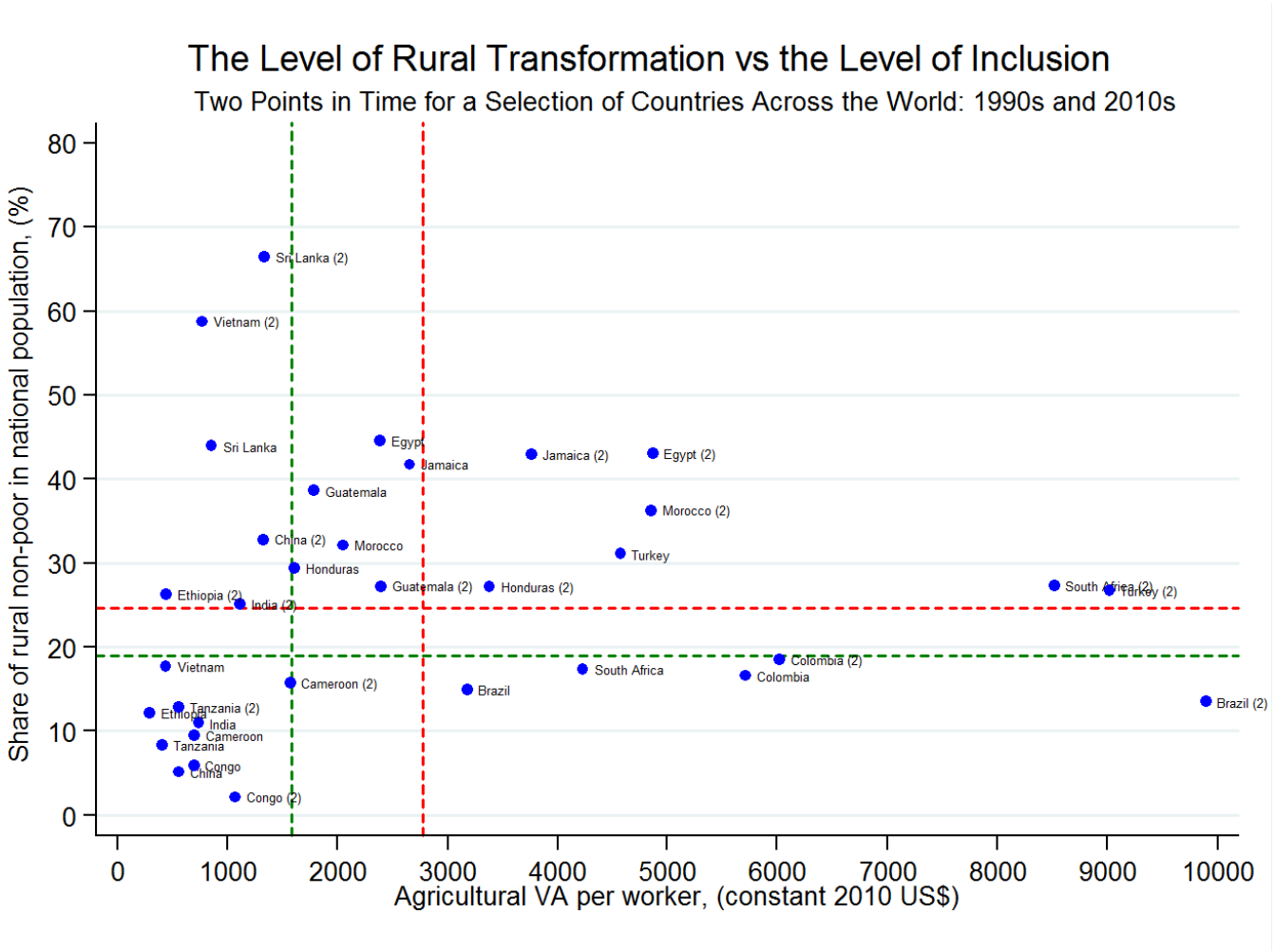
Figure 1 depicts the level of RT vs rural inclusiveness for a selection of countries at two points in time: the 1990s and 2010s. The green and red dotted lines represent the averages (over 71 countries on which we have data). The figure shows that at early stages of transformation, an increase in agricultural productivity will bring about high improvements in rural incomes and thus RNP increases are disproportionately higher than those of agricultural productivity. This what happened over 1990s-2010s in countries at the left-lower corner as China, India, Congo, Tanzania, Cameroon, Ethiopia, and Vietnam, which were all low-income countries in the 1990s as classified by the World Bank (2016). At later stages, growth in industry and service sectors accelerates urbanization expanding the opportunities generated by agglomeration economies in industry and services sectors. Therefore, although RT continues to increase steadily, rural inclusion slows down. This is the case of Egypt, Honduras, Guatemala and Jamaica that were classified as lower middle income countries in the 1990s. In more urbanized countries such as Brazil, Turkey and South Africa, rural inclusion starts to decline with increased RT as more people are exiting rural areas (also the non-poor).

One important thing to observe is how the positions of countries in terms of RT and rural inclusion changed in both directions with substantially varying degrees reflecting not only different initial levels of development, but also different transformation paths, speeds and final outcomes in terms. For example, while Colombia's agricultural productivity has been constant, that of Brazil has tripled over the last two decades, but both remained below global averages in terms of rural

inclusion. On the other hand, Sri Lanka and Viet Nam improvements in agricultural productivity are negligible, but they achieved very high levels of rural inclusion.

Therefore, the rates of change in both indicators vary substantially among countries based on their initial level of development, their resource endowments and their public policies and programs. At the early 1990s, among the 71 countries on which we have data, there were 37 low income countries, 30 low-middle income countries and only 4 upper-middle income countries. These numbers became 21, 28, and 21 respectively, while Chile was the only country that moved to high income country group. Over the two decades, 15 countries moved from the low income group to low-middle income group, while only China has made a fast transition to the Upper-Middle income group. In addition, 17 countries moved from lower to upper middle-income group. Among all countries, those of Sub-Saharan Africa seem to have changed the least. While 22 out of 37 (60%) were from SSA in the 1990s, by now these are 17 out of 21 (80%).

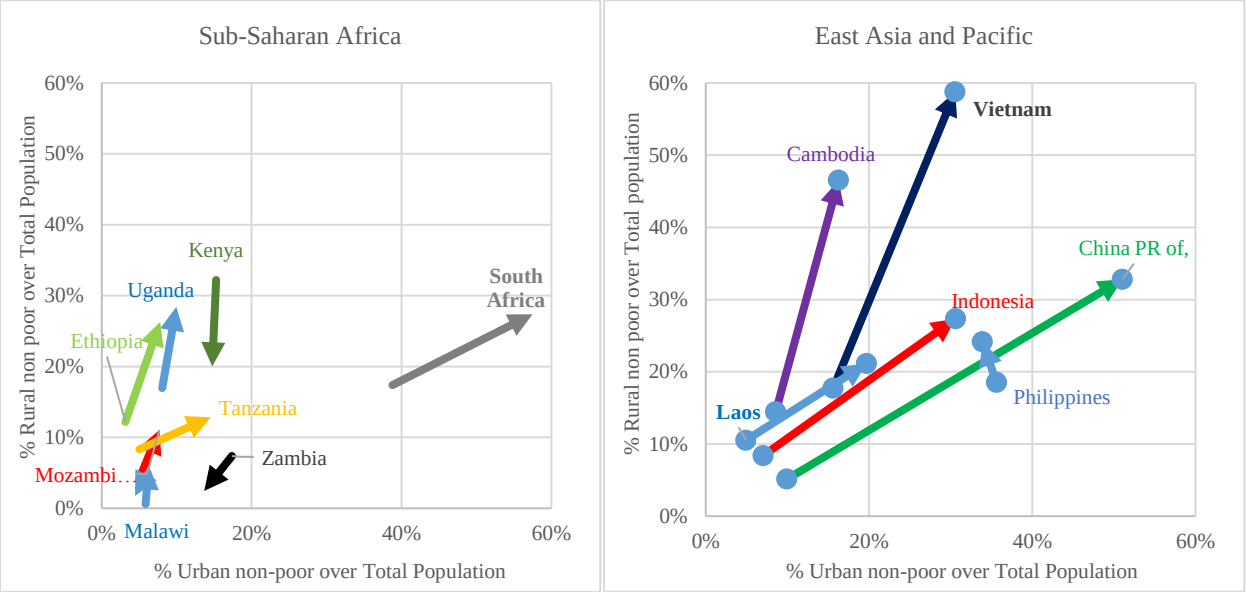
Figure 1. Levels of rural transformation vs level of inclusion for a selection of countries having different levels of transformation (reference years: 1990-1995 based on data availability)



Source: authors' elaboration from World Bank and IFAD (2016)

Despite the declining role of agriculture in all countries in transformation, industrialization – intended as the development of manufacturing, which was a main driver of transformation in many Asian and Latin American countries – is lagging in the late transformers of sub-Saharan Africa. McMillan and Harttgen (2014) report that between 2000 and 2010, 19 African countries saw the share of the labor force in agriculture fall by an average of 11 percent; the decline was most rapid in the economies most dependent on agriculture. However, unlike the case of Asia and Latin America, Africans leaving agriculture are not moving to industry in most cases, but – as noted above – to low productivity informal non-farm activities, generally in the retail trade and services (World Bank, 2007).

Figure 2. Comparison of rural and urban non-poor in total population, 1990s and 2010s



Source: authors' elaborations from World Bank and IFAD (2016)

The move from low-productivity agriculture to the low-productivity services sector in sub-Saharan Africa is not producing substantial increases in household incomes. Although labor that exits agriculture overcomes the seasonality that characterizes farm employment, the increased working hours are not associated with higher productivity. As explained by McCullough (2015), many households and individuals earn more by working more hours, not by increasing their labor productivity. The benefits of this path of transformation, in terms of poverty reduction, have so far been very modest, as shown in Figure 2, which replicates Figure 1 for a selection of countries in East Asia and the Pacific, the region that has undergone the fastest transformations and poverty reductions, and sub-Saharan Africa, where poverty status has changed very little. The arrows in the figure illustrate changes in poverty levels, and indicates the drivers of change – such as rural transformation in the case of Cambodia and urbanization in the case of China.

Most countries in both regions had very similar proportions of non-poor in their total populations in the early 1990s. While that proportion has increased considerably in East Asia and the Pacific since then, in both rural and urban areas, improvements in Sub-Saharan Africa have been modest and in some countries negative. However, poverty reduction in most of East Asia and the Pacific has been accompanied in most countries by a worsening of income distribution, with inequality increasing in both rural and urban areas. For example, in China, which has witnessed the fastest poverty reduction, the Gini index increased by nine points in rural areas (from 30.6 to 39.5) and by 10 points in urban centers (from 25.6 to 35.4) between the 1990s and the current decade. Similar trends are observed in the other countries for which data is available, except Cambodia, where noticeable poverty reduction has been accompanied by a tangible increase in equality in both rural and urban areas (World Bank and IFAD, 2016).

2.2. Governance indicators

The RT outcomes are largely determined by rural governance and institutional arrangements as the latter affect transaction costs, markets development, and access to credit and land, which will have implications for development of income opportunities and how these opportunities are shared within a certain rural community. The Rural Sector Performance Assessments database of IFAD (2017) includes data on governance that cover the following five topics:

- government effectiveness (allocation and management of public resources for rural development;
- regulatory quality (financial services, investment climate, and access to input and product markets);
- rule of law (access to land and to water for agriculture);
- control of corruption (accountability, transparency and corruption in rural areas), and
- voice and accountability (legal framework and dialogue).

Table 1. Descriptive statistics for average scores of governance on government effectiveness, regulatory quality and rule of law (2013)

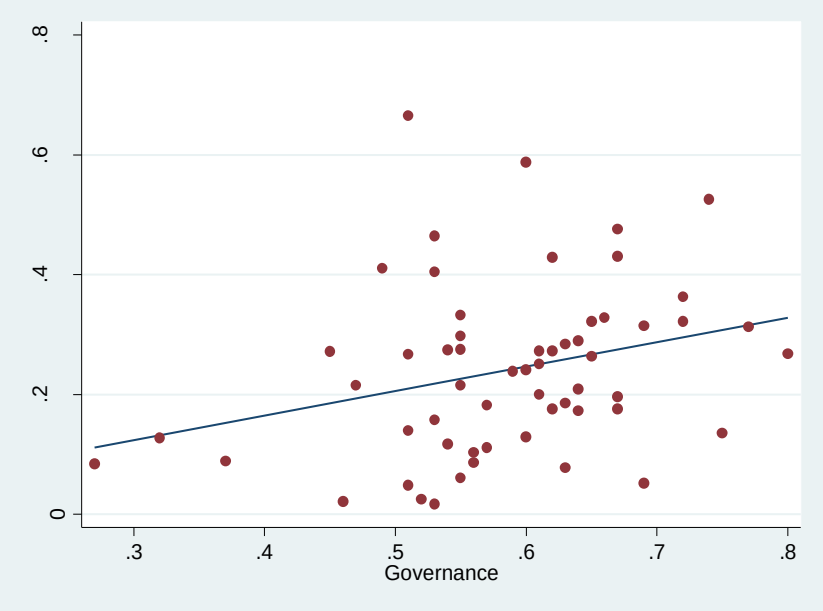
	Mean	Min	Max	Range
All countries	0.57	0.27	0.80	0.53
Upper Middle Income	0.65	0.42	0.80	0.38
Lower Middle Income	0.60	0.33	0.74	0.41
Low income	0.53	0.27	0.73	0.46

Source: authors' elaboration from IFAD (2017)

In our analysis, we select only three topics due to their direct relevance to agricultural development and RT economic processes, which are government effectiveness, regulatory quality, and rule of law. These indicators have been developed as scores ranging from zero to 100 percent. At this phase of the study, we only could consider the averages of these three

indicators to generate one score by country. Data on averages are summarized in Table 1 at both global scale (all countries) but also by country income group. One interesting observation is that as we move by income groups, on average the scores go down along the income level for both minimum and maximum scores, while the range goes up, reflecting that governance gets worse as income level goes down (lower minimum and maximum scores), but in the meanwhile the variation within income group becomes wider (higher range). In Figure 3, we cross-tabulate data on governance with our measure of rural inclusion, and we observe a positive relationship between them.

Figure 3. Relationship between governance and rural inclusiveness



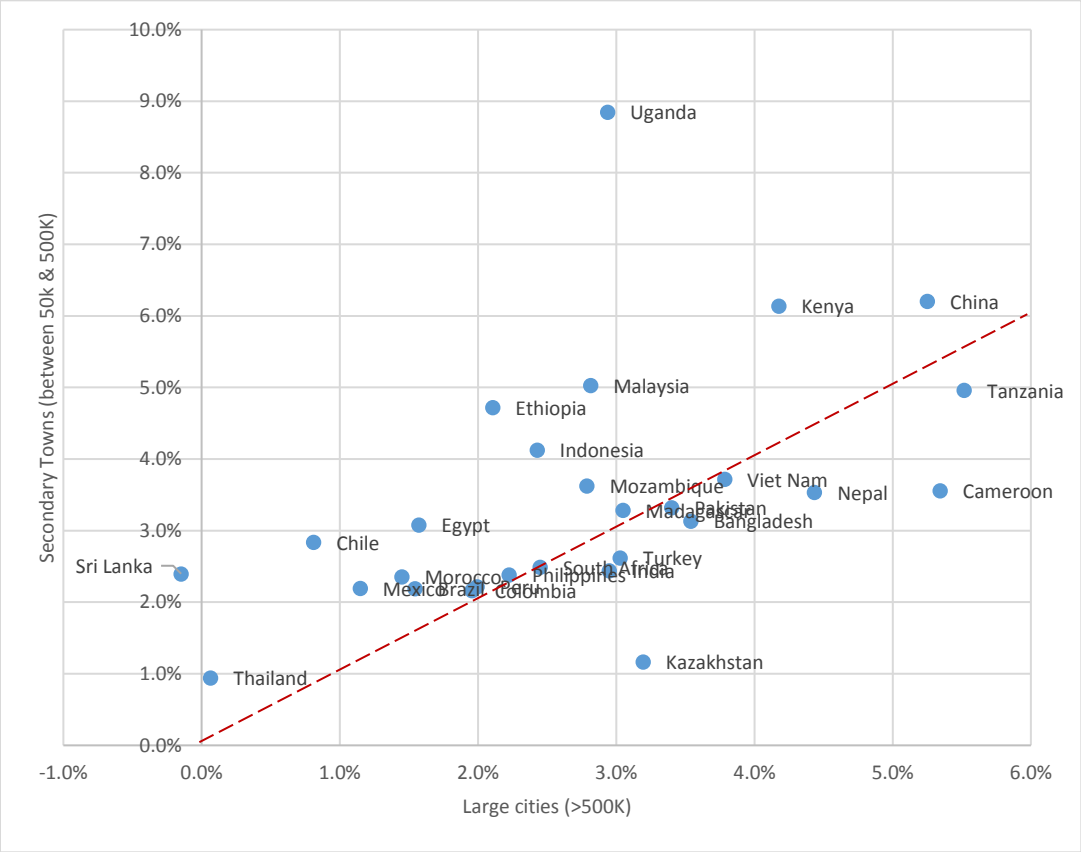
Source: our elaboration from IFAD (2017) and World Bank & IFAD (2016)

2.3. Data and indicators on urbanization: Characterizing agglomeration, geography, and infrastructure

Rapid urbanization, combined with income growth, has been driving the transformation of food systems and markets worldwide. The share of people living in urban areas has risen from 30 percent in 1950 to 54 percent in 2014, and is forecast to reach 66 percent in 2050 (UN, 2015). The popular perception of urbanization is that today's 3.5 billion urban dwellers live in cities akin to New York or New Delhi, when in fact urban areas come in a very wide range of sizes – from megacities to small market towns and administrative centers (Cohen, 2004). Most urban areas are, in fact, comparatively small and nearly half the world's urban population lives in cities of fewer than 500 000 residents (Balk et al., 2012; UN, 2015). In addition, about one in four urban dwellers live in urban areas with 100 000 to 500 000 inhabitants (Balk et al., 2012).

Recent urbanization is happening more in small cities and towns than in megacities for the following reasons. In a sample of countries with population exceeding 15 million (Figure 1.3), and assuming that the sample is representative, the majority (19) have registered higher population growth rates in small cities and towns (above the red line in Figure 4) than in larger cities; they include some very highly populated countries, such as China, Egypt, Ethiopia, Indonesia and Sri Lanka. Only nine countries fall into the second category, those where urban growth occurs mainly in large cities (below the red line in Figure 4). Although this latter category includes some populous countries, such as India, Bangladesh and Pakistan, the growth rates of their large cities are only marginally higher than those of their small cities and towns. Second, in countries with high rural population growth rates, such as most of those in sub-Saharan Africa, West Asia and South Asia, many large rural villages have been reclassified, due to population growth, as small towns, either due to indigenous growth or due to immigration from surrounding rural areas.

Figure 4. Annual population growth in large cities compared to towns in selected countries with populations of more than 15 million (1990s-2010s)*



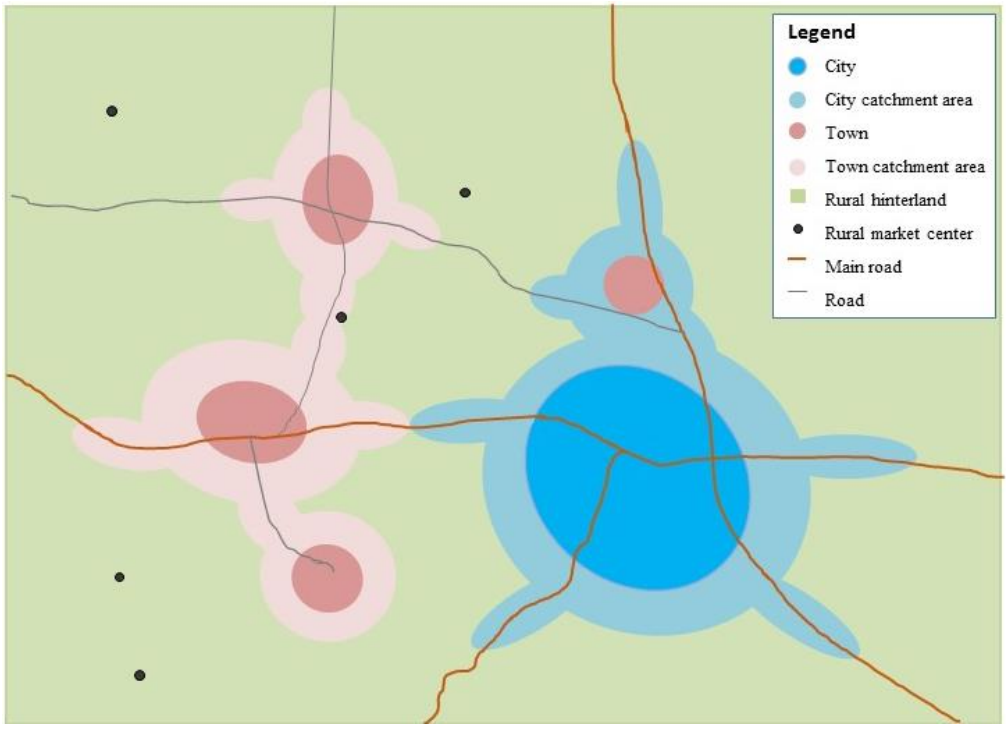
* The selection is based on data availability

Source: This study based on data from the Rural Urban Spectrum (see below)

This new pattern of urbanization has implications for rural and structural transformations and the associated roles of income growth and employment in lifting people out of poverty. In general, urbanization can have a substantial and systematic poverty-reducing effect in surrounding rural areas, mainly through economic linkages rather than through the direct movement of the rural poor to urban areas. Calì and Menon (2012), using district-level data from India, found that urbanization has contributed considerably to poverty reduction in surrounding rural areas, mostly though improved consumer access to agricultural products.

However, looking at urban areas only as an aggregate vis-à-vis rural areas will miss the wide diversity in the urbanization patterns occurring around the world in terms of their relationship with the surrounding rural areas. Thus capturing the full rural-urban spectrum (RUS) of population distribution is necessary to verify the patterns of rural-urban linkages and how they affect RT. Following Christiaensen and Todo (2014), we refer to the part of the spectrum from farm-gate to SCTs as the "missing middle" that is thought to generate a more inclusive RT relative to rapid metropolization. Based on this, the size of urban centers and the distance of rural areas to them are key aspects in RT pathways. This entails distinguishing among rural populations living in immediate proximity of cities and towns, in intermediate locations, and in rural hinterland.

Figure 5. Map illustrating the rural-urban spectrum concept



Source: authors' elaborations

Figure 5 illustrates the concept of the RUS, showing relationships between populations residing in large cities, small cities and towns, their 'catchment areas', and the rural hinterland. To put

this into practice we build on the approach of the Agglomeration Index developed by the World Bank (2009). Using spatially georeferenced data on population density, agglomeration size, and travel time to agglomerate centers, we examine the distribution of population along the RUS.

The procedure to calculate the RUS can be summarized as follows. We first specify a threshold value to each of the three criteria: minimum population size of an urban center, minimum population density, and maximum travel time to the closest urban center. In our study, we adopt 1000 people per km^2 as a minimum density for a settlement to be considered as urban. Travel time is broken up into two categories: one hour of travel time to the closest urban center to identify urban and peri-urban population; and from one to three hours of travel time to identify rural population in proximity of urban centers. What is left will be considered rural hinterland population. To account for agglomeration size, cities and towns are broken up into three sizes: large cities (more than 500,000 people), small cities (between 100,000 and 500,000 people), and towns (between 50,000 and 100,000 people). To the best of our knowledge, data on towns including less than 50,000 inhabitants are not yet available.

Having defined the thresholds, we locate the central points of the urban centers from the GRUMP human settlements database. We then determine the borders of urban centers, rural in proximity of urban centers and rural hinterland based on the three travel times. When a rural area is sufficiently close to two urban centers, priority is given to largest one. These borders are computed from a cost-distance model that estimates travel time over a *cost surface*. This surface has a spatial resolution of approximately 1 km and is derived from GIS data on: (i) the transport network, (ii) off road surfaces derived from land cover data, and (iii) slope and estimates of the average travel speeds for each permutation of these data. After that, we create (1) population number and (2) population density grids at 1 km spatial resolution for year 2007 (based on the average of two global gridded population data sources: the GRUMP and LandScan). This allows the aggregation of the World population of all the grid cells that satisfy all thresholds. The worldwide results of the RUS are shown in Table 2.

Table 2. Distribution of global population in small, medium and large cities and of rural populations by proximity to them, 2007

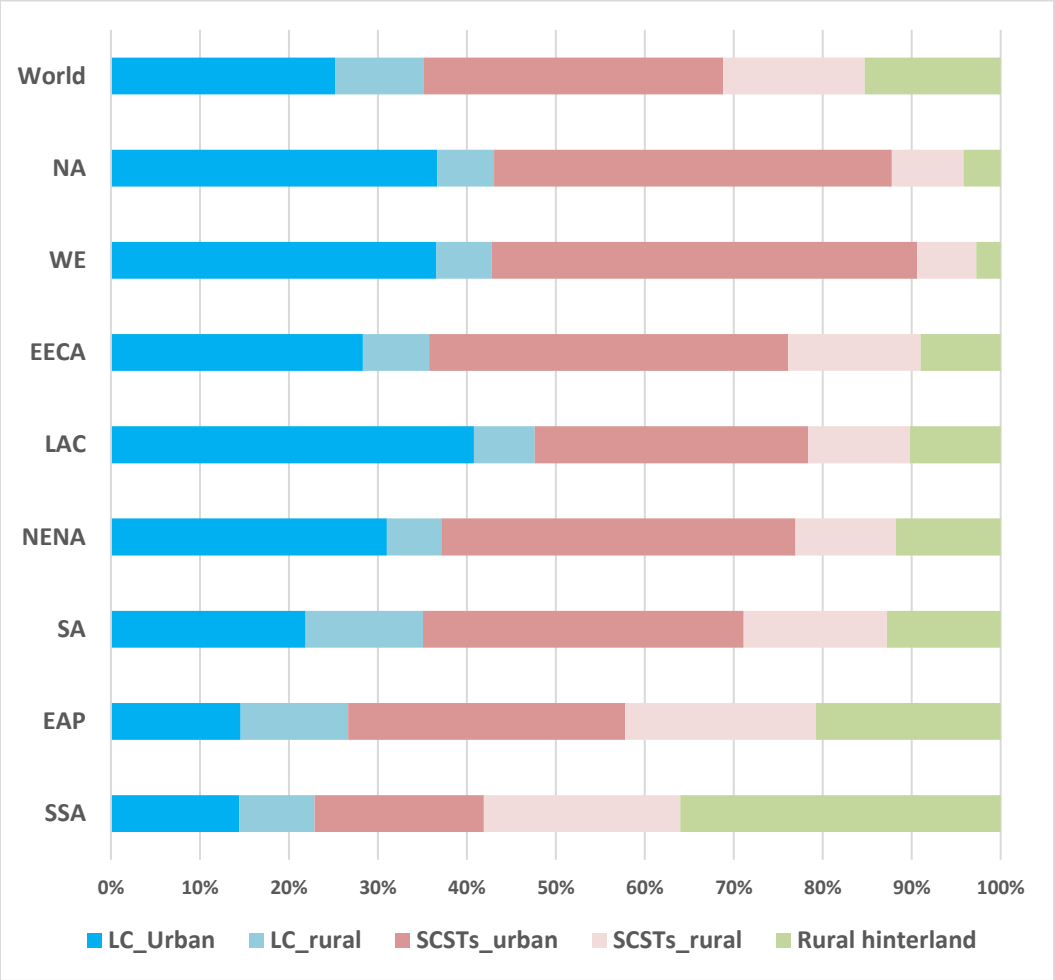
City/town size	Urban and peri-urban (Travel time , < 1 hour)	Proximate (Travel time 1 to 3 hours)	Rural hinterland (Travel time > 3 hours)
	Percentage of global population		
Towns (Population 50,000 - 100,000)	10.2% (HD 6.7 ; LD 3.6)	4.4% (HD 1.9 ; LD 2.5)	15.3% (HD 5.0 ; 10.5)
Small cities Population 100,000-500,000	23.4% (HD 17.8 ; LD:5.6)	11.5% (HD 5.4 ; LD 6.1)	
Large cities (Population above 500,000)	25.2% (HD 22.3 ; LD 2.7)	9.9% (HD 5.2 ; LD 4.6)	

Note: Figures in parenthesis are shares of population living in high density areas (HD) and in lower density areas (LD) with a threshold of 1000 people/km2. Towns of less than 50,000 people which are distributed throughout a country's territory are not captured here as urban or peri-urban (and, hence, implicitly rural people do not gravitate around these smaller agglomerations). This leads to some rural areas exhibiting high population density.

Source: authors' calculations

The urban and peri-urban shares in Table 2 differ from official UN data. This can be seen at the global level where the 'strictly urban' population share – those living in high-density urban areas – amounts to approximately 47 percent, which is lower than the UN estimate for year 2007 of 50 percent. Including peri-urban areas with densities of less than 1 000 people/km2 increases this share to 59 percent, which is higher than the UN estimate. However, the purpose of the RUS is not to determine exactly who is 'urban' or 'rural'; it is rather to understand the relative importance of different agglomeration sizes and the rural population living around them. In this respect, its portrayal is most informative in comparing how countries may differ in their rural-urban structure. This is important in territorial planning where the demographic and geographical characteristics of a country, or of a region within the country, play a central role.

Figure 6. Rural-urban spectrum globally and by region, 2007

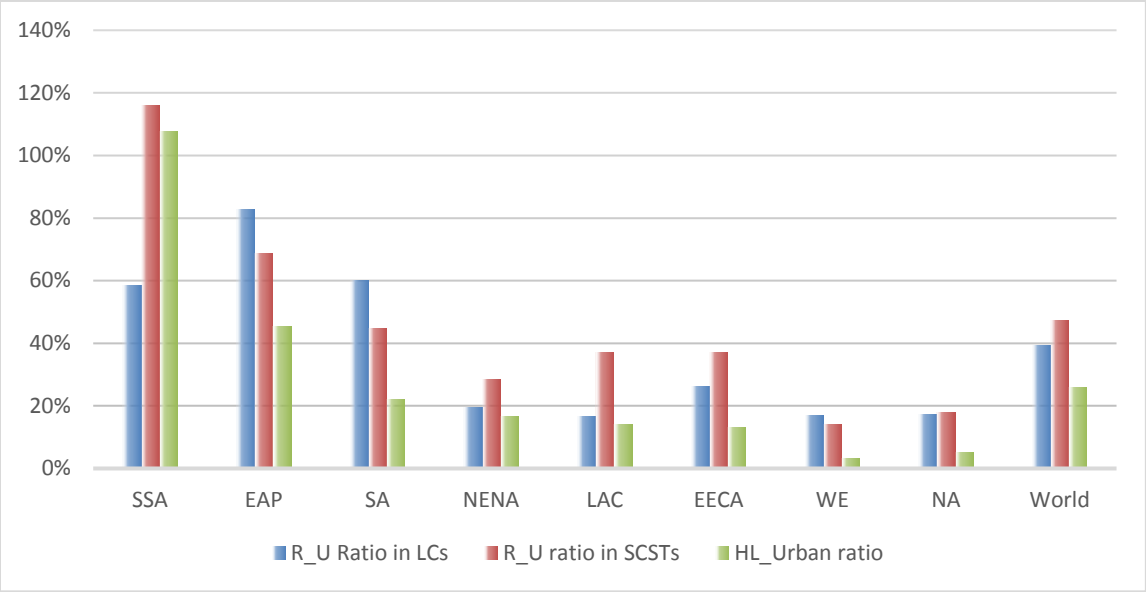


- **LC_Urban**: urban population within one hour travelling time from a large city (greater than 500 000);
- **LC_rural**: rural population residing between one to three hours travelling time from a large city (greater than 500 000);
- **SCSTs_urban**: urban population within one hour travelling time from a small city or secondary town (population between 50 000 and 500 000);
- **SCSTs_rural**: rural population residing between one to three hours travelling time from a small city or secondary town (population between 50 000 and 500 000);
- **Rural hinterland**: rural population residing farther than three hours travelling time from any city center with population of more than 50 000.

Source: authors' calculations and elaboration

Figure 6 shows the rural-urban spectrum for the world and by region. In sub-Saharan, the share of population residing in rural hinterlands, at 36 percent, is strikingly high compared to other regions, while hinterland shares are noticeably low in West Europe and North America (3 percent and 4 percent, respectively). The hinterland share in East Asia and the Pacific is slightly higher than the world average of 15 percent, while in the other regions it ranges from 9 to 13 percent. This indicates that adequate investments in physical infrastructure is important for improving market access for a considerable proportion of rural population in East Asia and the Pacific, but even more so in sub-Saharan Africa.

Figure 7. Rural to urban population ratios for large cities, small cities and towns, and rural hinterlands, globally and by region



R_U Ratio in LCs: the ratio of rural population living around large cities to the associated urban population.
R_U Ration in SCSTs: the ratio of rural population living around SCSTs to the associated urban population
HL_Urban ratio: the ratio of rural hinterland population to the total urban population
Source: SOFA team calculations and elaborations

The RUS also provides insights into the rural labor supply available around agglomerations of different sizes. This is important because increased urbanization and the exit of labor from agriculture into non-farm sectors are two key features of RT. Rural labor supply can be reflected in ratio of the rural population to the urban population of the closest city of reference, whether it is a large city or a small city or a town. This is illustrated in Figure 7 by: the blue columns representing ratios of rural to urban populations for large cities; the red columns representing ratio of rural to urban population for small cities and towns: and green columns for hinterland. However, since rural hinterland populations have no specific city size of reference, we calculate its ratio to total urban population of the country of reference.

As expected, the ratios are highest in sub-Saharan Africa, East Asia and the Pacific, and South Asia, which also have the largest shares of rural population in the total population. However, while small cities and towns have a major role to play in absorbing excess rural labor in sub-Saharan Africa, it seems that large cities are more important for that in Asia. Moreover, while we cannot say from Figure 7 which type of urban centers will be absorbing rural labor from the hinterlands, it is evident that the challenge for the urban sectors and the non-farm economy is greatest in sub-Saharan Africa. All the other regions show similar patterns, underscoring the finding that small cities and towns will play a more important role than large cities in the transformation process.

Nevertheless, the ability of cities and agglomerates of different sizes to absorb rural labor will depend on other factors. It also depends on governance structure and the functioning of institutions that determine the efficiency and the transparency with which public resources and expenditure are allocated among different sectors and territories. The state of infrastructure and services can determine not only the level of opportunities available in cities and towns, but also the strength of rural-urban linkages (Dercon and Hoddinott, 2005). Therefore, it largely determines the size of the rural population that will gravitate around urban centers, with implications for the labor supply in rural areas and demands on natural resources, especially land. The efficient functioning of infrastructure and basic services requires effective institutions and governance structures, which are largely shaped by historical and cultural factors.

3. Rural inclusion: the combined role of potential drivers - preliminary results and discussion

Based on the line of reasoning explained above and the findings from data, we developed a conceptual framework that the combined role of agricultural productivity, governance, geography, and agglomeration size in rural inclusion can be captured by a multiple regression. The theoretical framework can described as:

$$RI = B0 + B1*AGVA + B2*GOV + B3*PSCSTs + B4*PLCs + B5*PHL$$

Where:

RI: is our rural inclusion indicator

AGVA: our measure of RT expressed as agricultural value added per worker

GOV: governance score

PSCTs: share of population living in SCTs

PLCs: share of population living in large cities

HL: share of population living in hinterland.

By this regression, we try to capture how strong are the correlations between the rural inclusion from one side and the other variables from the other side. We have seen in section 2.2 that rural inclusion is positively linked to governance. Furthermore, a relationship is observed between RT and rural inclusion, in which the former is a pre-condition, though insufficient, for the latter (IFAD, 2016). In addition, we aim to use the share of population living in hinterland to capture the role of (lack of) infrastructure in rural inclusion. Urban population has been split into two proportions: those living in large cities and those living in SCTs. While both together reflect the demand, splitting them should enable us to see which one has stronger links to rural inclusion. In addition, this splitting brings to the scene the roles of different agglomeration sizes in rural inclusion. Table 3 presents the economic rationale behind this regression.

Table 3. Establishing the links between rural inclusion and a set of variables that are deemed to affect it: economic rationale behind the regression

Economic factors	Agricultural productivity	Governance	Rural-urban spectrum
RT	X positive*		
Governance		X positive*	
Urban demand			Urban & peri-urban population positive*
Agglomeration			Small cities population positive* & big cities population negative*
infrastructure			Hinterland population negative*

* expected sign of correlation
Source: this study

The results are summarized in Table 4 (column: regression 1) and they are consistent with our expectations in terms of the correlation direction (positive or negative). However, some coefficients are statistically insignificant, namely those assumed to capture the role of agglomeration, demand and (lack of) infrastructure. Symptoms of multicollinearity might be behind the insignificance of these parameters since dropping the share of population residing in hinterland (taken to be a proxy of lack of infrastructure), the coefficient of PSCSTs becomes significant (regression 2 in Table 4).

Table 4. A simple relationship between rural inclusion, the share of population in secondary towns, and governance. For a set of 58 countries across the World

Item		**Regression 1**	**Regression 2**
Agriculture Productivity (AGVA)	Coefficient	0.0007	0.0007
	Standard error	0.0003*	0.00038 *
Governance (GOV)	Coefficient	0.33	0.37
	Standard error	0.1989 *	0.1996*
share of population in SCSTs (PSCSTs)	Coefficient	0.11	0.42
	Standard error	0.26	0.16693 **
Share of population in large cities (PLCs)	Coefficient	-0.21	0
	Standard error	0.2	0.15
Share of population in hinterland (PHLs)	Coefficient	-0.39	Dropped
	Standard error	0.25	Dropped
R^2		0.259	0.224

Source: this study

An initial interpretation of the signs of the coefficient in regression 1 can be that agricultural productivity, governance and SCSTs are all positively correlated with rural inclusion. Therefore, although our intention is not to establish causality, the assumption that SCSTs can offer more inclusive paths to development is confirmed. On the other hand, the coefficient of large cities, insignificant in both regressions, indicate that more big cities may positively or negatively be correlated tot rural inclusion.

4. Moving from levels to rates of change: country typologies and policy implications

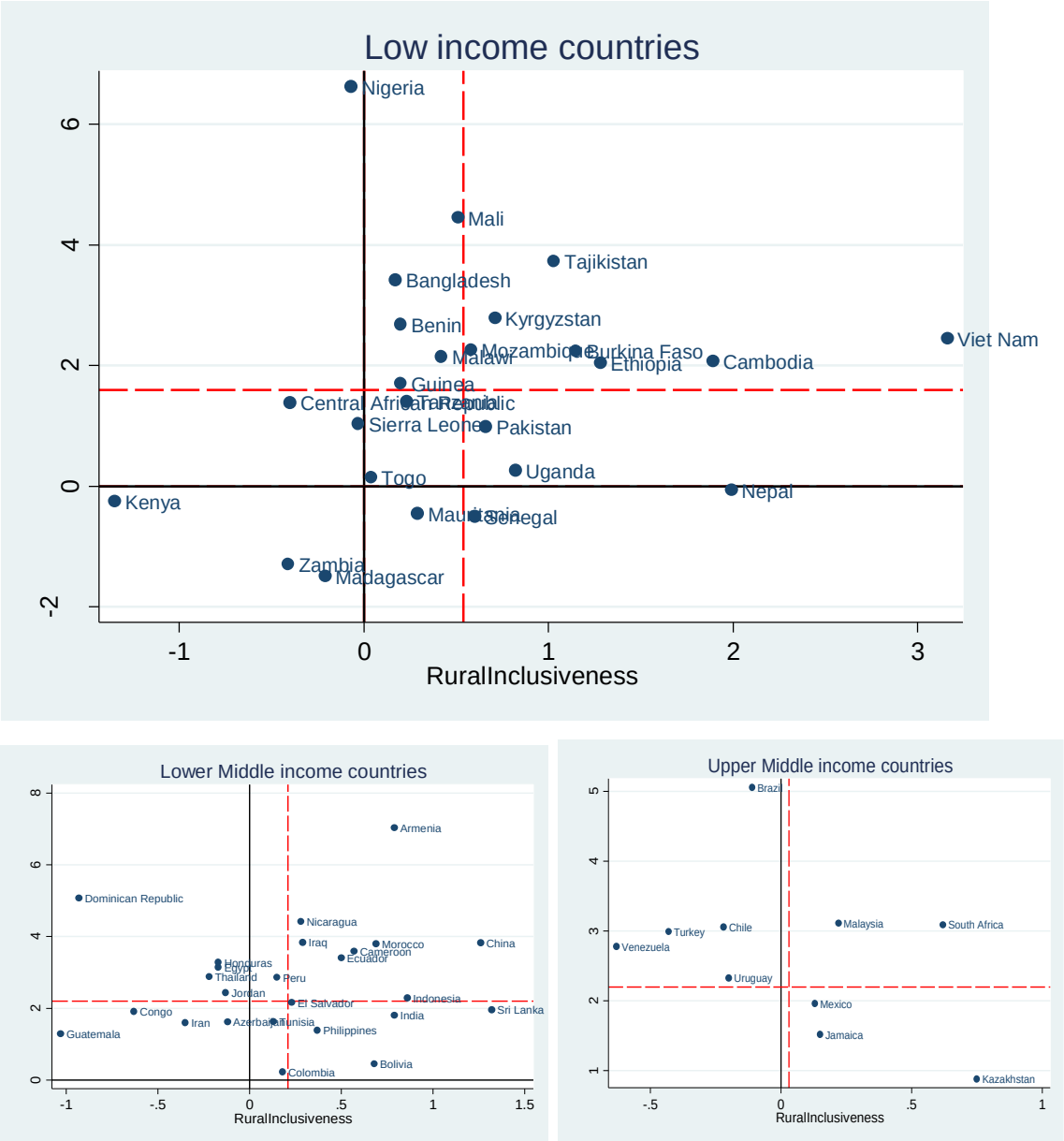
4.1. Patterns of rural transformation and inclusion: country typologies

Patterns of RT and inclusiveness are mostly affected by two elements: their initial levels and their speeds, which together will determine their paths and their final outcomes. But the initial levels of RT, when coupled with resource endowments and allocation, will have implications on the speeds of the RT making the distinction between fast and slow RT processes ambiguous unless the initial level of transformation is accounted for. Consequently, in order to classify countries into fast/slow transformers or/and includers, we should account for their income level.

Figure 8 shows on the x-axis the speed of rural inclusiveness expressed by the annual percentage change of the NPR (refer to section 2.1) against the speed of RT expressed by the annual percentage change in the agricultural value added per worker on the y axis (the axis are the black dotted lines). The averages by income group show that the annual change of RT is lowest in the low income countries (1.59%), but it is noticeably higher for the lower-middle income countries (2.72%), to decrease again, but slightly, in the upper-middle income countries (2.68%). On the other hand, the annual percentage change of NPR goes down constantly from low income (0.54%) to lower middle income (0.21) to upper middle income (0.03). while the differences in the speed of RT can be attributed to the law of marginal returns, the differences in the speed of rural inclusiveness can be explained by the dominance of ST (i.e. growth in industry and services) over RT (growth in agriculture) at higher levels of economic development.

In low income countries, there appears to be a positive relationship between RT and rural inclusiveness. With the exception of 5 countries (Central African Republic, Sierra Leone, Mauritania, Senegal, and Nepal) out of 25, the direction of annual changes for RT and inclusiveness are consistent. This is not the case for middle income countries, where 40-50% of the countries, though having positive speed of RT, their changes in NPR is negative probably because of ST dominance over other factors as mentioned above. In addition, we notice that all countries that have not made positive RT belong to the low income group, re-emphasizing the relevance of the initial level of growth for the direction and the speed of the subsequent development paths.

Figure 8. The speed of RT and rural inclusion for countries by income group



Source: our elaboration from World Bank and IFAD (2016)

One way to classify the countries into fast/slow transformers/includers is through using the averages, represented by the red lines in Figure 8 (the dotted black lines are the axis). Thus countries whose speeds are below (above) the averages are considered slow (fast) transformers/includers. According to the above, countries are classified as follows:

1- Fast transformers & fast includers: These are Cambodia, Viet Nam, China, Malaysia, Burkina Faso, Ethiopia, Mozambique, Cameroon, South Africa, Kyrgyzstan, Tajikistan, Armenia, Iraq, Morocco, Ecuador, and Nicaragua.

2- Fast transformers & slow includers: Bangladesh, Thailand, Benin, Guinea, Malawi, Nigeria, Egypt, Turkey, Dominican Republic, Honduras, Peru, Brazil, Chile, and Venezuela.

3- Slow transformers & fast includes: Nepal, Pakistan, India, Indonesia, Philippines, Sri Lanka, Senegal, Uganda, Kazakhstan, Bolivia, El Salvador, Jamaica, and Mexico.

4- Slow transformers & slow includers: Iran, Kenya, Madagascar, Tanzania, Zambia, Central African Republic, Mauritania, Sierra Leone, Togo and Congo, Azerbaijan, Jordan, Tunisia, Colombia, Guatemala, and Uruguay.

4.2. Implications of speed of RT and rural inclusion for various country typologies

To shed light on whether the low and the negative annual changes in NPR (i.e. those of countries classified as slow includers) are caused by low (or negative) rural inclusiveness of the RT process itself, or by the dominance of an economy-wide ST (i.e. growth in industry and services), we look at the share of *non-poor urban people relative to the national population* (NPU), thus the counterpart of our rural inclusion indicator but calculated for the urban population. The average annual changes of this indicator by income group are 0.36, 0.78 and 0.26 for low, lower-middle, and upper-middle countries respectively. Therefore, the speed of "urban inclusion" is, on average, lower than that of rural inclusion for low income countries and higher for middle income countries (Table 5).

Table 5. Average annual changes in the speed of rural (NPRP) and urban (NPUP) inclusions for a selection of countries by income group

Income group	NPR	NPU
Low income countries	0.54	0.36
Lower-middle income countries	0.21	0.78
Upper-middle income countries	0.03	0.26

Source: authors calculations from World Bank and IFAD (2016)

The changes are self-explained. At early phases of development, RT may be more inclusive than over-all ST that is usually slow and unable to absorb labor released from agriculture. At later stages of development, growth in industry and service sectors expand and generate opportunities by agglomeration economies, causing the ST to dominate the effects of RT, reducing both rural poverty and urban poverty. However, a proportion of the NPU of today could probably have been part of the NPR some time ago due to rural-urban migration caused by more attractive opportunities in the urban centers regardless of the level of RT that has been achieved over the same time span.

At the country level (Table A in the Annex), only five countries out of the 31 classified as *slow rural includers* have the annual change of NPR higher than that of the NPU indicating that ST in most of these countries is proceeding with higher speed and absorbing more labor compared to RT

and thus enabling households to exit poverty, but by moving to urban centers that usually offer more attractive opportunities.

The five countries whose NPU's annual changes were lower than those of NPR are Benin, Guinea, Malawi, Egypt, and Venezuela. The five countries belong to different income groups, but what is common among them is that they are all fast transformers. Having low speed in NPU is an indication of slow and/or non-inclusive ST. Egypt and Venezuela are the only lower and upper middle countries respectively with NPU changes being slower than those of NPR. An additional thing that they have in common is that they exhibit negative changes in both indicators. So in both countries, the shares of poor are increasing, but proportionately more in the urban centers.

Among countries classified as *fast rural includers*, 14 countries out of 29 have the annual change of NPR higher than that of the NPU, from which 9 are low income countries (i.e. low ST). It is noticeable that 10 of these countries are slow rural transformers. Having the speed of NPR for these countries higher than the speed of NPU confirms the inclusiveness of the RT per se. Although the NPU is increasing but at a slower rate than the NPR, which means that more rural people are exiting poverty without migrating to urban centers. The fact that RT is slow for many of these countries could mean that the development process is not closely linked to agriculture.

On the other hand, the other 15 countries whose annual changes in NPR are lower than those of the NPU are all middle income countries except two (Kyrgyzstan and Senegal). We observe an inclusive RT coupled with an inclusive overall ST. Such cases could present the best path for development, where sustained growth in all economic sectors accompanies labor exit from agriculture. In this case, people exit poverty everywhere, and rural-urban migration becomes an option and not an obligation.

5. Concluding remarks

This paper examines how and where RT has been occurring to gain a better understanding of the factors that lead to more inclusive RT. We focused on exploring the role of SCTs in the transformation process. As the paper is still a work in progress, we followed an *ad hoc* manner in describing data and presenting results. The results confirm that agricultural productivity increase is a necessary, though insufficient, pre-condition for rural inclusion. Governance is a central driving force in RT and rural inclusiveness. Data from the RUS highlights the importance of looking at urbanization as continuum ranging from rural hinterland areas to megacities, passing through a wide spectrum of small cities and towns and their surroundings that can be seen as either rural areas in proximity of cities or as peri-urban areas.

In order to capture the combined role of all the identified potential drivers of rural inclusiveness, we developed an analytical framework by regressing a set of variables reflecting these drivers on our measure of rural inclusion. The results show that the signs of the coefficients are as expected

but a substantial improvement still needs to be done to improve the statistical significance of the coefficients.

Analysis from country typologies on the speed of RT and rural inclusiveness shows that no country has witnessed an increase in rural inclusion without an improvement in agricultural productivity. However, more than 17 countries (out of 63) have seen a decline in rural inclusiveness despite having been able to increase agricultural productivity. In this case, it is important to look at other factors in order to understand whether this decline is due to weak rural inclusiveness, or whether it is due to a stronger "urban inclusiveness" driven by growth in industry and services, pulling rural people towards urban centers. One helpful factor is the changes in the NPU and whether it is faster or slower than the changes in NPR. The NPU provides an indication on how inclusive is the overall ST and its consequent urbanization process.

Despite the importance of the interaction between RT and ST in determining levels and speeds of rural inclusiveness, the latter depends on other factors. We have found that, as countries move along their transformation path, there is a positive relationship between rural inclusiveness and SCTs, while the relationship is negative with big cities, confirming that SCTs are more able to provide patterns of growth that generates opportunities more easily accessible by the poor as already found by past studies. In addition, the expansion of many SCTs (rather than the expansion of a few big cities) will spatially distribute opportunities making them close to rural areas, so people can exit poverty without leaving their homelands, exactly in line with our understanding of rural inclusiveness. Governance also has an important role to play in enhancing inclusiveness. Apart from supporting efficiency, data analysis showed that effective rural governance has also a strong and positive link to rural inclusiveness.

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Annex

Table A. Country categories by speed of RT and rural inclusion with country NPRP and NPUP for comparison

Speed of inclusion	Speed of RT	Income group	Country	NPR	NPU	Difference
slow	Fast transformers	L	Bangladesh	0.17	0.18	0.01
		L	Benin	0.2	0.05	-0.15
		L	Guinea	0.2	0.02	-0.18
		L	Malawi	0.42	0.03	-0.39
		L	Mali	0.51	0.73	0.22
		L	Nigeria	-0.07	0.4	0.47
		LM	Dominican Republic	-0.93	1	1.93
		LM	Egypt	-0.17	-0.26	-0.09
		LM	Honduras	-0.17	0.46	0.63
		LM	Peru	0.15	0.79	0.64
		LM	Thailand	-0.22	1.31	1.53
		UM	Brazil	-0.11	1.01	1.12
		UM	Chile	-0.22	0.5	0.72
		UM	Turkey	-0.43	0.93	1.36
		UM	Venezuela	-0.63	-4.95	-4.32
	Slow transformers	L	Central African Republic	-0.4	0.69	1.09
		L	Kenya	-1.35	-0.05	1.3
		L	Madagascar	-0.21	-0.1	0.11
		L	Mauritania	0.29	1.15	0.86
		L	Sierra Leone	-0.03	0.01	0.04
		L	Tanzania	0.23	0.48	0.25
		L	Togo	0.04	0.43	0.39
		L	Zambia	-0.41	-0.31	0.1
		LM	Azerbaijan	-0.12	0.35	0.47
		LM	Colombia	0.18	1.34	1.16
		LM	Congo	-0.63	-0.19	0.44
		LM	Guatemala	-1.03	0.15	1.18
		LM	Iran	-0.35	1.77	2.12

		LM	Jordan	-0.13	0.86	0.99
		LM	Tunisia	0.13	0.68	0.55
		UM	Uruguay	-0.2	0.62	0.82
fast	Fast Transformers	L	Kyrgyzstan	0.71	0.71	0
		L	Mozambique	0.58	0.22	-0.36
		L	Tajikistan	1.03	0.39	-0.64
		L	Viet Nam	3.16	1.15	-2.01
		LM	Armenia	0.79	1.74	0.95
		LM	Cameroon	0.57	1.55	0.98
		LM	China	1.26	1.87	0.61
		LM	Ecuador	0.5	0.94	0.44
		LM	Indonesia	0.86	1.07	0.21
		LM	Iraq	0.29	-0.01	-0.3
		LM	Morocco	0.69	0.81	0.12
		LM	Nicaragua	0.28	1.17	0.89
		UM	Malaysia	0.22	2.04	1.82
		UM	South Africa	0.62	1.17	0.55
	Slow Transformers	L	Burkina Faso	1.15	0.42	-0.73
		L	Cambodia	1.89	0.45	-1.44
		L	Ethiopia	1.28	0.42	-0.86
		L	Nepal	1.99	0.24	-1.75
		L	Pakistan	0.66	0.53	-0.13
		L	Senegal	0.6	0.62	0.02
		L	Uganda	0.82	0.14	-0.68
		LM	Bolivia	0.68	0.82	0.14
		LM	El Salvador	0.23	0.83	0.6
		LM	India	0.79	0.47	-0.32
		LM	Philippines	0.37	-0.11	-0.48
		LM	Sri Lanka	1.32	0.19	-1.13
		UM	Jamaica	0.15	0.37	0.22
		UM	Kazakhstan	0.75	0.35	-0.4
		UM	Mexico	0.13	0.6	0.47