Infrastructure Imbalance, Financial Investment and AIIB's Role: Non-state Actor in Regional Governance

Xiangyi MENG, M.S. in Urban Planning, School of Architecture, Tsinghua University; China

Taofang YU, Associate Professor, School of Architecture, Tsinghua University; China

Abstract

The Asian Infrastructure Investment Bank (AIIB), a new multilateral development bank, is an emerging force to solve the problem of infrastructure imbalance in developing countries in Asia. Only a few existing researches focuses on infrastructure investment and spatial governance. Based on the economic geographical framework of density, distance and division, this paper attempts to analyze three traditional governance modes in the context of infrastructure imbalance in developing countries in Asia: low-density sprawl, long distance and limited accessibility to central markets, and spatial division. Infrastructure has obvious positive externalities and will widen the differential rent gaps through land value increment, which will bring higher economic density and agglomeration economies. After analyzing the AIIB's 38 approved investment projects, this paper takes Colombo urban regeneration project in Sri Lanka, Gujarat rural roads project in India and Mandalika tourism infrastructure project in Indonesia as examples, to explore the AIIB's non-state role in spatial governance.

Keywords

Asian Infrastructure Investment Bank (AIIB); Infrastructure-led Development; Density, Distance and Division (3Ds); Under-developed Areas; Differential Rent.

1. Introduction: Infrastructure Imbalance in Asian Developing Countries

According to relevant theories of public economics, infrastructure is a category of “quasi-public goods” with rivalry and non-excludability. Rivalry of infrastructure will generate positive externalities of land value increment and more private capital. However, its non-excludability makes it difficult for the public sector to avoid the “Tragedy of the Commons” caused by free riders. Features of quasi-public goods result in insufficient incentives for private investors as the private benefit is far less than the overall social benefit from the infrastructure construction (World Bank, 1994; Mankiw, 2012). Meanwhile, infrastructure is characterized by large investment amount, long return period, huge “sunk cost” and high initial risk. Only when a completed network forms can infrastructure fully perform its functions (McCann and Shefer, 2004; Ehlers, 2014). These economic attributes make public

investment a major source of infrastructure financing, for which private capital is not easy to access (World Bank, 1994; Asian Development Bank, 2017).

Developing countries in Asia are suffering from severe infrastructure imbalance and infrastructure investment gap. The rapid economic development and urbanization have given rise to much more demands for urban and regional infrastructure (Straub and Terada-Hagiwara, 2010). Public capital alone cannot meet the increasing needs. However, the private sector and international capital markets are far from being tapped (Ehlers, 2014).

The Asian Development Bank (ADB) estimated that Asia and Pacific Region would need an investment of \$22.551 trillion from 2016 to 2030. In 2015, the infrastructure investments in 25 developing member countries were \$881 billion, but there was still a financing gap of \$459 billion. The public sector overwhelmingly dominates the existing infrastructure investment. It accounts for 92%, much more than any other financing sources, including Multilateral Development Banks (MDBs), an emerging force in infrastructure investment, which only accounts for 2.5% (ADB, 2017). The research conducted by McKinsey Global Institute indicated major needs of approximately \$20.1 trillion in developing countries in Asia from 2016 to 2030 (McKinsey Global Institute, 2016). Meanwhile, another report released by the World Economic Forum evaluated infrastructure capacity worldwide in terms of transportation, electric power and water supply (Figure 1). The report indicated that the infrastructure gap and imbalance was so evident in developing countries in Asia that an effective solution was of great urgency. (Schwab, 2018).

Figure 1 Infrastructure scores of Asian developing countries

Source: Authors' compilation from the Global Competitiveness Report 2018 (Schwab, 2018).

Under such circumstances, the Asian Infrastructure Investment Bank (AIIB), established in January 2016, gradually becomes an emerging force in infrastructure investment. Initiated by China, it aims at bridging the long-existing and huge infrastructure financing gap in developing Asia by further investments, and promoting sustainable economic development. (AIIB, 2015). Unlike the World Bank, the Asian Development Bank and other existing multilateral financial institutions with diversified business domains in multiple countries, the AIIB mainly focuses on Asian developing economies and the investment in sustainable

infrastructure projects, playing a potential critical role in addressing Asian issues. In recent years, researches on the AIIB mainly analyze its development process (Etzioni, 2016) and institutional administration structures (Chin, 2016; Callaghan and Hubbard, 2016), and some are conducted from international political perspective (Hameiri and Jones, 2018; Wilson, 2019). However, there is few researches on the AIIB's infrastructure investment projects and spatial governance. This paper, from the spatial perspective, attempts to provide a theoretical framework to describe the participation of multilateral financial institutions in regional spatial governance.

How to solve the problems of infrastructure imbalance and financing gap in developing countries in Asia? As an emerging force in infrastructure investment, how does the AIIB participate in regional governance as a non-state actor? To answer these questions, the paper, based on the World Bank's framework of "Density, Distance and Division", analyzes the AIIB's approved projects, the traditional governance phenomena in the context of infrastructure imbalance, and the revolution brought by the external capital.

The paper is divided into four parts:

- (1) Background: economic attributes of infrastructure and infrastructure imbalance in Asian developing countries;
- (2) Research materials: basic information and spatial distribution of the AIIB's 38 approved projects;
- (3) Theoretical framework: the economic geographical framework of density, distance and division; traditional spatial governance shaped by the long-standing infrastructure imbalance in developing countries in Asia; and positive externalities of infrastructure through differential rent;
- (4) Case studies: three projects located in Sri Lanka, India and Indonesia, and AIIB's spatial governance effects through infrastructure investment.

2. Research Materials: AIIB's Approved Projects

Selected research materials were mainly the published documents on AIIB's official website (<https://www.aiib.org>), including 112 documents of 38 approved infrastructure investment projects. The research materials cover basic financing information, environmental and social planning frameworks, and the latest implementation progress. Additionally, the research materials also contained the AIIB's establishing agreements, documents concerning banks' management framework, investment policy, business strategies and other basic regulations, relevant news reports and documents of the proposed projects. The basic institutional information, annual reports and project documents of the World bank and Asian Development Bank published on their official websites were also used as extra information during the research. The documents of the AIIB's 38 approved projects were classified according to 10 attributes. They are the project location, types of infrastructure, total project investment amount, investment entities and their investment ratio, co-financing with other multilateral banks, the status of guarantee, attributes of borrowers and implementation agencies, maturity period, project risk levels, and the time of approval and implementation periods.

As for location, the AIIB's 38 approved projects are carried out in 15 developing Asian countries, which embodies AIIB's innovative feature of regional, developing countries dominance. Among them, 9 are in India, 5 in Indonesia and 4 in Bangladesh. The 3 countries have the largest number of approved projects. The remaining 12 countries have one or two respectively. Except for that, two fund projects involving financial intermediaries are not country-specific but serve developing regions in Asia as a whole¹. The AIIB's focus on developing Asia is also reflected in its membership. It reserves 76.6% total subscriptions of contributions for regional member states (AIIB, 2019a), which is higher than that of the Asian development bank (63.4%), a regional multilateral development bank (ADB, 2019).

The AIIB focuses on infrastructure-related financing projects. The 38 approved projects cover Energy (34.2%), Telecommunications (2.6%), Transport (23.7%), Urban (5.3%), Water (13.2%), Finance (13.2%), and multi-sector (5.3%)². The projects mainly focus on trans-regional energy and transport infrastructure, at the meantime, they have more specific and diversified subsectors (Figure 2).

Risk and return is the core concern of private multilateral financial institutions. Relevant attributes include guarantee status, and the attributes of borrowers and implementation agencies. Such factors have an obvious influence on the risk and profit outlook of the AIIB. The guaranteed projects can be further divided into projects with sovereign-backed financing (SBF) and projects with non-sovereign-backed financing (NSBF). SBF means that loans have sovereign guarantee, and others are identified as NSBF (AIIB, 2017a). According to the attributes of borrowers and implementation agencies, projects are further classified into public-sector-led projects and private-sector-led projects in this paper. The public-sector-led projects refers to those whose borrowers and implementation agencies are governmental institutions, state-owned or state-controlled enterprises, and social institutions and organizations established by governments for special purposes. The private-sector-led projects refers to those whose borrowers and implementation agencies include private entities, such as the institution established by a joint-stock company which is jointly owned by diversified stakeholders for special purposes. As an emerging multilateral development bank, the AIIB has 29 projects guaranteed by sovereign credit, 27 of which were led by the public sector of recipient countries. And among the other 9 projects with NSBF, 2 are led by the recipient countries' public sector.³ Sovereign guarantee and the leading role of the public sector will help financial institutions reduce investment risks at the early stage of their establishment, accumulate project investment experience step by step, and pursue long-term returns.

Based on the basic information of these projects, this paper analyzes the traditional governance phenomena in the context of infrastructure imbalance in Asian developing countries and, by studying the following 3 projects, analyzes the modes of the AIIB's participation in spatial governance.

¹ Source: Authors' compilation from documents of the AIIB's approved projects.

² Source: Authors' calculations from documents of the AIIB's approved projects.

³ Source: Authors' compilation from documents of the AIIB's approved projects.

Figure 2 Types of infrastructure in AIIB's approved projects

Source: Authors' compilation and calculations based on documents of the AIIB's approved projects.

3. Theoretical Framework based on Density, Distance and Division

3.1. Literature Review

Review of Literature on 3Ds

Density, Distance and Division (the 3Ds), three elements of economic geography, were regarded as the core of regional economic development in the world development report published by the World Bank in 2009. According to the report, the density of economic, capital and technical elements per unit land can be used for evaluation of local economic outcomes efficiency (World Bank, 2009). Studies have fully proved that high-density agglomeration economies promote continuous economic development and urban economic output efficiency (Wheaton and Shishido, 1981; Ciccone and Hall, 1993; Gallup, Sachs and Mellinger, 1999). The distance from a region to the core market, or the accessibility to the core market, can be used for the evaluation of the region's potential for obtaining spillover effects and integrating into market exchanging system (World Bank, 2009). It is generally acknowledged that the longer the distance from the region to the core market is, the less the spillover effects of capital the region will obtain, and the longer distance is an unfavourable factor for production efficiency, employment opportunities and wages in the region and for agglomeration economies (Rosenthal and Strange, 2001; Roberts and Goh, 2011). Division refers to the geographic and social impermeability and barriers because of borders, languages and regulation systems among regions. It can be used to evaluate the regional economic integration. In Asian developing countries, factors for spatial division exist widely. These factors can be divided into institutional factors and social-cultural factors. The former includes national borders, regional administrative boundaries and regulation systems, while the latter refers to languages, cultural customs, religions, races, etc. (World Bank, 2009; Wang *et al*, 2018).

It is generally acknowledged that higher density of economies, shorter distance to the central market and less division will develop agglomeration economies and improve the overall economic efficiency (World Bank, 2009). A few researches have analyzed under-

developed regions and especially Asian developing economies based on the framework of 3Ds. They have proved that the relation between 3Ds and economic development also applies to developing countries and under-developed regions (Guo and He, 2012; Wang *et al.*, 2018). However, only few studies analyze the traditional governance phenomena, and especially land use features, using the framework of 3Ds.

Review of Literature on Infrastructure and Governance

Infrastructure supply is closely related to regional governance. Infrastructure imbalance is a major reason for regional under-development, while diversified external sources of infrastructure investment can improve the governance structure (Mengistu and Adams, 2007; Ogun, 2010; Sorensen, 2018). In Asian, African and Latin American developing countries, inefficient governance of the public sector and limited capacity of public investment have severely influenced the supply of basic infrastructure, which increasingly attracts global attention. Emerging forces such as non-governmental organizations (NGOs), the private sector and international donors are increasingly participating in the developing economies' improvement of infrastructure and governance. Social infrastructure aid such as governance structure improvement is gradually replacing physical infrastructure aid (Nunan and Satterthwaite, 2001). Compared with the internal forces in developing countries, "non-state" governance can bring institutionally and spatially changes to the recipient countries from the outside in a more profound and direct manner (Mengistu and Adams, 2007). For instance, the World Bank, the Asian Development Bank and other existing multilateral financial institutions have assisted the recipient countries through infrastructure investment projects, as well as assisted their social governance through technical assistance, anti-corruption mechanisms and capacity building (Bafoil and Lin, 2010).

Although there are substantial researches on infrastructure, regional governance and diversified external forces, only few researches analyze traditional governance phenomena in the context of infrastructure imbalance and the role of infrastructure in spatial governance. This paper mainly focuses on the two aspects.

3.2 Analyzation of Traditional Governance Phenomena in Asian Developing Countries based on 3Ds

As mentioned before, the infrastructure imbalance and financial investment gap have long plagued developing countries in Asia. The long-term infrastructure imbalance results in limited endowment of density, distance and division, causing problems of low-density sprawl, long distance and limited accessibility to the central market, and severe spatial division. In this paper, we classify the traditional governance phenomena into three categories: (1) the low-density sprawl existing in urban areas and towns; (2) long distance and limited accessibility to the core market in under-developed areas; (3) the spatial division and collage in the most under-developed urban and rural areas, or unpopulated zones (Table 1).

First, the low-density sprawl exists in urban areas and towns in Asian developing countries. It still functions under contemporary governance discourse systems, with public and private sectors jointly providing management, public services and goods. However, the low saving ratio and low investment ratio of cities' public finance lead to low returns rate of land output. The long-existing inefficient development has led to an undifferentiated network in terms of spatial connection, without spatial centers and nodes. Social diversified capital is of low

liquidity and lack of encouragement for converging, so the effect of agglomeration economies is not obvious. As for the land use, low-density, high-homogenized urban sprawl is the core feature in such regions.

Second, under-developed areas have long distance and limited accessibility to central markets. Studies have fully proved that long-distance and cross-regional infrastructure, such as transportation and communications can effectively shorten the spatial distance, reduce transportation costs and promote liquidity of business capital. On the contrary, remote location and limited accessibility brought by the lack of regional infrastructure will hinder the regions' participation in the regional trading network and decrease spillover effects of central market (Limão and Venables, 2001). Other infrastructure, such as electricity and fossil energy, can also improve the economic density of the region. In under-developed regions in Asia, infrastructure imbalance isolates a large number of remote areas which are far from central markets, and the connections between these regions are often vulnerable and uneasy to establish. Due to the lack of capital elements, land use in remote areas also indicates the primitive features of low economic density.

Third, spatial division and collage are common in the most under-developed urban and rural areas, or unpopulated zones in developing countries in Asia. Diversified institutional and social division factors, such as local tribes, clans, special interest groups, warlord separatists and administrative boundaries, have contributed to an autonomy based on localism. The fragmented regions hinder trans-regional and large-scale infrastructure investment, planning and construction, making it difficult to form a unified capital market within the region. Clans and tribes, which are commonly seen in rural areas of developing countries in Asia, maintain the governance of villages and tribes by blood ties. When facing these aforementioned existing circumstances, planning and construction of regional infrastructure often encounter difficulties such as civilization conflicts, land acquisition problems and resettlement reimbursement. These remaining forces make the regional infrastructure far from reaching the living standards of contemporary people. Special interest groups, such as gangs in urban slums and opposition regimes across Asia, generate a "self-organizing" governance which means being independent from the public governance. Such groups are only responsible for the economic and social affairs within their groups, such as collecting taxes, providing protection services, or providing basic public services like sanitation and electricity. There are strong centripetal forces and cohesion inside these groups, but insufficient spatial connections between groups, which embodies the spatial division and collage. Land is usually fragmented and combined with inefficiency.

Table 1 Analyzation of traditional governance in Asian developing countries based on 3Ds

Traditional Governance	Scope	Governance	Spatial connection	Land use features
Low-density sprawl	Under-developed urban areas and towns	Inefficient contemporary governance: low investment rate and low rate of returns	Undifferentiated network: lack of spatial centers or nodes	Undifferentiated land use and low-density sprawl

Long distance and limited accessibility to the core markets	Remote districts with limited accessibility	Isolated autonomy	Vulnerable and uneasily- established connection	Low density and fragmentation
Spatial division and collage	Most under- developed urban/rural areas, or unpopulated zones	Autonomy by local tribes, clans, special interest groups or within administrative boundaries	Centripetal division and localism	Fragmentation, inefficiency and collage

3.3 Differential Rent under Infrastructure-led Development

According to the theories of economic geography, a higher economic density will bring about increasing return and agglomeration economies, which is the foundation for regional divergence and locational selection (Krugman, 1991). The positive externalities of infrastructure play a significant role in increasing economic density, and sound infrastructure is the foundation for agglomeration economies (McCann and Shefer, 2004). As for the under-developed districts, remote location, limited accessibility to urban agglomeration economies and spatial division are often the main causes of poverty (Partridge and Rickman, 2008). Meanwhile, infrastructure, especially roads and highways, will effectively shorten the distance, improve the connectivity among human settlements and the flow of capital, business and labors among regions (Limão and Venables, 2001). However, agglomeration economies are closely related to the process of widening the gaps in differential rent. Only few researches focus on the relationship between 3Ds, infrastructure and differential rent.

Differential rent, including Differential Rent I and Differential Rent II, refers to differences in land production efficiency because of differences in land capability and location. Differential Rent I refers to land output efficiency differences caused by the differences in soil fertility and location, while the latter refers to land output efficiency differences caused by the differences in investment, technology and new equipment (Marx, 1909). After the construction of infrastructure, although natural features of the land don't change, the improvement on location will attract emerging elements like capital, public amenities, modern technology and high-quality labor force, as well as raise both Differential Rent I & II. In the infrastructure-led urban and rural development, the positive externalities of infrastructure play a significant role in improving economic density, which will lead to spatial spillover and land value increment (McCann and Shefer, 2004). During this process, differences will increase and gaps in differential rent will be widened, which will attract capital with stronger land rent affordability to the central zone of mega-cities, and thus form agglomeration economies.

In developed countries, the function zones in urban and rural areas are clear and development is driven by agglomeration economies (Gottmann, 1957). Unlike them, the typical urban and rural land use in developing countries in Asia is summarized as the

"Desakota" model. Due to high population density, huge demand for production and business activities within limited space, and the international context of integrating into the world market and undertaking industrial transfer from developed economies, economic activities in developing countries in Asia have the characteristics of highly mixed and undifferentiated sprawl from urban center to rural in terms of land use (Ginsburg, Koppel, and McGee, 1991). Infrastructure imbalance in under-developed regions in Asia results in low capital density, long distance to central markets and fragmented area division. The long-standing problem of infrastructure imbalance has such consequences: (1) The lack of infrastructure narrows the gap between actual rent and the absolute rent, which will lead to less encouragement to generate surplus value and widen the gaps in differential rent. (2) It is the natural feature of capital to chase economies of scale so that an undifferentiated land will not be favorable enough to attract gathered capital. Only little capital with weak rent affordability will locate in these areas. (3) Differences in functions and landscapes between city centers and suburban areas, or built-up areas and rural areas are not obvious. And an urban-rural low-density sprawl pattern has formed. (4) In the long term, it is easy for this governance mode to get caught in a "closed vicious circle", that is, lack of investment – imbalance and shortage in infrastructure – undifferentiated differential rent – unattractiveness to capital - lack of investment again.

Infrastructure-led development is relatively more sustainable and can form agglomeration economies. First, infrastructure will become the driving force of improvement in geographical location and land rent value increment. Then, capital with stronger land rent affordability will inflow, which will upgrade the industry, capital density and economic vitality, which is the initial effects of aggregation economies. Third, the capital-intensive districts will expand to surrounding areas, which will optimize overall functional zone division and spatial structure of the city.

4. Case Study: AIIB's role in Regional Governance

Generally, regional governance involving bilateral or multilateral external forces has two modes. The first mode is mainly for the public sector, and often financially backed by sovereign credit. Because of its low risk, such loans generally have a long maturity period and are suitable for large-scale, long-distance infrastructure investment in developing countries. In such projects, the AIIB will not directly participate in the distribution of profits, but only receive a certain proportion of loan interests as the investment revenue after the maturity period. The second mode is mainly for the private sector, often with a non-sovereign back. Because of the limited economic and credit capacity of guarantees, financial institutions tend to pursue short-term profit. In the second mode, financial institutions usually adopt "direct" governance methods such as participating in land development as shareholders, holding shares of the projects and obtaining operating dividends.

At present, the AIIB's 38 approved projects are mainly sovereign-backed financing. The AIIB's indirect spatial and institutional governance, that is, not participating in regional governance as a political, administrative or implementation entity, reflects the AIIB's role of a "non-state" actor. Based on the aforementioned 3Ds framework, this paper analyzes the AIIB's role in regional spatial governance, with cases of Colombo urban regeneration project (increment of economic density), Gujarat rural roads project (improvement in accessibility)

and Mandalika tourism infrastructure projects (spatial integration). All the three projects are sovereign-backed, with standalone financing (without other multilateral development banks as co-financers) and without the AIIB's direct participation in the distribution of profits. Among them, the urban regeneration project is analyzed as the main case, because in this case, economic density and agglomeration economies have the most direct and profound influence on space.

Figure 3 Locations of selected projects

Source: Base maps are from the Google Earth. The projects' locations are from the AIIB's investment documents (AIIB, 2017b; AIIB, 2018; AIIB, 2019b).

4.1. Density: Colombo Urban Regeneration Project in Sri Lanka

Colombo urban regeneration project is a typical example of dealing with low-density sprawl within urban built-up areas through widen of differential rent by infrastructure investment. Colombo is the largest mega-city with the highest economic and population density in Sri Lanka. However, like the most cities in under-developed regions in Asia, the land use of Colombo is characterized with obvious low-density sprawl. In 1960s, the Government of Sri Lanka built one-or-two-stories buildings with low density to handle the housing problems of low-income people (AIIB,2019b). Most of them have suffered long from the severe deficiency in electricity, drainage system, road access, etc. According to a survey of Urban Development Authority, there are still 68,812 households, over 50% of Colombo's population, living in 1499 such underserved communities in Colombo (Urban Development Authority, 2018a). In terms of land use, commercial land is now concentrated in the north-south narrow regions near the west coast. Low-story communities have taken up vast tracts of urban land, resulting in the low-efficient, low-density land use. Limited unused land hinder the expansion of urban commercial district, which seriously affects the accumulation of capital and the promotion of economic density. Additionally, the newly built-up areas have to turn to the suburbs which are farther from the city center (Urban Development Authority, 2018b; AIIB, 2019b). In consequence, the phenomenon of cities and towns encroaching into peripheral villages and woodlands became increasingly severe.

In the background of low-density sprawl, AIIB supports the Government of Sri Lanka through standalone infrastructure investment to carry out urban regeneration, aiming at regenerating the underserved low-income communities by demolition, and land redevelopment in Colombo, Sri Lanka, to provide affordable housings for the bottom class and improve land economic density, utilization efficiency and potential profits by infrastructure construction and commerce redevelopment. According to the financing documents, this AIIB-led project has two major tasks. One is to build 4074 affordable multi-story apartment units, which will be carried out in 6 blocks with 17.4 acres of land in total, to meet the residential needs of low-income groups. The other one is to redevelop the 92 acres of vacated land in 10 blocks (Figure 4). 6 acres of land will be used for basic infrastructure and the rest 86 acres of land for commercial redevelopment. Small pieces of land will be directly auctioned to developers. Medium-sized land will be auctioned after being subdivided and equipped with infrastructure by implementation agency. Public-Private-Partnership (PPP) will be applied to large-sized land, replacing implementation agencies with elected private partners for land redevelopment (AIIB, 2019b).

Figure 4 Locations of land for affordable housings and redevelopment in Colombo

Source: Base map and street view pictures are from the Google Map and statistics are from the AIIB's financing document of the project (AIIB, 2019b).

Urban regeneration and land transaction involves multiple stakeholders with diversified demands. Firstly, the public sector represented by states and state-owned institutions, as land owners and implementation agencies of the regeneration, will enjoy the long-term economic benefits brought by land value increment. It is estimated that per unit land price

will increase 6%-166% after land redevelopment (AIIB,2019b; see graphs of land value increment in Figure 4). The infrastructure investment will increase the differential rent of regenerated land, and attract more private capital investment as a financial leverage. After that economic and capital density will increase and agglomeration economies will be formed. Meanwhile, the homogenized urban network will develop new economic centers and nodes during the land redevelopment, and the urban spatial structure will be optimized (Figure 5). Current spatial pattern of high concentration of commercial capital in coastal areas will be gradually replaced by the multiple-center pattern in megacities. Spillover effects of new commercial centers will also promote the upgrading of surrounding areas, and hinder the expansion of built-up areas to rural areas. Additionally, highly-intensive commercial redevelopment will provide funds for future regeneration.

Figure 5 The AIIB's role: from low-density sprawl, and the undifferentiated urban network to the network with new economic centers and nodes

For low-income residents, housing conditions from original “underserved communities” to current affordable housings with adequate infrastructure have substantially improved their living conditions. However, it may also bring about gentrification, with the increase of living costs and “crowding-out” effect for low-income groups. The involuntary relocation may also result in negative, irreversible social impact on individual social networks and cultural memories of low-income residents.

As private partners, developers and contractors will replace governmental agencies to carry out land subdivision, planning and infrastructure construction. The revenue will be distributed between public and private sectors based on the share of contributions (AIIB, 2019b). Maximum profit, which is the core concern of private enterprises, will encourage developers to make a balance between benefits and risks, and fully realize the land's profit potential during commercial redevelopment.

Finally, as the financial provider from outside, the AIIB's financial investment will assist the under-developed regions to jump out of the vicious circle of “low investment, low profit and low efficiency”, and move towards an infrastructure-led development path. Meanwhile, the AIIB is subtly pushing the recipients to form a modern governance mode, through mature multilateral project management. The origin intention is to avoid and mitigate risk of investment that widely exists in Asian developing economies, such as inefficient implementation and damage to environmental and social sustainability. The Colombo urban

regeneration project is run by a specially-established department with modern management structure. Monitoring of implementation by the AIIB will run through the process of planning, financial supply, procurement and construction. The AIIB will provide necessary technical assistance. In each project, the AIIB evaluates the transparency of governmental agencies, environmental and social sustainability, and potential revenue. The Colombo project is rated as "Highly Risky", especially in the aspects of governmental credit, and land acquisition and resettlement (AIIB, 2019b). It will urge the local public sector to pay attention to the anti-corruption, and improve the environmental and social inclusion by respecting the interests of low-income groups. By these aforementioned mechanisms, the local governance will get gradually improved.

In conclusion, the AIIB's role in spatial governance is to promote multiple stakeholders to take part in urban regeneration, promote value increment of specific land, gather capital elements, and gradually change the traditional development mode of low-density sprawl. As shown in Figure 6, the graph reflects the traditional mode of low-density sprawl before land redevelopment in Colombo: the central business district of Colombo has strong land rent affordability, while areas outside the central business district are characterized with undifferentiated low-density sprawl. The differential rent is very close to the absolute rent. As shown in the Figure 7, after the infrastructure construction and land redevelopment, the land rent curve moves upward and the differential rent increases. The increased differential rent will be shared as profit among the public sector, local residences, developers and the AIIB. The public sector will get profit from land premium. Local residences will enjoy the improved housing conditions. Developers will get economic returns under interests' incentives. The AIIB will acquire a certain rate of interests after the maturity period, although it will not directly participate in the project implementation and distribution of profits, which indicates AIIB's non-state role in regional governance. Additionally, governance structure in under-developed areas will get improved gradually with the introduction of the AIIB's "outside-in" multilateral governance and the guidance of modern management mechanism.

Figure 6 Low-density sprawl before land redevelopment in Colombo

Figure 7 A new infrastructure-led development mode after land redevelopment

4.2. Distance: Gujarat Rural Roads Project in India

It is necessary to construct cross-regional infrastructure because of the demands for regional social-economic connections such as transportation and telecommunications, as well as the uneven distribution of fossil energy, electricity and other resources. In the AIIB's 38 approved projects, regional infrastructure projects aiming at shortening the spatial distances among districts, including construction of inter-city highways, urban rail transits, power transmission, natural gas pipelines, and upgradation of rural roads, account for approximately 45%, which shows that the AIIB mainly focuses on shortening spatial distances, improving the free flow of population, capital and commodities, and promoting the even distribution of energy and resources.

The Gujarat rural roads project is sovereign guaranteed by government of India and invested by the AIIB alone. Gujarat, located on the western coast of India, is a relatively developed region of the country, but 57% of its population still live in rural areas (Government of Gujarat, 2017). The project has two tasks. One is the reconstruction of 5045 km unhardened and non-planned roads, and the upgrading of 2518 km hardened roads that have not been maintained for years. And the other one is to upgrade and maintain those planned roads regularly in the following years (AIIB, 2017b). It is estimated that the project will change 8 million rural people's travelling conditions and way of life (AIIB, 2017b).

India has preliminarily established a road system consisting of "national highway", "state highway", "district road", "village road" and "non-planned road" (AIIB, 2017b). However, there are still many remote villages that are far from main roads and lack road branches, and first and second connectivity rural roads which are linked to the national, provincial and district road networks. There are still long distances from villages to central markets, villages and better service facilities. The remote villages are isolated and autonomous. Land is mainly used for agricultural production and housing (AIIB, 2017b). The gap between differential rent and absolute rent is not obvious. The production activities and the way of life in such villages

are in a primitive, self-sufficient and inefficient manner. Moreover, spatial divisions caused by languages, customs and races are quite common. There are still large proportions of scheduled castes (6.74%) and scheduled tribes (14.74%), and some primitive tribal groups still suffer from pre-agricultural living conditions. These tribes mainly use dialects, with a literacy level of less than 50%. In terms of social customs, they have inherited the worship of deities, arranged marriage within communities, and unique customs and festivals (Government of Gujarat, 2017). Localism forces represented by tribes and clans have the feature of introversion because of the lack of transportation infrastructure and the connection to modern societies.

Distance to central markets is the core element that influences rural economic development. Because of the AIIB's investment in transportation, the spatial distance between rural settlements and central markets will be shortened. Influences on spatial governance brought by the investment can be shown in the following three aspects. First, a closer economic connection with higher-grade service points will take shape. Remote villages will be interconnected with higher-level settlements and regional central markets, and will be influenced by the spillover effects of their economic and capital elements, which will increase rural economic density. Agricultural products and agri-processed products will require less transportation time and economic costs, and have the opportunities to be sold with more profits. The service scope of schools, hospitals and other serving institutions located at higher-grade service points will be expanded, which can improve the medical services, and diversify commodity markets in remote rural areas. Second, the formation of linear corridors will be accelerated and in nearby areas, the land price and economic density will increase. Meanwhile, as the population increases, villages will expand alongside roads. Third, the transportation infrastructure will connect the isolated villages and tribes to modern societies and realize spatial de-division.

4.3. Division: Mandalika Tourism Infrastructure Project in Indonesia

Mandalika tourism infrastructure project in Indonesia is a typical infrastructure-led case in the most under-developed rural areas or unpopulated zones. Mandalika, located in Island of Lombok, is one of the Indonesian most economically backward provinces. The project is mainly located in a less-developed rural area with severe poverty. There are 77 villages scattered in the region, with nearly 10000 agricultural households and more than 30000 rural people. Among them, approximately half of the households are struggling in the "lowest to five welfare categories" living conditions. And the population below the poverty line in the region accounts for about 16%. (AIIB, 2018; ITDC, 2018) Indigenous people in Mandalika are mainly Sasak. Current land use has primitive and pre-industrial features, with vast unoccupied dry land, farm land and forest land. Meanwhile, transport infrastructure in the region is insufficient. 72% roads are unpaved earthen roads, which severely influences the economic connections between villages and external markets, resulting in universal spatial division (ITDC, 2018).

The project aims at providing the most basic infrastructure including roads, water supply, drainage systems and electricity, which are now in an extreme shortage. Public investment in infrastructure will lead to the upgrading of regional environment, attracting private investment in tourism industry such as hotel and retail business. After the improvement of tourist facilities, the region will attract an increasing number of tourists, their average stay and consumption, which will increase public and individual income with a unprecedented

speed. Moreover, the project will bring about more than 30000 direct jobs in hotel business and 60000 indirect jobs in relative industries, which will effectively improve the household living standards (AIIB, 2018).

The AIIB introduces Special Economic Zones (SEZ) like Mandalika to realize its spatial governance in under-developed rural areas and unpopulated areas. By doing so, transportation and telecommunication infrastructure are getting significantly improved, which can effectively reduce spatial division. Governance in these under-developed regions has a distinctive pre-industrial feature. Due to the localism forces like clans and tribes and limited accessibility, settlements are quite scattered and inward, showing the land-use pattern of spatial isolation and division (Figure 8).

Due to the lack of endogenous economic driving forces such as technologies, capital and high quality labors, and the limited public financial capacity, the region has been trapped into a "closed-loop" development with low investment rate, low savings rate and low rate of return. The only way to break this "closed-loop" is to establish "Special Economic Zones" with the help of top-down external forces, which will help form a "central zone" with high agglomeration of capital and economic activities. The central zone's spillover effects will further promote the development of its surrounding areas.

During this process, economic density of per unit land will increase, and the former phenomenon of spatial division and collage will be gradually replaced by the centralization brought by "Special Economic Zones". Governance achievements and the return in the public sector will be realized. Driven by the infrastructure investment, the private companies engaged in business and accommodation will join the tourism market and make profits. The indigenous people will have more job opportunities in tourist industry, and thus will get higher family income, and will gradually get rid of poverty through self-employment or being employed in the private sector. In conclusion, in Asian under-developed rural areas of the pre-industrial level or unpopulated zones, the AIIB's infrastructure investment will promote the development of regional economic centers and reduce the spatial division caused by ethnic, tribal and cultural customs.

Figure 8 The AIIB's role: from spatial division to agglomeration economics by the SEZ

5. Conclusion

The paper mainly focuses on the framework of density, distance and division of economic geography, traditional governance modes in the context of infrastructure imbalance in developing countries in Asia, and spatial governance brought about by the AIIB's financial investment. The developing countries in Asia have suffered from severe infrastructure imbalance and a severe shortage of investment. This problem has gradually drawn attention from the academia and society. The traditional public-sector-lead mode is not sustainable. The Asian Infrastructure Investment Bank is gradually becoming the emerging force participating in infrastructure investment in developing countries in Asia.

The framework of density, distance and division is appropriate for analyzing the traditional governance modes in developing countries in Asia. Based on the AIIB's 38 infrastructure investment projects, this paper attempts to analyze traditional governance modes and the AIIB's role in non-state governance under this framework. With current infrastructure imbalance, urban and rural development in developing countries in Asia is characterized by low-density sprawl, long distance and limited accessibility to central markets, and spatial division. The AIIB's participation in regional governance is realized through spatial and institutional governance. As for its spatial governance, the AIIB's infrastructure investment will increase land economic density, shorten distance to central markets and achieve spatial de-division. As for its institutional governance, the AIIB will introduce financing supply policies under the supervision of multilateral stakeholders, modern management and behavior constraint mechanism from the outside, which will assist developing countries jump out of the "closed-loop" and gradually optimize their state governance.

In the Colombo urban regeneration project, the differential rent gaps among regions are widened because of land redevelopment, which will lead to an increase in capital density and form agglomeration economies. In the Gujarat rural roads project, distance from remote villages to central markets are evidently shortened, which will decrease the transportation costs and increase the agricultural output. Meanwhile, spatial division because of tribes and remoteness will get mitigated. Indonesia Mandalika tourism infrastructure projects will mitigate the phenomenon of spatial division caused by races, poverty and cultural customs through building a centralized "Special Economic Zone" in the under-developed area.

As aforementioned, the AIIB's role in regional governance could be reflected in spatial and institutional aspects. However, in most approved sovereign-backed projects till now, the AIIB will not directly participate in the distribution of profits. It will only receive a certain proportion of loan interests after the maturity period as an external financial institution. The AIIB's indirect role, that is, not working as a political, administrative or implementation entity which directly participates in spatial governance, institutional governance and distribution of profits, reflects the bank's role as a "non-state" actor in regional governance.

However, there are still several unanswered questions. For example, can such outside governance mode reflect international political and economic games? Can projects in Asian developing countries and the introduction of such governance system reflect the value judgement and ideology of external member states? Does the integration of remote villages into modern governance system potentially threaten the authenticity of cultures? They involve the value judgement and choices of different stakeholders. It takes time to fully

answer these questions. We need to continuously focus on and further study the projects' implementation and the AIIB's future development.

6. Acknowledgements

We would like to express our sincere gratitude to Assistant Professor Amit Chatterjee from Department of Urban and Regional Planning, School of Planning and Architecture, Bhopal, India. Professor Amit Chatterjee provided precious suggestions for the paper's preliminary version, through ISOCARP's "Mentor and Mentee" program. Thanks for his academic advice and encouragement during the mentoring process.

7. References

- Asian Development Bank (2017) Meeting Asia's Infrastructure Needs. Mandaluyong City, Philippines: Asian Development Bank.
- Asian Development Bank (2019) Asian Development Bank 2018 Annual Report, [online] Available at: <https://www.adb.org/sites/default/files/institutional-document/496016/adb-annual-report-2018.pdf>.
- Asian Infrastructure Investment Bank (2015) Articles of Agreement, [online] Available at: https://www.aiib.org/en/about-aiib/basic-documents/_download/articles-of-agreement/basic_document_english-bank_articles_of_agreement.pdf.
- Asian Infrastructure Investment Bank (2017a) Operational Policy on Financing, [online] Available at: https://www.aiib.org/en/policies-strategies/_download/operation-policy/policy_operational_financing_new.pdf.
- Asian Infrastructure Investment Bank (2017b) Project Document: Republic of India Gujarat Rural Roads (MMGSY) Project, [online] Available at: https://www.aiib.org/en/projects/approved/2017/_download/India/document/MMGSY_Project_document.pdf.
- Asian Infrastructure Investment Bank (2018) Project Document: The Republic of Indonesia Mandalika Urban and Tourism Infrastructure Project, [online] Available at: https://www.aiib.org/en/projects/approved/2018/_download/indonesia-mandalika/mandalika-project.pdf.
- Asian Infrastructure Investment Bank (2019a) Members and Prospective Members of the Bank, [online] Available at: <https://www.aiib.org/en/about-aiib/governance/members-of-bank/index.html>.
- Asian Infrastructure Investment Bank (2019b) Project Document: The Democratic Socialist Republic of Sri Lanka Support to Colombo Urban Regeneration Project, [online] Available at: https://www.aiib.org/en/projects/approved/2019/_download/sri_lanka/pd-colombo-urban-regen.pdf.
- Bafoil, François; Lin, Ruiwen (2010) "Re-examining the Role of Transport Infrastructure in Trade, Regional Growth and Governance: Comparing the Greater Mekong Subregion

-
- (GMS) and Central Eastern Europe (CEE)", *Journal of Current Southeast Asian Affairs*, Vol. 29 No. 2 (June).
- Callaghan, Mike; Hubbard, Paul (2016) "The Asian Infrastructure Investment Bank: Multilateralism on the Silk Road", *China Economic Journal*, Vol. 9 No. 2 (April).
- Chin, Gregory T (2016) "Asian Infrastructure Investment Bank: governance innovation and prospects", *Global Governance*, Vol. 22 No. 1 (January).
- Ciccone, Antonio; Hall, Robert E. (1993) "Productivity and the Density of Economic Activity", the National Bureau of Economic Research Working Paper, No. 4313 (April).
- Ehlers, Torsten (2014) "Understanding the Challenges for Infrastructure Finance", BIS Working Paper, No. 454 (August).
- Etzioni, Amitai (2016) "The Asian Infrastructure Investment Bank: A Case Study of Multifaceted Containment", *Asian Perspective*, Vol. 40 No. 2 (April).
- Gallup, John Luke; Sachs, Jeffrey D.; Mellinger, Andrew D. (1999) "Geography and Economic Development", *International Regional Science Review*, Vol. 22 No. 2 (August).
- Ginsburg, Norton; Koppel, Bruce; McGee, T. G. (1991) *The Extended Metropolis: Settlement Transition in Asia, Hawaii, the United States*: University of Hawaii Press.
- Gottmann, Jean (1957) "Megalopolis or the Urbanization of the Northeastern Seaboard", *Economic Geography*, Vol. 33 No. 3 (July).
- Government of Gujarat (2017) *Environmental and Social Impact Assessment (ESIA) for Gujarat Rural Roads (MMGSY) Project*, [online] Available at: https://www.aiib.org/en/projects/approved/2017/_download/India/environmental-social-impact-assessment.pdf.
- Guo, Qi; He, Can-fei (2012) "Density, Distance, Division, and Urban Labor Productivity: Empirical Study Based on Panel Data of 277 Chinese Cities During 2004 - 2009", *Growth and Change*, No. 11 (November).
- Hameiri, Shahar; Jones, Lee (2018) "China challenges global governance? Chinese international development finance and the AIIB", *International Affairs*, Vol. 94 No. 3 (May).
- Indonesia Tourism Development Corporation (ITDC) (2018) *Environmental and Social Impact Assessment (ESIA)/Environmental and Social Management Plan (ESMP) of The Mandalika Urban and Tourism Infrastructure Project*, [online] Available at: https://www.aiib.org/en/projects/approved/2018/_download/indonesia-mandalika/Environmental-and-Social-Impact_plan.pdf.
- Krugman, Paul (1991) "Increasing Returns and Economic Geography", *Journal of Political Economy*, Vol. 99 No. 3 (June).
- Limão, Nuno; Venables, Anthony J. (2001) "Infrastructure, Geographical Disadvantage, Transport Costs, and Trade", *The World Bank Economic Review*, Vol. 15 No. 3 (October).
- Mankiw, N. Gregory (2012) *Principles of Economics*, Beijing, China: Peking University Press.

-
- Marx, Karl (1909) Capital Volume 3: The Process of Capitalist Production as a whole, Chicago, the United States: Charles H. Kerr & Company.
- McCann, Philip; Shefer, Daniel (2004) "Location, agglomeration and infrastructure", Papers in Regional Science, Vol. 83 No. 1 (January).
- McKinsey Global Institute (2016) Bridging Global Infrastructure Gaps, [online] McKinsey Global Institute. Available at: <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/bridging-global-infrastructure-gaps>.
- Mengistu, Berhanu; Adams, Samuel (2007) "Foreign Direct Investment, Governance and Economic Development in Developing Countries", The Journal of Social, Political, and Economic Studies, Vol. 32, No. 2 (Summer).
- Nunan, Fiona; Satterthwaite, David (2001) "The Influence of Governance on the Provision of Urban Environmental Infrastructure and Services for Low-income Groups", International Planning Studies, Vol. 6 No. 4 (November).
- Ogun, T.P. (2010) "Infrastructure and Poverty Reduction: Implications for Urban Development in Nigeria", Urban Forum, Vol. 21 No. 3 (August).
- Partridge, Mark D.; Rickman, Dan S. (2008) "Distance from Urban Agglomeration Economics and Rural Poverty", Journal of Regional Science, Vol. 48 No. 2 (May).
- Roberts, Mark; Goh, Chor-ching (2011) "Density, distance and division: the case of Chongqing municipality, China", Cambridge Journal of Regions, Economy and Society, Vol. 4 No. 2 (July).
- Rosenthal, Stuart S.; Strange, William C. (2001) "The Determinants of Agglomeration", Journal of Urban Economics, Vol. 50 No. 2 (September).
- Schwab, Klaus (2018) The Global Competitiveness Report 2018, Geneva, Switzerland: World Economic Forum.
- Sorensen, André (2018) "Institutions and Urban Space: Land, Infrastructure, and Governance in the Production of Urban Property", Planning Theory & Practice, Vol. 19 No. 1 (January).
- Straub, Stéphane; Terada-Hagiwara, Akiko (2010) "Infrastructure and Growth in Developing Asia", ADB Economics Working Paper Series, No. 231 (November).
- Urban Development Authority (2018a) Introduction of Urban Regeneration Programme, [online] Available at: <https://www.uda.gov.lk/urban-regeneration-programme.html>.
- Urban Development Authority (2018b) Environmental and Social Management Planning Framework, Urban Regeneration Program, Sri Lanka, [online] Available at: https://www.aiib.org/en/projects/approved/2019/_download/sri_lanka/LKA-URP-ESMF_DRAFT_English.pdf.
- Wang, Yongming; Wu, Dianting; Wang, Meixia; Zhou, Li; Ding, Jianjun (2018) "Density, Distance, and Division: Rural Poverty in a Developing-Country Context", Growth and Change, Vol. 49 No. 3 (September).

Wheaton, William C.; Shishido, Hisanobu (1981) "Urban Concentration, Agglomeration Economies, and the Level of Economic Development", *Economic Development and Cultural Change*, Vol. 30 No. 1 (October).

Wilson, Jeffrey D (2019) "The evolution of China's Asian Infrastructure Investment Bank: from a revisionist to status-seeking agenda", *International Relations of the Asia-Pacific*, Vol. 19 No. 1 (January).

World Bank (1994) *World Development Report 1994: Infrastructure for Development*, New York: Oxford University Press.

World Bank (2009) *World Development Report 2009: Reshaping Economic Geography*, [online] Available at: <https://openknowledge.worldbank.org/handle/10986/5991>.