

Infrastructure Investment as a Tool for Poverty Reduction in Rwanda. A Case Study Of Loda (2008-2012/2013)

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ABSTRACT

The study set out the investigation of efficiency and effectiveness of infrastructure investment as a tool for poverty reduction in Rwanda “case study of LODA 2008-2012/2013”. Infrastructure investment and consumption of infrastructure services have significant implications for achievement sustainable development, therefore development of infrastructure improves the supply side of economy by reducing cost, enhances business climate, makes room for better access to market opportunities and opens up new opportunities. Demand side effects of infrastructural investments occur when projects are implemented. In this case, the new project, say road construction, energy, water sanitation, Markets... create new jobs through which incomes are generated. The social dimension of better infrastructure is that it increases access to basic social services, thus improving the living conditions of the poor, and lack of infrastructure in many developing countries represents one of the most significant limitations to economic growth and achievement of the Millennium Development Goals (MDGs). As methodology of this dissertation, on perspective objectives of evaluating the way infrastructure investments eradicate poverty and infrastructure projects accessibility and their benefits to local communities in Rwanda through LODA; Comparative research by using interviews and survey as tools of accessing the second and primary data were applied. Researcher adopted a Cluster sampling in order to get the sample representing the whole population from LODA and all thirty districts funded by LODA. To overcome desired objectives of the study a Questionnaire was used and 79 respondents got each a structured questionnaire but 78 Questionnaires turned back. A quantitative element like tables, graphs was used based on reports published from CDF, RLDSF and LODA for giving more meaning to data analysis and interpretation. The findings showed the positive returns and very significant relationship between Infrastructure investment and Poverty reduction.

Keywords: Infrastructure, investment, Poverty and poverty reduction.

I. INTRODUCTION

Reliable and efficient infrastructure in Rwanda and moreover the world is crucial to economic and social development that promotes pro-poor growth. By raising labour productivity and lowering production and transaction costs, economic infrastructure, transport, energy, information and communication technology, and drinking water, sanitation and irrigation enhances economic activity and so contributes to growth, which is essential for poverty reduction. It is now well recognized and widely understood among practioners and policy

makers; that infrastructure matters to growth. Infrastructure investment needs to support growth varies across different sectors of infrastructure. And there is a positive relationship between Infrastructure investment and poverty reduction [1]. Estache, Foster and Wodon explore the connections between infrastructure reforms (especially private sector participation) and poverty alleviation in Latin America. The authors conclude that service expansion made possible through privatization would lead to poverty reduction if such infrastructural developments were affordable to the poor [2].

The relevance of infrastructure investments to growth and poverty alleviation in Rwanda is empirically robust. LODA has a mandate of fighting against poverty eradication, decided on the condition of basic social services, social safety nets, physical infrastructure, agrarian reforms, improved market access and provision of credit and measures to make sure the sustainability of natural resources and the environment. [3]

Not surprisingly, the infrastructure needs of the poor, the majority of who reside in rural and peri-urban areas have not been met. Recently the issue of poverty reduction has been at the centre of global policymaking. The drive to eradicate extreme poverty in developing countries has become more urgent, given the need to attain the United Nations Millennium Development Goals (UN MDGs) by 2015[4]. Poverty is a multidimensional concept involving the lack of social and cultural, as well as economic, means necessary to procure a minimum level of nutrition, to participate in the everyday life of society, and to ensure economic and social reproduction [5]. Though a substantial proportion of the world's poor occupy rural areas, available evidence indicates that the proportion of the poor in urban areas has been increasing at a rapid rate due to urbanization [6].

Poverty eradication requires economic growth which, when accompanied by sound macroeconomic management and good governance, results in sustainable and socially inclusive development [7]. Suitable to the relationship involving economic infrastructure and economic growth appears to dash in both directions and the need for investment in economic infrastructure certainly not goes away. Better access of the deprived to education and health services, water and sanitation, employment, credit, and markets for produce is needed.

Rwanda has prioritized increased investment both in maintenance and in new infrastructure, because they are vital ingredient for private sector development. Viewed operationally, infrastructure helps the production of goods and services, and also the distribution of finished or semi-finished products to markets, as well as basic social services such as schools and hospitals; for instance the case of Rwanda: transport infrastructure, energy ,water and sanitation, education, health infrastructure, market oriented infrastructure projects, agriculture and livestock. [8]

II. OBJECTIVES

The main objective of this study was to evaluate the way infrastructure investments eradicate the poverty, enhance accessibility and benefits the local communities in Rwanda and the specific objectives are: to assess the impact of infrastructure investments accessible to communities particularly in expanding services and poverty

alleviation; to identify the role of maintenance and sustainability in preserving the value of infrastructure assets and to evaluate infrastructure investments management in achieving sustainable outcomes.

III. RELATED CASE STUDIES

To provide more insights into the link between infrastructure and poverty reduction, Fan and Chan-Kang further examine the impact of public infrastructure on growth and poverty reduction in China. In the study, particular attention is paid to the contribution of roads. This research indicates that low quality (mostly rural) roads have benefit-cost ratios for GDP that are about four times larger than the benefit-cost ratios for high quality roads. The study suggests that in terms of poverty reduction, low quality roads raise far more rural and urban poor above the poverty line per yuan invested than do high quality roads [9].

Jerome and Ariyo (2004) investigate the impact of infrastructural reforms (that is, implementation of privatization and liberalization in telecommunications and private investment in infrastructure) on poverty alleviation. The consequence of this is that infrastructure privatization, rather than having a positive impact, has negatively affected the poor in Africa. The authors argue that the goals of infrastructure reforms can only be achieved if such reforms are undertaken in the context of appropriate market and regulatory frameworks [10].

Morgan J.P., argues that Infrastructure is the keystone of the modern economy. Economic infrastructure assets permit transportation and circulation of goods and essential commodities, such as water and energy, as well as people and information; social infrastructure assets provide structures, like hospitals, for services society needs. [11]

One of the earlier attempts to investigate the role of infrastructure in development processes is Aschauer (1989). In this seminal work based on research done in the United States, the author argues that non-military public investment is far more important in increasing aggregate productivity than military spending. This study concludes that core infrastructure such as street lights, highways, airports, etc. contributes more to productivity than other forms of infrastructure [12].

Following Aschauer's work, several studies have been carried out to unravel the link between infrastructure and poverty. Following this line of research, Fan, Hazell and Thorat (1999) estimate the effect of public expenditure on levels of rural poverty across the country. In this study the authors distinguish between expenditure on rural education, targeted rural development, public health, irrigation, power generation, agricultural research and development (R&D) and rural roads. They find that agricultural research and development, rural roads, rural education and embattled rural development all have negative and statistically significant effects on rural poverty. Of these, spending on agricultural R&D and rural roads has by far the largest impact on both growth and poverty [13].

IV. METHODOLOGY OF THE STUDY

The purposive technique was used by the researcher to choose LODA as a case study. This is because Local Administrative entities Development Agency (LODA) is experienced in the financing the different types of

infrastructure in all districts of Rwanda. It is on this basis that, the researcher used primary and secondary data, which was collected and further processed to have an understanding of infrastructure investment as a tool for poverty reduction in Rwanda. A cluster sampling was selected on the basis of what the researcher thought that particular sample unit could contribute to answer the particular research questions. Due to the area of intervention, time and financial status, the study covered few LODA staff and selected two staffs per district who deal with investments infrastructure which are Director of planning and District infrastructure officer. The researcher selected 79 respondents from LODA and District staff. In this case 19 LODA staff was interviewed as well as 60 district staffs. The data processing was done through editing and tabulation [14].

V. FINDINGS OF THE STUDY

This study presents the results of the data analysis and gives an overview of the general findings made during this period of research. The data were collected and processed in response to the research questions. Three fundamental objectives drove the collection of the data and the subsequent data analysis such as assess the impact of infrastructure investments accessible to communities particularly in expanding services and poverty alleviation; identify the role of maintenance and sustainability in preserving the value of infrastructure assets and evaluate infrastructure investments management in achieving sustainable outcomes through reviewing different reports and other useful documents. The objectives were to develop a base of knowledge about the Infrastructure investment as a tool for poverty reduction in Rwanda case study of LODA. These objectives were accomplished and some findings presented in this chapter demonstrate the potential for merging theory and practice.

Table 1: Budget by Programme for Infrastructure Development and Social protection initiatives in LODA (2008-2012/2013)

TOTAL BUDGET BY FISCAL YEAR							
Intervention areas	2008	2009	2009/2010	2010/2011	2011/2012	2012/2013	TOTAL
Activity type	28,807,470,289	12,689,558,025	50,537,827,331	62,482,026,914	49,922,185,041	84,729,212,057	289,168,279,657
Infrastructure Projects Development(A)	17,115,165,070	7,824,658,886	38,059,194,183	44,857,026,914	39,910,637,648	68,416,142,511	216,182,825,213
Income generating activities	3,252,342,737	1,217,500,265	6,834,814,473	8,339,652,663	6,240,273,130	10,591,151,507	36,475,734,776
Transport infrastructure (paved roads, earth roads, bridges and asphalt roads)	7,458,372,462	3,416,264,210	17,917,125,379	19,748,554,764	13,528,912,146	30,891,696,812	92,960,925,773
Education infrastructure projects	1,042,025,806	723,304,807	1,880,656,158	3,802,881,614	2,845,564,547	4,360,858,196	14,655,291,130
Health infrastructure Projects	806,609,168	355,307,625	1,415,059,165	1,068,082,196	1,397,821,181	2,372,417,938	7,415,297,273
Water and sanitation Infrastructure	992,808,451	615,486,587	1,495,715,323	1,434,753,844	4,243,385,728	3,701,983,025	12,484,132,958
Agriculture and Livestock production development project	1,003,678,098	214,699,558	1,234,420,949	3,152,729,950	3,195,019,843	1,422,669,572	10,223,217,970
Energy infrastructure	800,287,267	267,439,338	4,649,480,114	3,289,104,744	4,592,841,024	9,795,087,509	23,394,239,996
Administrative infrastructure	1,123,491,341	494,892,763	770,975,266	1,601,971,631	1,270,866,427	1,804,439,270	7,066,636,698

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TOTAL BUDGET BY FISCAL YEAR							
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Activity type	28,807,470,289	12,689,558,025	50,537,827,331	62,482,026,914	49,922,185,041	84,729,212,057	289,168,279,657
Natural resources sustainable management projects	569,400,333	406,065,857	1,017,210,475	1,384,951,082	1,597,509,921	1,711,334,786	6,686,472,453
Feasibility studies and Supervision	66,149,406	113,697,877	832,123,399	1,034,344,426	998,443,701	1,694,584,241	4,739,343,049
ICT Development projects	0	0	11,613,482		0	69,919,655	81,533,137
Social protection							
Social protection projects (DS,FS,Girinka,ubudehe and PW) (B)	11,692,305,219	4,864,899,139	12,478,633,148	17,625,000,000	10,011,547,393	16,313,069,546	72,985,454,445
Social protection projects(DS,FS,Girinka,ubu dehe)	10,634,039,979	3,607,205,287	5,719,438,180	8,647,776,488	5,778,069,628	11,548,937,580	45,935,467,142
Social protection projects(PW)	1,058,265,240	1,257,693,852	6,759,194,968	8,977,223,512	4,233,477,765	4,764,131,967	27,049,987,304
Grand TotalC= A+B	28,807,470,289	12,689,558,025	50,537,827,331	62,482,026,914	49,922,185,041	84,729,212,057	289,168,279,658
Budget for Infrastructure Development D = [C-(DS,FS,Girinka,ubudehe)]	18,173,430,310	9,082,352,738	44,818,389,151	53,834,250,426	44,144,115,413	73,180,274,478	243,232,812,517

Source: CDF, RLDSF and LODA Annual reports (2008 -2012/2013)

According to the above table revealed that since 2008 to 2012/2013 the huge budget allocation to the works, transport sector for road construction and maintenance has increased from 7,458,372,462 rwf to 30,891,696,812 Rwf respectively because Rwanda being a land locked country, physical infrastructure remains a binding constraint to the economic development. However, Rwanda through LODA has made strong efforts to improve Infrastructure provision. Most funding has been provided for projects in the transport infrastructure (Roads and Brigdes infrastructure management sector with 38.22% of budgeting at the first rank, social protection with 30% of total budget at second level,this social protection includes public works of 11.12%, Income generating activities comes at the third level with 15.00%, Energy infrastructure is at forth level with 9.62%, Education infrastructure projects is at fifth rank with 6.03% and water and sanitation infrastructure comes at sixth level with 5.13%. Note that infrastructure development is the key for economic growth and plays a significant role in setting an enabling platform for sustainable economic development in different districts of Rwanda. It encompasses services such as water and sanitation management, power and electricity, telecommunications, roads, education and health services that promote commercial activities and well being of citizens, production and consumption. Further, financial services such as banking, industrial and commercial development, tourism and entertainment centres and other segments also form part of the growth process.

Rate of infrastructure development from primary data

A part from the secondary data, the primary data shows the rate of response of top five infrastructure development as follow:

Table 2: Rate of infrastructure development

	Frequency	Valid Percent	Cumulative Percent
Valid Energy infrastructure	73	18.7	18.7

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Transport infrastructure	78	20.0	38.7
Water and sanitation	46	11.8	50.5
School infrastructure	64	16.4	66.9
Health infrastructure	20	5.1	72.1
Agriculture	36	9.2	81.3
Environmental protection	3	.8	82.1
Projects studies and their supervision	1	.3	82.3
Income generating activities projects	69	17.7	100.0
Total	390	100.0	

Source: Primary data, 2014

Organizations (CSO) has intended policy frameworks, and programs, that are people-centered and geared towards addressing the needs of the poor in terms of providing better social services as well as attaining a advanced economic performance at the macro and micro levels. Particularly, poverty alleviation programs have focused on the stipulation of basic social services, social safety nets, physical infrastructure, agrarian reforms, improved market access and provision of credit and measures to ensure the sustainability of natural resources and the environment. Human development and provision of infrastructure such as transport infrastructure (paved roads, earth roads, bridges and asphalt roads), income generating activities tourism, energy infrastructure, water and sanitation infrastructure, agriculture and livestock production development project, schools and health facilities among others are also key areas that the country is making progress. The number of infrastructure investment projects including public works projects are totaling 6,366 executed and they are annually disbursed as follow 1,795 in 2008; 1,589 in mini budget 2009; 2,160 in 2009/2010; 2,207 in 2010/2011; 1634 projects during fiscal year 2011/2012 and finally 1,752 projects in fiscal year 2012/2013. The main macro-economic objective of the Government during this period is to have a strong and stable macroeconomic environment favorable for private sector development in that sense LODA created a post of Public, private partnership in Local Economic Development Programs and Projects division in order to implement this strategy in local entities. Respondents further said that Infrastructure investments in District are poorly maintained and simply maintained during the period of the study so that it would be planned in every district' projects for achieving sustainable development.

Source of investments Fund for development infrastructure projects and social protection initiatives

This section illustrates investment source for both development infrastructure projects and Social Protection from both GoR and Donors that were available for fiscal year 2008 up to 2012-2013.

Table 3: Funds presentation by Donor from 2008-2012/13

Base on figures presented in table N°10 and in the figure N°5, the researcher realised that most important LODA' Donors had relative contribution funds totalling 276,277,531,673 Rwf equivalents to 95.55% as follow:

N°	Donors' Name	Total Budget by Donor	Percentage
1	GoR	190,872,509,425	66.01%
2	DFID	20,325,388,324	7.03%
3	Pays-Bas(Netherlands) and Canada	19,220,605,919	6.65%
4	KFW	17,639,893,004	6.10%
5	SIDA	12,140,348,334	4.20%
6	UE (UBUDEHE) DP 2	9,041,928,440	3.13%

7	PENEAR_BAD	7,036,858,227	2.43%
	Total budget	276,277,531,673	95.55%

Source: CDF, RLDSF and LODA Annual reports (2008 -2012/2013)

Rwandan Government contributed much more in infrastructure during the period of 2008-2012/13 because public investments in infrastructure are still expected to bear a large part of the infrastructure needs in backward and remote areas for improving connectivity and expanding much-needed public services. In analysis of the fact that resource constraints will persist to limit public investment in infrastructure, different donors based development needs to be encouraged everywhere possible.

Social protection initiatives

LODA has another division merged Vision 2020 Umurenge Programme (VUP) and UBUDEHE program. So far, VUP operated in 180 sectors countrywide in the period of 2008-2012/13. Those sectors have been selected by the local government; the priority being given to poorer sectors. VUP reduces poverty through the following three main schemes (components): Provide poor individuals with paid works to reduce their poverty (Public Works), Provide direct financial support to poor individuals unable to work (Direct support), Grant loan to poor individuals that is repaid in a 12 month period with 2% interests per year (Financial services).

As the research is concerned; the public works (PW) is only component the researcher deals with because PW projects that were funded and implemented in Social protection include transport, energy projects, school and health infrastructure, environment protection projects, income generating projects, and water and sanitation projects among others. The following table indicates the implementation status of PW Workers, projects and wages.

Table 4: Public works achievements by LODA 2008 -2012/13

Fiscal year	2008	2009	2009/2010	2010/2011	2011/2012	2012/2013	Total
Workers	19,626	17,554	74,683	99,190.21	94,397	89,011	394,461
Wages	1,058,265,240	1,257,693,852	6,759,194,968	8,977,223,512	4,233,477,765	4,764,131,967	27,049,987,304
N° of projects implemented	197	231	210	403	270	338	1,649

Source: CDF, RLDSF and LODA Annual reports (2008 -2012/2013)

The Public Works is the component of VUP which deals with the community asset development projects that generate employment to the local population in the poorest Sectors. The public works is built on labour intensive public works experience which was designed to provide employment in order to gain an income, begin the process of moving out of extreme poverty and create productive sustainable community assets; 1649 projects have been executed with 4,508,331,217 Rwf and employed 394,461 workers during 2008-2012/13. The other wages of remaining infrastructure are not easy to evaluate them because are determined by contractors through public tenders but they have played big roles in the society like: creating significant numbers of jobs both short and long term and raise labour productivity; improved the accessibility situation of the population of many of our communities and lowering production and transaction costs; Public funds have been invested within the country and in particular in the rural areas and increase public and private investment

and income levels for many; Promoting access to safe drinking water and sanitation; access to health services and make use of the resources or assets that rural communities have physical, capital, institutional, technical coupled with a process that gives them some ownership of the facilities provided has been shown to have a high potential for success.

Infrastructure development Projects challenges in LODA are: Lack of sufficient funds of funding all Districts development infrastructure; process of projects delays of the execution; Management and maintenance of Infrastructure projects challenge and Status of monitoring and evaluation (M&E) in the public sector. Infrastructure investments play a significant role in the socio-economic development of the nation. It provides the physical infrastructure that is central to the country's economic development. Its activities create business for suppliers and manufacturers and it provides employment to professionals, semi-skilled and unskilled labour. However, the nation's infrastructure investment is underdeveloped and plagued with a host of problems, which includes a lack of management, operation and maintenance, technical capacity, and access to credit facilities and work opportunities.

Therefore there are not much decisive day to day budget allocated in operation and maintenance of Districts infrastructure for being more affordable through appropriate technical standards and optimal use of local resources. But a solid understanding of poverty allows prioritization of potential public interventions in local infrastructure projects according to expected poverty impact. Social sector programs will commonly be considerable components of the effort, but actions to encourage growth and capacity building, and in other sectors which expand incomes of the poor like rural development, local infrastructure, private sector development for jobs, action to reduce insecurity will usually be of equal importance in an effective program of action to tackle poverty in all its dimensions.

VI. CONCLUSION AND RECOMMENDATIONS

Even if the alleged role of resourceful infrastructure investments as a critical element for economic growth, poverty eradication and the attainment of the Millennium Development Goals (MDGs), there is abundant evidence that Rwanda's infrastructure is much below international standards in terms of quantity and quality. Hence infrastructure investments are essential for the services they provide through two channels: the supply side and demand side impacts. The development of infrastructure improves the supply side of the economy by reducing cost, enhances the business climate, makes room for better access to market opportunities and opens up new opportunities. These supply side effects attract domestic and foreign investment, increasing employment and national output. The demand side effect of infrastructural development occurs when projects are implemented. In this case, the new project, say road construction, energy, water sanitation, Markets... create new jobs through which incomes are generated. The social measurement of improved infrastructure is that it increases access to basic social services, thus improving the living conditions of the poor.

For our local administrative entities a major issue is rural development and investment choices that are associated with this process. Transport is obviously an important factor in their rural development, poverty

alleviation and employment creation strategies in that its existence or absence limits the opportunity that rural people have to improve their social and economic well being. Transport in itself is a means to an end. The transport needs of rural people are connected among indispensable wants such as water, food and firewood, social welfare aspects of rural life such as health and education and through economic welfare aspects of rural life such as agriculture, livestock and home industries.

From the Operation and maintenance manual it can be seen that for annual maintenance and repairs an amount must be earmarked of about 2% of the total value of the infrastructure. The funds that are made available now are not sufficient for proper maintenance. Through the reports reviewed there are no guidelines of putting in place a new management and revenue collection system of income generating activities which is both accountable and transparent inspired by private sector practices and being free from political influences.

RECOMMENDATIONS

Some recommendations have to be made to remove the constraints in increasing Infrastructure investment productivity and pull off relevance growth and poverty alleviation in Rwanda. Actors at different level concerned with the financing, management and maintenance of infrastructure have to adopt some mechanisms: Governments remain at the heart of infrastructure service delivery. With or without private participation; governments remain responsible for infrastructure reform, for setting and enforcing the basic rules of the game, and for regulation. It must: improving poor people's access to infrastructure services; strengthen decentralised planning with beneficiaries; establish cross-sector synergies; ensuring affordability for the poor; provide technical and financial incentives ; improving gender equity, inclusion of the disabled and social safeguards; generating employment; better management of public infrastructure bodies.

To Private Sector

Nevertheless, private investment is likely to remain an important component of infrastructure development in the years ahead. The important thing will be to channel private initiative where it has the greatest likelihood of being successful and to have realistic expectations as to what it can achieve. Some of the problems experienced with private participation reflect basic errors in the design and implementation of such contracts. Private participation should be determined on those aspects of infrastructure that present the majority appropriate risk-reward description, accepting that public finance will stay necessary in other areas. Guarantees for infrastructure projects can be more vigilantly considered to avoid some of the large payouts experienced in the past.

To LODA Management

To help reach the poor and promote pro-poor growth, LODA should support extremely these efforts as well as specifically to: target infrastructure interventions to areas that enable the largest possible number of poor people to engage in productive activities and access social services, using a cross- sector approach linked to MDG outcomes; encourage the involvement of poor communities through, for example, decentralised planning systems that incorporate explicit poverty reduction goals (such as universal coverage for basic services); promote employment creation in infrastructure construction, operation and maintenance; systematically address gender-specific needs when designing infrastructure projects; and prevent or mitigate negative impacts on vulnerable groups and promote inclusion of the disabled, the elderly and minority groups.

Rural Infrastructure Maintenance Systems

We all recognize that maintenance of rural infrastructure is often insufficiently addressed in Rwanda. This is often due to a lack of resources, or a proper understanding of preventive and corrective maintenance mechanisms. Preventive maintenance comprises the repairs and inspections to prevent failures, while corrective maintenance covers the repairs after (a part of) the infrastructure has failed its function(s). An increased use of local resources could be a key to improving maintenance practices and systems. The development of appropriate rural infrastructure maintenance systems deserves a high priority. Implementation by local authorities while engaging local petty contractors could further prove to be a most effective approach for ensuring the continued serviceability of infrastructure.

The impact and sustainability of rural infrastructure, as argued above, is partly based on local participation during planning and implementation. Therefore the use of local resources for maintaining this infrastructure should be seen as another key factor in providing sustainable access in rural areas. Implementation by local authorities while engaging petty contractors could prove to be a most effective approach for ensuring the continued serviceability of infrastructure throughout the country.

Monitoring system

Implementation of the principles must be monitored to ensure intended outcomes and generate lessons. Task team members have agreed to monitor implementation using Logical Framework Approach (LFA). In addition, implementation should be evaluated in collaboration with partner donors, facilitating co-ordinated follow-up at the country level.

Engage in joint monitoring and evaluation – involving donors, governments and other stakeholders – to build and share knowledge. Monitoring and evaluation should also aim to strengthen local research and analytical capacity, by involving government agencies, national institutions, civil society organisations and local consultants.

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