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# Importance of Establishing a Regulatory Framework for Microfinance Institutions

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## Background

Access to finance is a widely talked about subject in relation to economic development throughout the world. In order to facilitate every citizen to engage in a lawful business for a living access to finance is a major requisite. Easy access to finance means that people have the opportunity to select financial institutions and instruments suitable for them without incurring an unreasonably high cost. They should be able to deposit, invest and borrow money as and when they require. These services are provided by financial institutions and the use of financial institutions by majority of people means high level of financial inclusion. The relationship between financial development and economic growth is a widely discussed topic among the academics as well as practicing economists. While there are arguments that financial development is a prerequisite for economic development, some argue that when the economy grows finance follows. However, one of the primary objectives of any government is to improve financial inclusion as a means to support economic development objectives of the country. Development of the financial system i.e. financial institutions, instruments, markets and infrastructure alone does not guarantee that the country's financial system

is sound. It is the resilience of the financial system to external and internal shocks that indicates the soundness of the financial system.

Finance business, usually referred to as acceptance of deposits from the public and payments of interest thereon, lending of such money on interest or investment of them, is a regulated business in many countries of the world. Banks and non-bank financial institutions are the major category of institutions in any financial system. Therefore, when the term "regulation of financial institutions" is referred, it is regulation of banks and deposit taking non-bank financial institutions.

## Financial System in Sri Lanka

The financial system of Sri Lanka like any other country includes financial institutions, financial markets, payments and settlements system, the legal framework and the regulators. Financial institutions (i.e. licensed banks and finance companies (the major players)) and other institutions such as contractual savings funds (EPF and ETF), Insurance companies, Co-operatives and Thrift Societies, Stock Brokers, Leasing Companies etc. too play a significant role in the financial system.

All of the above mentioned components of the financial system are subject to regulation under different statutes under which they are established. Regulation and Supervision of banks is vested with the Central Bank of Sri Lanka under the Monetary Law Act and the Banking Act No. 30 of 1988 as amended. Finance Companies are regulated under the Finance Business Act No. 42 of 2011. In addition, insurance industry, stock exchange and other institutions are regulated /monitored under the respective regulatory authorities/enactments. The objective of regulation of financial institutions is to ensure that they comply with the prudential requirements and do not pose a threat to the stability of the financial system and thereby the depositors and other stakeholders are protected.

### **Microfinance Industry**

Although banking density in Sri Lanka has improved dramatically during the recent past, (17 branches per 100,000 people) there still remains a substantial part of the population without access to formal banking system or excluded from the financial system. The financial requirements of this unbanked segment of the society is served by thrift and savings associations, co-operative societies, government operated programmes and non-governmental organisations engaged in lending activities. The prime target of these institutions is the low income people who have no access to credit or cannot establish proper banking relationship due to shaky financial conditions of the project that they operate or low capacity to transact with banking institutions. Lack of collateral, inability to complete documents, the level of education also prevent them from being included in the formal financial system. As this segment is considerably high in many countries, even world financial organisations, such as The World Bank, International Monetary Fund, The Bank for International Settlements, The Asian Development Bank emphasise the need for providing financial assistance to them as a means of improving their standard of living. Microfinance Institutions (MFIs) that provide small value transactions especially for this segment of the society play an important role in this regard. Today, microfinance business has become so popular that

even large banks have their own micro lending arms or special lending programmes targeting the poor. International conferences, workshops and seminars are conducted regularly to discuss modalities of operation, supervision and regulation of MFIs.

Microfinance business can be broadly defined as the provision of small value financial transactions and accounts with focus on low income groups. Frequently, we see that the terms microfinance and micro credit are used interchangeably. However, provision of small loans is micro credit but microfinance is a wider concept which includes not only credit but also other services, such as leasing, savings, payment and remittances, insurance, social empowerment etc. known as credit plus services. Microfinance is different from conventional banking. The binding with customers and microfinance providers is very high. MFIs usually take a market approach to lending. They use innovative methods such as group lending and individual non-collateralised loans with the option to gradually increase the loan size conditional on repayment and charging interest rates higher than that of formal financial institutions to compensate for high screening, monitoring and contract enforcement costs (Hartarska V and Nodolynyak D, 2007). MFIs that are not banks or the other non-bank financial institutions are not regulated in many countries. When they are not regulated, there are no barriers to entry or exit. They can be operated throughout the country or in a limited locality. In certain instances, their emergence and the disappearance is not known unless the affected parties bring them to the notice of the authorities.

Lending practices of MFIs are also different from conventional banking practices. Sometimes they do not take collaterals. The loans are granted on personal guarantees of the group members. The role of a group member is critical in every aspect including obtaining and repaying loans. Mostly, the microfinance borrowers do not have proper financial information to establish their credit worthiness. The projects are not well established and long-term. They require funds not only for projects but also for consumption smoothing,

meeting family commitments etc. Some MFIs are subject to high political influence too. However the contagion effect of the failure of most MFIs is very little or has no effect because their asset base is very little in the financial system. However, the failure of even a very little microfinance company can have a significant effect in terms of the political and social aspect.

### **Microfinance Business in Sri Lanka**

Microfinance business in Sri Lanka is carried out by the following institutions or programmes.

- Licensed commercial and specialised banks
- Licensed finance companies
- International non-governmental organisations as a part of their various social welfare programmes
- Institutions registered under the Parliamentary Acts
- Various village level organisations primarily formed as mutual benefit associations
- Government operated programmes

### **Licensed Banks (Commercial and Specialised)**

The Licensed Banks (LBs) usually do not engage in microfinance business as their core business activity. However, almost all the banks have their own credit schemes targeted for low income groups with low value loan transactions. At the same time, LBs as agents, can carry out Central Bank or the Government operated microfinance programmes focused on the poor. In such cases their microfinance business is subject to the regulation and supervision of the Central Bank as their normal banking business. Their microfinance business can be a refinance or interest subsidy programme of the Central Bank or the Government or it can be operated with their own funds.

### **Licensed Finance Companies (LFCs)**

The LFCs too, in addition to their core business of providing finance to acquire assets under hire purchase or lease agreements, engage in the microfinance business.

The LBs and LFCs have the advantage of their authority to accept deposits from the public and therefore funds can be mobilised as savings and lend those to target groups. Both these types of institutions are registered with the Central Bank and are regulated under the respective statutes.

### **International Non-Governmental Organisations (INGOs)**

Certain non-profit international organisations conduct microfinance business in addition to their various social assistance programmes. These institutions are not authorised to accept deposits from the public and therefore, the funds received from the parent organisations are being used to carry out their microfinance programmes.

### **Institutions Registered under the Parliamentary Acts**

The institutions registered under the Voluntary Social Service Organisations (Registration and Supervision) Act No 31 of 1980 and engage in providing financial services to the low income people as a part of their social service activities can have the features of microfinance business. Co-operative Societies registered under the Co-operative Law No. 5 of 1972 and engage in rural banking activities too can be considered under this category. Co-operative Societies can accept deposits from their members. Other institutions are the companies registered under the companies Act as microfinance companies. These institutions can be operated on island-wide basis or in a particular administrative division.

### **Various village level organisations primarily formed as mutual benefit associations**

Small scale village level organisations are operated as mutual benefit associations to provide financial assistance to its members by way of small loans. The purpose of establishment of these institutions could be for the provision of financial support for urgent requirements of the members, such as illness, death of a family member, education or marriage of a child etc. But with the accumulation of members' contributions they resort to providing loans on

interest and gradually grow to a level where simple operational procedures are not sufficient to manage the organisation.

### **Government operated microfinance programmes**

The Government too can operate various programmes to provide financial assistance to promote income generating activities among the low income people and to inculcate savings habits etc. Samurdhi, Divineguma and Gemidiriya programmes can be considered under this category. These too have the features of microfinance business.

### **Importance of Regulation of Microfinance Institutions**

The followings are the distinctive features of microfinance compared to conventional banking:

- The lender's personal relationship with the borrower
- Group lending or individual lending based on the analysis of borrower's cash flow
- Lower loan limits with the possibility of gradual increase in the future
- Compulsory savings requirements
- In addition to lending, MFIs can engage in social mobilisation and empowerment activities etc.

Institutions other than the LBs and LFCs may not be important in terms of financial stability perspectives. However, the failure of any small organisation can have an impact on the system. Frequent failures or fraudulent activities reported on these institutions can affect public confidence about the financial system as a whole. At the same time, a substantial portion of the members of the rural poor can be benefitted from these institutions and, collapse of such institutions can be a severe blow to them. Further, INGOs and other organisations can be operated by obtaining

loans from the banking sector. Failure of such institutions can affect the banks' loan portfolio and the payment system. It has also been observed that the operation of these unregulated institutions can create the risk of multiple borrowings by the public, unethical practices of loan recovery, unlawful acceptance of deposits etc. Therefore, the regulation of microfinance industry is important both in terms of depositor protection and system stability.

### **Regulation of MFIs**

The institutions engaging in microfinance business can also vary from banks to village level organisations operated at different levels. Therefore, the regulatory scope of microfinance business should also be different from the regulation of banking or finance business. At present, there are several categories of institutions engaged in microfinance business including government programmes. The statutory bodies that are responsible for efficient functioning of these institutions and programmes do not have a coordination mechanism with the relevant agencies. By introducing a common regulatory system for the microfinance industry, an efficient coordination among such institutions can be ensured and reduce the regulatory risk to MFIs.

Similar to the banking business, microfinance business too is subject to market failures. MFIs—though not exactly similar to banks—borrow short term or collect short term deposits and lend. These loans are relatively long term. When a deposit-taking institution becomes insolvent or lacks adequate liquidity, it can't repay its depositors, and—if it is a large institution—its failure could undermine public confidence enough so that the financial system suffers a run on deposits or other system-wide damage. (CGAP- 2012). Even in the case of institutions that do not take deposits, failure of a large institution can have an impact on the payment system, as such institutions could have borrowed from the banking sector. At the same time, failure of an MFI can undermine the confidence of the public about the financial system. It can create social unrest. Therefore, it can be assumed that the rationale for regulation arises from the view point



of public interest or the promotion of a safe and sound financial system.

Through a survey carried out in 2014 on microfinance practitioners, analysts, regulators and investors in 70 countries it has been found that over-indebtedness, credit risk, competition, risk management and governance are the major risks that the MFIs face over next two to three years' time. Those five risk categories had ranked 6.7 to 7.5 out of total risk rate of 10. (Microfinance Banana Skins 2014. The CSFI survey of microfinance risk. Page 6). At the same time, it had been observed that most of the MFIs are running without proper strategies. When the focus of an institution is not clear, future is also the same. When there is no regulatory mechanism, expansion is unlimited in a competitive environment increasing the operational risk. Even though the total assets of the microfinance sector can be a negligible volume or percentage compared with the total assets of the financial system, the above findings indicate that introduction of a regulatory system will be beneficial to any country.

### **Benefits of Regulation of MFIs**

Information asymmetry is the foundation for the existence of financial institutions. The microfinance regulator can act as the monitor of microfinance institutions for the benefit of the depositors of MFIs as the depositors rely on the regulator. On the other hand, the borrowers know the full details of their capacity to repay. MFIs though do not have full information on borrowers, they can avoid risky borrowers lawfully by way of complying with prudential regulations imposed by the regulator on lending. This is equally applicable to other businesses such as insurance, payments and remittance services offered by MFIs. The regulatory measures relating to capital, liquidity, provisioning requirements, governance, risk management and internal controls imposed by the regulators are major components of the financial soundness indicators. In this manner, regulation can be a solution to overcome the information asymmetry problem regulation can be a solution.

Regulation minimises the systemic risk. MFIs that accept deposits or engage in lending only business, are exposed to contagion risk caused by negative externalities. Regulatory measures such as lender of last resort, deposit insurance, payment system oversight can be taken as a guard against systemic risk. However, some of these measures can be a burden to the regulated institutions.

Regulation usually includes standards for entry into and exit from the market. Unregulated industry can be flooded with institutions entering at good times and exiting at bad times without notice of the authorities or the customers thereby undermining the confidence of the public about the system as a whole. Also, the regulator can create an environment for a competitive market by way of bringing in regulations relating to registration requirements, mergers and acquisitions, closure of business, governance practices and disclosure requirements etc. This can prevent unauthorised entry or exit and unethical business practices of the MFIs.

Regulation of MFIs can be justifiable from the perspectives of Anti-Money Laundering (AML) and Combating Financing of Terrorism (CFT). Sri Lanka is committed to implement 40 recommendations of the Financial Action Task Force (FATF) under which customer due diligence, know your customer (KYC) rules, and the requirement of reporting suspicious transactions and record keeping and regulations on investing in prohibited schemes need to be implemented. Also, with the increase of per capita income, there can be a possibility of converting certain non-profit organisations into for profit organisations. Therefore, in order to create a level playing field and to be par with international standard bodies on the need of proportionate regulation and supervision that does not result in exclusion of low income customers, microfinance regulation is important.

Another benefit of regulation of MFIs is customer protection. The customers of MFIs are small scale entrepreneurs. They are the owners and the employees of their businesses. At the same time

they borrow not only for business purposes but also for consumption and to meet the expenses of their urgent family requirements. Their savings are small in value but important for them. Existence of the MFI is vital for its members. Regulation can protect their investments and financial source through the imposition of minimum prudential requirements.

## Conclusion

One of the important factors to be considered in evaluating the level of economic development of a country is the level of financial inclusion of that country. MFIs play a vital role in promoting financial inclusion. They cater to the population that has no access to formal financial institutions due to various reasons. They promote financial literacy among the poor. Even though financial inclusion in Sri Lanka is supposed to be relatively high as denoted by the number of people having an account in a financial institution, financial literacy depicted by management of cash, use of bank loans, investment of funds, insurance habits etc. need to be improved further. In order to achieve high level of financial inclusion and financial literacy, a sound and smoothly operated microfinance industry is very much important for Sri Lanka. Proposed Microfinance Act would be a positive step taken in this regard.

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# Importance of Payment and Settlement Systems Oversight<sup>1</sup>

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## Importance of Payment and Settlement Systems

Payment and settlement system is an operational arrangement that connects a computer-network in order to clear and settle bank accounts of various financial institutions and users. Through the system users are able to transmit money and financial instruments from one financial institution to another safely and timely. It is an indispensable tool for operations of the interbank, money, and capital markets including cross-border financial flows. More importantly, payment and settlement systems play an important role in conducting monetary policy operations.

In an economy, almost all economic activities are likely to engage in any mode of payment system. If a transaction is done through financial institutions, safe and timely completion of settlement is necessary. Such completion helps reduce cost of exchanging goods and services. Therefore, the efficiency of a payment and settlement system affects the orderly economic development and growth of a country. If payment and settlement systems are weak the flow of valuable and limited financial resources could be hindered in a severe manner. The result would be losses to the participants and loss of confidence in the financial system ultimately weakening the stability and developmental capacity of a national economy. Therefore, not only the design of payment and

settlement systems but also the operations should be carried out in a proper way. It is a must for regulators to monitor them continuously to give an assurance to users that they have been designed properly in such manner that it is able to adequately contain sudden financial shocks thereby mitigating systemic crises.

Everyday a vast number of financial transactions are undertaken via a broad range of payment systems. The Bank of England operates the United Kingdom's (UK's) Real Time Gross Settlement (RTGS) system infrastructures that lie at the heart of the settlement of Sterling payments and securities transactions. On average, it settles Sterling Pound 575 billion, equivalent to UK annual GDP every three days. In 2013, the UK payment systems have handled nearly 21 billion transactions worth over Sterling Pound 77.5 trillion (BIS, 2014). In 2007, Alan Greenspan has expressed his views on payment and settlement systems to "The Age of Turbulence" that "The Federal Reserve is in charge of the electronic payment systems that transfer more than US dollar 4 trillion a day in money and securities between banks all over the country and much of the rest of the world. [...] We'd always thought that if you wanted to cripple the U.S. economy, you'd take out the payment systems" witnessing the power of the payment system in an economy (quoted from course materials).

According to the definition by the Bank for International Settlements (BIS), a payment and settlement system is a system which consists of a particular group of institutions and a set of instruments and procedures, the design to ensure

<sup>1</sup> The information in this article is mainly based on the knowledge acquired by the author by participating the SEACEN Course on "Oversight on Payments and Settlements Systems" held in China in June 2014.



the circulation of money and speed up interbank and other settlements resulting from the various economic transactions either within a country or between countries. The efficiency of the financial system depends on the smooth functioning of various payment and settlement systems which should be in line with the country's legal framework to avoid disruptions.

### **Types of Payment Systems**

Payment channels are divided into two types based on the characteristics and the volume of fund transaction: large value payments (LVPs) and small/ retail value payments (SVPs/ RVPs), thereby improving the convenience, efficiency and the safety of fund transfers. Large value payments are usually related to money market and securities operations and large value payment and settlement systems (LVPSs) such as RTGS (real value gross settlement system) which clear and settle large value fund transactions. Typically they are time critical and a high degree of security and reliability is required. However, retail payments are not directly linked to the transactions in the financial market. The entities engaged in their execution are usually citizens or legal entities, which do not classify as financial institutions.

Transferring and settling of funds, particularly interbank settlements can be done in two ways: on a net or gross basis. In a net settlement system, running balances of each participant are calculated on a bilateral and multilateral basis. At the end of the clearing cycle only the net amounts are settled for each participant. Typically net settlement takes a day. Till then, all other payments are provisional. Unless controls exist during the clearing period, there may be risks on participants who have net obligations at the end of the clearing cycle. With gross settlement, payments are settled one by one, typically in real time virtually without delays. When interbank settlements are made through the central bank, then payments can be final and irrevocable.

### **Related Risk**

Over the last couple of decades financial market infrastructures (FMIs) have become more and

more connected through simple and complex interrelationships due to the impact of a number of powerful economic forces such as liberalisation, technological innovations, globalisation, regional integration and consolidation on financial markets. The resultant implications on payment arrangements due to these developments could be more and more sophisticated in the future through a number of channels. Increasingly high involvement of the private sector in the economy has also affected payment and settlement systems.

Central Counter Parties (CCPs) and Central Securities Depositories (CSDs) directly link with large value payment systems for delivery versus payments (DVPs). Some payment systems depend on common messaging service providers like SWIFT in less direct ways. Therefore, interdependencies have complicated the risk scenario in payment systems which bring additional challenges requiring participants, operators and regulators to understand risks of participating in a system and look beyond ordinary risk management and control measures. Tightened interdependencies can strengthen global infrastructures but there is a potential for disruptions that could spread quickly and widely across multiple systems.

An initial disruption can arise due to various issues such as credit, liquidity, market, operational and/or legal issues. The disruption could quickly spread throughout the system, financial institution or service provider. As a result, one or more participants in the system may fail to settle their obligations as expected. Due to this emerging systemic risk, other institutions might suffer either liquidity shortfalls or replacement costs or principle losses. If a particular system or institution cannot contain the disruption, resultant shortfalls and losses could lead to settlement delays or failures in the systems. Therefore, identification of various risks, and measuring, monitoring, managing and controlling of those risks are essential to prevent transmission of risks to domestic and international financial markets to avoid the emergence of financial crises.

Payment and settlements systems may encounter three types of financial risks: liquidity, credit and

systemic. In addition, payment and settlement systems are susceptible to operational risk, legal risk and security risk. The operational risk can occur due to failure of software or hardware, human error or malicious activity and disrupt the smooth functioning of a settlement system. Weak legal frameworks or unexpected interpretation of legislation result in legal risk and cause unforeseeable financial losses to the operator or participants of the settlement system. Security risk can occur due to fraud or misuse of the system that will harm the functioning of the system.

A broad risk management perspective and controls are important to mitigate arising risks. Risk management procedures of systems, institutions and service providers at the center of key interdependencies are especially important. The members of the payment systems who are keen on reducing risk are unable to make necessary changes due to the difficulties in coordinating actions among themselves. Although all participants in the payment systems are keen on reducing risk they are unable make necessary changes due to the lack of coordination among themselves. Regulators including central banks have paid close attention to the designing and operation of payment and securities settlement systems, particularly since mid - 1980s. The evolution of central bank policies has also supported central bankers to acquire an expertise in their operations as users as well as operators of systems.

The Committee on Payment and Settlement Systems (CPSS) of BIS is the standard policy setter in this area and focuses them from large value to retail value payments systems, from foreign exchange transactions to securities settlement systems. The CPSS undertook some work in 2008 to identify interdependencies in the CPSS countries and has developed General Guidelines to modify the payment system as a whole. These tasks have increasingly become more complex with increasing competition and innovation that have pushed constantly to limit the provision of stable payment services with better combinations of efficiency, reliability and safety to larger numbers of individual users and institutions.

## **Role of Central Bank**

In 2003, the Bank for International Settlements (BIS) identified that payment and settlement systems oversight is a central banking task. It principally anticipates promoting the availability of safe and sound payment systems (PS) with smooth functioning without disruption through possible “domino effects” which may occur when one or more participants in the payment system suffer credit or liquidity problems. Payment systems oversight aims at a given system (e.g. a funds transfer system) as a whole rather than overseeing individual participants. Accordingly, central bank, as the overseer has several tasks, including the following to carry out:

- Differentiate systematically important payment systems (SIPS) and important payment systems (IPS) in the market.
- Establish or approve the principles and rules of the settlement system.
- Identify the potential risks that could emerge in the payment systems
- Participate in fostering the development of the policy and legal framework in accordance with the oversight principles.

For many years, central banks were not interested in payment and settlement systems due to their mechanical nature and considered it to be a ‘behind-the-scenes’ activity. However, this attitude has gradually changed with the recognition of the crucial role of payment and settlement systems, particularly in the pursuit of core policy objectives of monetary and financial system stability.

Today, many central banks operate one or more payment systems to provide a variety of payment and settlement services to other banks and allow the transfer of settlement assets. For central banks’ key functions of monetary policy operations and provision of banking services to their customers, at least one or more systems are required. Importantly, central banks act as the guardian of public confidence in money. Central banks need to ensure that economic agents are able to transmit

their money and financial instruments securely and timely through payment and settlement systems. As such, strong and reliable payment and settlement systems should be available to the public even in a crisis situation.

As an overseer, central bank should have effective powers and the capacity to carry out their oversight responsibilities efficiently. Oversight policies should be transparent and set out publicly including the policy requirements or standards for systems and the criteria for determining which systems these apply to. They should adopt internationally recognised standards where relevant and apply consistently to comparable payment and settlement systems including systems operated by the Central Bank. In promoting the safety and efficiency of payment and settlement systems, central banks should cooperate with other relevant organisations.

### **Payment and Settlement System Oversight (PSSO)**

The Payment and Settlement Systems Oversight (PSSO) is a process of continuous monitoring of an existing system as a whole to give an assurance to users about its safety, availability, stability and efficiency. Relatively, it is an iterative process and has recently become more formal and systematic. The clarity, transparency and the compliance with the international standards and public policy objectives are most important. However, it should not create inappropriate competitive distortions between comparable systems. The focus should be on the size or risk profile rather than the types of transactions. The PSS oversight consists of following elements covering all different types of risks:

1. Determining scope: The general framework, criteria and standards for the formulation of the policy stance are set;
2. Analysis of risks and issues: The information on the overseen entity is collected to evaluate and analyse the compliance of the implementation of actions with the policy stance;

3. Implementation of the policy stance: Suitable actions are taken to induce to the system to follow the criteria and standards by using formal regulatory powers. Alternatively it could be done through moral suasion.

According to international standards and best practices, as overseers, central banks should guarantee that the settlement systems including the systems operated by them are fully complied with as per international standards. Therefore, central banks should have the required powers to influence the systems and adequate knowledge including different payment and settlement systems, resources, tools, appropriate organisational structure, enabling to perform their oversight functions professionally. Most prominent available tools are moral suasion, public statements, voluntary agreements and contracts, participation in systems, cooperation with other authorities, statutory power to require change and enforcement and sanctions. This knowledge is a prerequisite to decide which individual system is sufficiently relevant to the broad policy objectives or standards of safety and efficiency which the central banks are trying to achieve. In order to promote the safety and efficiency of payment and settlement systems the overseers should cooperate with other relevant organisations. It should also consider the other public policy objectives such as control of money laundering, consumer protection and the avoidance of anticompetitive practices when designing and operating payment and settlement systems. Central banks could set out their own criteria while determining the scope of the oversight that is essentially included new instruments and players.

There should be a dedicated team that consists of colleagues with different expertise to ensure adequate, comprehensive and all-round knowledge

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2. Payment systems are a major channel for transmitting money. If a payment system or a participant fails, the effects can spread through domestic and international financial systems and markets. A failure may threaten the stability of the currency and the financial markets. If the failure of a system or a participant can cause other participants to fail and is thus able to transmit shocks within the financial infrastructure, such a system is called a systemically important payment system (SIPS).

to discharge oversight duties. Duties of each member with respect to oversight functions should be clearly defined and segregated from payment operations and development functions to avoid conflict of interest. For example the team in the Hong Kong Monetary Authority consists of colleagues with background knowledge on payment operations, risk management, IT, audit, accounting, economic research and communication.

Often central banks have a wide range of sources of information, such as documentation and reports, onsite inspections, other regulators and customer feedback etc. Usually, central banks have voluntary provisions as well as legal and general powers to obtain information for the collection of statistics. However, duplication of information collection needs to be avoided. Effectiveness of the oversight crucially depends on the central banks' expertise and understanding of functions of key payment and settlement systems and the inter-connections of each other as part of the overall financial system.

### **Importance of Cooperative Oversight**

Central banks' oversight powers are limited to domestic systems. Systems that are located abroad, though relevant to the domestic systems are usually ignored. If such systems provide services to the national economy there is a possibility of exposure to systemic risk. Therefore cooperation between central banks and systems located outside of the country and other supervisory authorities (both domestic and foreign banking supervisors, securities regulators etc.,) may also be important.

#### **Cooperative oversight**

- allows coordination and consistency of approaches, minimising risk of conflicting requirements
- avoids “gaps” of authority and mismatch between responsibilities and powers
- avoids unnecessary duplication of activities and reduces costs
- promotes consistent oversight and supervision approaches

### **Issues and Challenges for Central Banks**

Issues and challenges associated with payment and settlement system oversight could be varying from country to country. However, the following issues and challenges could be common to all:

- Although policies cannot be developed overnight, objectives can change over time. If regular change in policies could affect reputation, different personalities and sentiments associated with organisations could hinder the formulation and communication of the central bank objectives, views and research vis-à-vis innovations in a transparent manner. To a certain extent, directions may not be in-line with objectives due to political influence or lobbyists.
- The available data may be inaccurate/ insufficient/ non reliable. Data may not be available or very hard to obtain.
- Unidentified new risks could arise with the fast evolution of technology. To face such threats pro-active supervisory oversight should be carried out through regular monitoring and assessing new developments (collection of relevant data, building expertise). More stringent security controls should be adopted.
- Impact of innovations offered by the central bank on the payment services, on cash provision and on monetary policy is necessary to assess. For better performance, a wide range of expertise on oversight duties (e.g. operation, technology, risk management etc.) is required. Knowledge gap could exist as the overseers may not be able to acquire in-depth knowledge on financial market infrastructure (FMI) (e.g. operation workflow or technology advancement). Therefore, sometimes involvement of external expertise may be requisite.
- Necessity of cooperation with other central banks and authorities (at a national and international level) and establishing collaboration and cooperation with industry with players and maintaining a good



relationship with them might not be at satisfactory level.

### **Roles of International Standards: CPSS-IOSCO Principles for FMIs**

In March 2011, the Committee on Payment and Settlement Systems (CPSS) and the International Organisation of Securities Commissions (IOSCO) issued the principles for financial market infrastructures (PFMIs) which contain new and more demanding international standards for payment, clearing and settlement systems, including central counterparties (CCPs) for public consultation. The new standards are designed to ensure that the infrastructure supporting global financial markets is more robust and thus well placed to withstand financial shocks.

The new PFMIs, finalised in April 2012, have replaced the three existing sets of international standards set out in the Core Principles for Systemically Important Payment Systems (SIPSS) (CPSS, 2001); the Recommendations for Securities Settlement Systems (CPSS-IOSCO, 2001); and the Recommendations for Central Counterparties (CPSS-IOSCO, 2004). CPSS and IOSCO have strengthened and harmonised these three sets of standards by raising minimum requirements, providing more detailed guidance and broadening the scope of the standards to cover new risk-management areas and new types of FMIs. The CPSS and IOSCO members strive to adopt the standards of a single, comprehensive set of 24 new principles which have been designed to apply to all SIPSS, central securities depositories (CSDs), securities settlement systems (SSSs), CCPs and trade depositories (TRs) (collectively "financial market infrastructures").

### **Concluding Remarks**

Payment and settlement systems oversight has become one of the key tasks of central banks in order to maintain financial system stability as a whole. This role ensures its participants the availability of safe and reliable payment and securities settlement

systems. By improving governance and adequacy of infrastructure, efficiency could be increased. Effective governance of payment systems is essential to ensure that all user needs are satisfied. Governance arrangements should be clearly articulated, coherent, comprehensible, and fully transparent.

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# Impact of Digital Divide on Economic Growth

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## Introduction

Economic growth model explains that economic growth is influenced by several factors such as capital, population growth and technological improvement. Among these factors, digital divide is directly related to technological improvement. Under contemporary development discourse, a large number of inequalities such as income disparity, gender inequality and information asymmetry etc. are pointed out by many philosophers and development practitioners as obstacles for the overall development process. Digital divide is based on information asymmetry. Digital divide is one major obstacle which can influence the transformation of the economic process from a traditional production structure to a modern innovative production structure which is promoted by many countries as this knowledge based development is an indispensable factor to avoid middle income trap and obtain high economic growth.

## Digital Divide

As explained by Fong (2009), digital divide became a main topic of political stream in USA in 1990. Chinn, Menzie D. and Robert W. Fairlie (2004) defined digital divide as “A digital divide is an economic and social inequality according to categories of persons in a given population in their access to, use of, or knowledge of information and communication technologies”. Accordingly, the gap of information accessibility

and gap of knowledge on using information and communication technology are known as digital divide. Norris, P (2001) defined it as follows: “The divide within countries (such as the digital divide in the United States) may refer to inequalities between individuals, households, businesses, or geographic areas, usually at different socioeconomic levels or other demographic categories. The divide between different countries or regions of the world is referred to as the global digital divide”.

According to Norris, digital divide is a widely spread gap of accessibility and use of digital technology among multiple social stratifications. Further, he identified three surfaces of digital divide, namely global divide which encompasses differences among industrialised and developing nations, social divide which points to inequalities among the population within one nation and democratic divide which refers to the differences among those who do and do not use digital technologies to engage and participate in public life (Hargittai.e, 2003).

People’s access to information and communication technologies is the manner in which digital divide is gauged. Therefore, the prevalent ways of measuring digital divide is through keeping track of the changes in the access levels and the advancements in prevailing as well as innovative technologies. As such, the following can be listed as indicators of digital divide:

1. A gap in the access to use ICTs (information and communication technologies) -

Measured by the number and density of telephones/mobile phones or web-enabled computers etc.

2. A gap in the ability to use ICTs -

Measured, based on skills such as information literacy, computer literacy and the presence of numerous complimentary assets including computer facilities.

3. A gap in actual use of ICTs -

Measured by the minutes of telecommunications for various purposes, the number and time of online users, the number of internet hosts, and the level of electronic commerce.

4. A gap in the impact of ICT usage -

Measured by financial and economic returns.

Digital divide is measured by many researchers and institutions in various countries, and the link with the economic growth and its importance is identified.

### Impact on Economic Growth

There is a positive relationship between economic growth and technological improvement based on various economic theories. "ICTs have the potential in alleviating poverty in poor countries. These technologies have also been viewed by governments and international aid agencies as important tools for national integration because they are capable of enabling greater access to health and education services, and creating economic opportunities for underprivileged population groups" ((Jensen, 2007; Mercer, 2001; Oberski, 2004) sighted from (Fong M. W. L, 2009, 2)). Further, bridging digital divide helps to improve economic growth in various ways such as trade, employment and education.

Bridging digital divide is more important to improve trade activities of every country. Trade activities are mainly based on transactions between

buyers and sellers. On that basis, these two parties always attempt to find the most favorable price for each of them to exchange goods. Therefore, awareness of price is significant to both buyer and seller for their own benefits. However, it is difficult to have all the price information required in a modern decentralised market due to information asymmetry. Therefore, bridging digital divide is important to minimise existing lack of awareness on market activities among economic agents. Further, it helps to reduce transaction costs such as searching and collecting.

At the same time, bridging digital divide is important to share trade related information at an international level. It means that development of ICT infrastructure will help to improve international trade. In addition, tourism industry can also benefit from bridging digital divide, where tourists can be provided with required information by using digital media such as e-books, websites and other internet sources. For example providing maps, hotels bookings and large number of tourism related services can be provided through digital media. Therefore, bridging digital divide will enhance the tourism sector, thereby supporting overall economic growth.

Bridging digital divide facilitates the increase of employment prospects for people in various sectors. Improving ICT infrastructure can provide remote access for people from various places. Accordingly, ICT development creates a new phenomenon enabling companies to facilitate outsourcing of employees from different locations of the world. Companies can take advantage of external labour market inputs within a short time period through off-shore BPOs. The most significant impact of bridging digital divide is, professionals in developed countries have opportunities to provide their services across borders for research and development (R&D), computing, inventory management, quality control, accounting, personnel management, secretarial support, marketing, advertising, distribution and legal services, etc. Further, housewives and disabled persons can also be connected to the labour market through the ICT system. Therefore, bridging

digital divide is an important factor to expand labour markets of countries throughout the world. Another significant impact of bridging the digital divide is that it contributes to improve productivity of manufacturing processes through improving efficiency and quality of the production process. On the other hand, there is a positive impact of developing ICT infrastructure on increasing labour productivity. On that basis, it can be concluded that increasing productivity in the manufacturing process through bridging digital divide can benefit the economy in the long run.

In addition, minimising digital divide influences the improvement of the level of higher education and technological competency. It means that there is an indirect impact of bridging digital divide on economic growth through educational sector improvement. Further, it helps to increase the ability of knowledge acquisition and English language competency among students. Consequently, there is a significant impact of improvement of ICT infrastructure on capacity development of employees. Further, Fong (2009) has pointed out several positive aspects of bridging digital divide on the development of society as follows:

1. Social equality: Digital technology facilitates to include some disadvantaged groups into main stream society. For example, gender discrimination due to cultural barriers has made it difficult for women to obtain general education. This will eventually lead to an increase in social inequality. Therefore, digital technology can promote educational prospects for these groups through e-learning processes. (Daly, 2003, and Chen.k, 2004, in Fong, 2009).
2. Social mobility: Use of digital technology will help to improve of status of individuals or groups, because instant higher usability of ICT leads to higher health-care facilities, job-training, wider social networks and higher living standards.
3. Economic equality: Bridging digital divide leads to increased earning potential, employability, financial literacy and learning

potential. Bridging digital divide also assists to increase economic participation of economic agents. It means that economic equality and inclusive economic growth can be obtained through expansion of ICT infrastructure.

4. There is a long-term relationship between innovative production and ICT sector development. Hence, digital technology promotes expansion in production sector, Fong (2009).
5. E-democracy: Increasing usage of information technology helps to improve transparency, data dissemination and participation of general public in the policymaking process. When people receive information on a policy decision they begin to respond to it.

In addition, ICT sector development is important to improve socio-economic surveys and research. Data can be obtained timely and accurately for surveys by using digital technology. On the other hand, services sector can be expanded through bridging digital divide by employing methods such as e-channeling and bookings. Taking above factors into account it can be concluded that the economy is largely benefitted from bridging digital divide through numerous ways.

### Issues on Bridging Digital Divide

Although there are a number of positive impacts of bridging digital divide on economic growth, it is difficult to overcome digital divide due to various reasons. Therefore, it is important to identify such issues and propose solutions to address these issues.

Lack of financial accessibility is one major barrier for computer and internet penetration. High poverty level in developing countries would prevent poor people spending on computers and equipment needed for digital connection. On the other hand cost of computers and other ICT related equipment in developing countries are very high compared to developed countries and as a result a wider digital divide could be seen. Moreover, lack of trainers and learning resources is another



reason for the increase in digital divide among developing countries. There are no sufficient ICT teachers in developing countries and therefore opportunities for courses on ICT are short in these countries. Furthermore, educational institutes in these countries find it difficult to provide broader and deeper knowledge on ICT due to lack of financial and human resources. For example, in the Sri Lankan context the free education system, including higher education, seems unable to provide sufficient services due to lack of resources. Although an ICT related syllabus is introduced into the school curriculum it is not compulsory for a national level main educational examination like GCE Ordinary Level. Lack of strong policies and inefficient institutional frameworks have also lead to the continuation of these problems in ICT development. Therefore, lack of learning resources influence the increase of digital divide in developing countries.

Operating systems of ICT related equipments are mainly based on English language. However, English language skills of people in developing countries are at a low level. Therefore, this language mismatch is also a barrier to ICT diffusion. Further, some cultural attitudes towards modernity can decelerate ICT expansion. For example there is an idea among many elderly people in Sri Lanka that internet based equipments mislead their children. Therefore, they always attempt to control computer activities of their children. Wilson (2000) has categorised these issues on bridging digital divide into four major sectors as follows: (i) financial access which indicates whether users (individuals or whole communities) can afford connectivity; (ii) cognitive access which considers whether people are trained to use the medium, and find and evaluate the type of information for which they are looking; (iii) production of content access which looks at whether there is enough material available that suits users' needs; and (iv) political access which takes into account whether users have access to the institutions that regulate the technologies they are using. Further, Esceter Hargittai has identified that differences in skills of persons is an influential factor which increases digital inequality. According to his explanation, differences in individual skill

levels are influenced by another four sub-reasons given below:

1. Technical means (quality of the equipment)
2. Autonomy of use (location of access, freedom to use the medium for one's preferred activities)
3. Social support networks (availability of others who can assist in the use and size of networks to encourage use)
4. Experience (number of years of using the technology and types of use patterns)

All of above factors or at least one factor can influence the increase of digital divide among individuals, groups, communities and societies. Therefore, solutions should be found to overcome this existing digital divide.

### **Digital Divide and Sri Lanka**

Importance of bridging digital divide for economic growth has been identified by the world's leading countries several decades ago. Accordingly, Sri Lanka also has introduced some policy reforms to develop the ICT sector in early 1990s. Privatisation of telecommunication sector and encouraging Foreign Direct Investment (FDI) are most influential among such policies which can help to minimise digital divide within the country. As a result of the above policy implementation, Sri Lankan people experienced GSM in 1995 and GPRS in 2001. Further, two mobile service providers acquired 3G in 2006 and 3.5G in 2007. Currently it has become possible for almost all mobile service providers in Sri Lanka to access 4G technology. However, digital divide is still at higher level among the population residing out of Colombo. Therefore, the government has taken a number of steps to bridge digital divide in rural areas, establishing the Information and Telecommunication Technology Agency in 2003 and implementing the e-Sri Lanka project (Kapadia, 2005). The following statistics provide more information on ICT penetration in Sri Lanka:

**Table 1: Percentage of Telecommunication penetration in Sri Lanka – 2007-2014**

| Service                      | 2007 | 2008 | 2009 | 2010  | 2011  | 2012  | 2013  | 2014  |
|------------------------------|------|------|------|-------|-------|-------|-------|-------|
| Density (wire L+WLL)         | 13.7 | 17.0 | 16.8 | 17.1  | 17.3  | 17.0  | 13.2  | 13.0  |
| Density (including Cellular) | 53.5 | 71.9 | 86.6 | 100.7 | 105.1 | 116.9 | 112.4 | 120.0 |
| Density (Cellular)           | 39.8 | 54.8 | 69.8 | 83.6  | 87.8  | 100.0 | 99.2  | 107.0 |
| Density (Internet)           | 1.0  | 1.2  | 1.2  | 2.4   | 4.0   | 6.7   | 9.8   | 16.4  |

Source: Telecommunications Regulation Commission of Sri Lanka

According to the above table which reflects the digital divide on a national level, telephone usage has more than doubled from 2007 to 2014. On the other hand, internet penetration per hundred inhabitants has also increased from 1.0 per cent to 16.4 per cent throughout the respective years. Even though internet penetration increased rapidly, availability of internet access is relatively less compared to telephone connections. It could be identified as a major barrier to bridge the digital divide. On the other hand, slow internet penetration

levels of the country. According to the Computer Literacy Survey Report January-June 2014 released by Department of Census and Statistics there is a tremendous inequality in availability of computers among provincial and sectoral levels in the country.

Table 2 illustrates that there is a significant deviation on the growth of acquisition of computers among provinces and sectors. In 2004, computer ownership level in urban sector was 10.5 per cent while that of rural and estate sectors were 3.1 per cent and 0.3 per cent, respectively. However, by

**Table 2: Percentage of Computer Owning Households by Sectors and Province 2004, 2006/07, 2009 and 2014**

|                  | Desktop (%) |            |             |             | Desktop or Laptop (%) |             |
|------------------|-------------|------------|-------------|-------------|-----------------------|-------------|
| Sector/ Province | 2004        | 2006/07    | 2009        | 2014        | 2009                  | 2014        |
| <b>Sri Lanka</b> | <b>3.8</b>  | <b>8.2</b> | <b>10.6</b> | <b>16.6</b> | <b>11.4</b>           | <b>22.4</b> |
| Urban            | 10.5        | 17.8       | 23.6        | 25.8        | 26.3                  | 35.8        |
| Rural            | 3.1         | 6.9        | 9.2         | 15.3        | 9.8                   | 20.4        |
| Estate           | 0.3         | 1.1        | 3.1         | 2.7         | 3.3                   | 4.6         |
| <b>Province</b>  |             |            |             |             |                       |             |
| Western          | 8.4         | 16.4       | 19          | 24.5        | 20.7                  | 33          |
| Central          | 3.3         | 6.7        | 9.7         | 18          | 10.4                  | 23.5        |
| Southern         | 2.2         | 4.9        | 6.6         | 16          | 7.2                   | 21          |
| Northern         | N.A.        | N.A.       | N.A.        | 10.8        | N.A.                  | 19.5        |
| Eastern          | 1.2         | 3.7        | 5.8         | 9.6         | 5.9                   | 14.7        |
| North - Western  | 3.1         | 4.8        | 6.9         | 14.5        | 7.1                   | 20.1        |
| North - Central  | 1.4         | 2.7        | 6.1         | 7.4         | 6.8                   | 10.1        |
| Uva              | 0.4         | 2.7        | 4.6         | 9.2         | 4.9                   | 11.1        |
| Sabaragamuwa     | 2           | 3.3        | 7.3         | 13.7        | 7.5                   | 16.6        |

Source: Department of Census and Statistics

can negatively affect the development of Business Process Outsourcing (BPO) industry.

Provincial and sectoral level statistics clearly show that there is a deviation of digital divide at different

2014, it has increased to 35.8 per cent 20.4 per cent and 4.6 per cent in respective sectors. Accordingly, computer ownership in the urban sector has rapidly increased and there is a slower growth noted in the estate sector. Hence, existing digital divide is

directly attributable to these sectoral disparities. In terms of provincial level, computer ownership in the Western Province has increased from 8.4 per cent in 2004 to 33 per cent in 2014. In contrast, in the North Central Province, it has increased only to 10.1 per cent from 1.4 per cent during the same years. It is clear that there is a voluminous asymmetry of computer availability in provincial level. This is one of the key factors causing digital divide in the country. Another important factor for the increasing digital divide is disparity in usability skills of digital technology. In the Sri Lankan context, it can be derived through computer literacy rate which is known as the computer literate population expressed as a percentage of the total population.

**Table 3: Computer Literacy in Sri Lanka by Sector / Province**

| Sector/ Province | Computer Literacy Rate (%) |             |             |
|------------------|----------------------------|-------------|-------------|
|                  | 2006/07                    | 2009        | 2014        |
| <b>Sri Lanka</b> | <b>16.1</b>                | <b>20.3</b> | <b>25.1</b> |
| <b>Sector</b>    |                            |             |             |
| Urban            | 25.1                       | 31.1        | 34.6        |
| Rural            | 15.1                       | 19.3        | 23.8        |
| Estate           | 4.3                        | 8.4         | 6.2         |
| <b>Province</b>  |                            |             |             |
| Western          | 23.2                       | 27.7        | 34.3        |
| Central          | 14.8                       | 18          | 24.3        |
| Southern         | 15.6                       | 19.8        | 25.4        |
| Northern         | N.A.                       | N.A.        | 17.5        |
| Eastern          | 11.4                       | 12.9        | 15.9        |
| North - Western  | 12.6                       | 16.5        | 22.6        |
| North - Central  | 8.9                        | 14.1        | 15.3        |
| Uva              | 9.9                        | 14.7        | 17.1        |
| Sabaragamuwa     | 12.3                       | 19.1        | 22.6        |

Source: Department of Census and Statistics

This table highlights following trends in computer literacy rate in Sri Lanka:

1. Urban sector has obtained the highest computer literacy rate while the lowest computer literacy rate is recorded in the estate sector.
2. Western Province has achieved the highest computer literacy against the lowest recorded in the North Central Province.

3. Western Province and Southern Province are above the average of country level (25.1 per cent) in 2014 while others are below the average of country level

Therefore, it can be concluded that there is a huge contribution from the disparity in computer literacy rate among provincial and sectoral levels toward increasing digital divide.

**Table 4: Computer Literacy in Sri Lanka by Gender, Educational Attainment and Language literacy in 2014**

| Gender, Educational attainment and Language Literacy | Computer literacy rate (%) |
|------------------------------------------------------|----------------------------|
| <b>Sri Lanka</b>                                     | <b>25.1</b>                |
| <b>By Sex</b>                                        |                            |
| Male                                                 | 27.0                       |
| Female                                               | 23.3                       |
| <b>By Educational Attainment</b>                     |                            |
| No schooling                                         | 0.5                        |
| Below grade 6                                        | 8.9                        |
| Grade 6 - 10                                         | 16.1                       |
| G.C.E. (O/L)                                         | 39.0                       |
| G.C.E. (A/L) or above                                | 68.0                       |
| <b>By Language literacy</b>                          |                            |
| Sinhala                                              | 30.4                       |
| Tamil                                                | 25.1                       |
| English                                              | 67.3                       |

Source: Department of Census and Statistics

According to the above table male computer literacy rate is higher than that of the female literacy rate, reflecting a gender gap in digital divide. On the other hand, there is a positive relationship between computer literacy rate and educational attainment, indicating higher literacy at higher educational achievements. In addition, computer literacy rate is at a higher level of 67.4 per cent when English language skills are available while computer literacy is limited within the groups of Sinhala and Tamil speakers which accounted for 30.4 per cent and 25.3 per cent respectively in 2014. Accordingly, digital divide differs according to gender, educational achievements and English language skills. Therefore, In order to mitigate

digital divide, policy formulation should be focused on above factors.

### **Suggestions for bridging digital divide**

Although a number of steps have been taken by the government to bridge digital divide, it still exists at a higher level in the Sri Lankan context. Therefore, a formal programme should be introduced to overcome the above issue. In order to achieve these objectives, the following activities can be proposed:

1. Conducting research and surveys to identify issues on existing digital divide-

As highlighted in the previous section, digital divide is highly reflected in sectoral and provincial levels. On the other hand digital divide is caused by some socio-economic factors such as income level, language skills and gender disparity. In addition, there can be other issues which are not identified. Therefore, as a first step we should identify all the aspects and issues regarding the existing digital divide through conducting a formal series of research.

2. Introduce a new national e-policy-

After identifying issues on existing digital divide through conducting research a set of national level policies should be introduced to address such issues. This new policy framework should be formulated by using the expert knowledge of respective private and government sector officers.

3. Establish a national level mechanism to regulate and monitor knowledge based digital activities of country-

The Sri Lankan Government established the Information and Telecommunication Technology Agency (ICTA) in 2003 to bridge digital divide in the country (Kapadia, 2005). Although 12 years have passed since the establishment of this institute, digital divide is still at higher level in the country. It reflects that the contribution of this institute is not sufficient to bridge the existing digital divide. Therefore, government should take additional and proactive measures to achieve this objective. Further, all information and telecommunication

technology related activities in the country should be monitored through such institutes.

4. Improve teaching and training facilities-

Information and telecommunication has already been introduced into school education. However, there are no qualified teachers in many rural schools to teach this subject. Therefore, teachers should be trained in this subject. In addition to that, a new syllabus should be introduced to schools and higher education institutes and existing syllabuses should be updated. On the other hand computer based training prospects for officers in the government and private sectors should be increased and courses should be introduced at affordable prices.

5. Expand market prospects for the information and telecommunication industry-

Appropriate fiscal incentives should be introduced to encourage investments on information and telecommunication technology. It will help to increase competition in the market, thereby reducing prices of IT services and equipment.

6. Establish community access points for internet-

The recent government's project on free Wi-Fi zones is a good initiative which is being implemented by the present government to bridge digital divide. This project should be further expanded and the quality of the service should be improved.

Many developing countries attempt to improve knowledge intensive economic activities to avoid middle income trap. On that basis bridging digital divide is important to obtain high economic growth for developing countries. However, when expanding digital technology, developing countries should be careful regarding matters of internal information secrecy, web based money laundering, cyber attacks and other cyber crimes.

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## REVIEWER ACKNOWLEDGEMENT

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### Introduction

Over the last decade, there has been a growing interest towards using renewable energy<sup>1</sup> in both developed and developing countries, realising its sustainability, economic benefits and more importantly, its less adverse impact on the environment. Hence, the share of renewable energy to total world electricity generation has increased to 23.6 per cent in 2014 in comparison to 19.4 per cent in 2005.

### Benefits of Renewable Energy Development

Renewable energy offers multi-faceted benefits from its very nature that include sustainability, climate safe future, augmenting economic growth, creating new jobs and enhancing human welfare. The renewables play an important role in contributing towards the transition to low-carbon growth through decarbonising the global energy mix. During the last few decades, the demand for electricity generation has boosted at a higher rate than the population growth due to improved quality of life across the globe. A large part of this increased demand was met through burning fossil fuel damaging the environment. Hence, there is a growing consensus on the threat of climate change brought on by increasing atmospheric concentrations of greenhouse gases, encouraging worldwide efforts to reduce emissions. The average Carbon-Dioxide (CO<sub>2</sub>) emission intensity of power generation through coal, fuel oil and natural gas are 960, 800 and 450 grams per kWh, respectively, while renewables ensures zero emission<sup>2</sup>. The seventh goal of Sustainable Development Goals (SDGs) of United Nations (UN) emphasises the development of renewable energy while ensuring economic growth imperative to decarbonised economies across the globe. Enhancement of the share of renewable energy will significantly reduce CO<sub>2</sub> emissions, thereby, slower the rise in global temperatures preventing catastrophic climate change.

The role of renewable energy has become even more important in the context of sustainable development and energy security. The International Renewable Energy Agency (IRENA) forecasts that doubling the share of renewables in the global energy mix by 2030 would increase global GDP by up to 1.1 per cent supported by a higher rate of electrification of end uses. Encouraging renewable energy generation helps to improve trade balances stemming from the ripple effects on economies of oil importing countries together with improved energy security due to a greater reliance on indigenous sources, mostly available almost at zero cost, while creating

local value addition and employment opportunities. Development of renewable energy creates jobs than fossil fuel technologies which are not only for highly skilled workforce, but also for low income groups through community based approaches. For example, solar photovoltaic deployment creates twofold jobs compared with coal or natural gas. Most of the jobs are created from fuel supply such as firewood for bioenergy and equipment installation and manufacturing together with home grown technologies along their value chains. Further, renewable technologies are suited to rural and remote areas due to its capability of providing off-grid services and lower transmission losses, thereby promoting productive uses, spurring education, allowing access to modern communications and offering a host of new opportunities that can facilitate rural development while reducing poverty.

### Composition of Electricity Generation and the National Energy Policy

Electricity generation in Sri Lanka was primarily driven by hydropower till late 1990s. However, the increasing demand for electricity in line with the economic growth and increasing electrification, thermal power plants were added to the national grid from early 1980s.<sup>3</sup> By end 2015, Sri Lanka's major hydropower installed capacity was 1,377 MW while fuel oil, coal and nonconventional renewable energy (NCRE) installed capacities were 1,115 MW, 900 MW and 458 MW, respectively. NCRE comprised 306.7 MW of mini-hydropower, 126.9 MW of wind power, 13.1 MW of biomass power, 10.5 MW of dendro<sup>4</sup> power and 1.4 MW of solar power.

Sri Lanka has already exploited its major hydropower potential and only 186 MW of more capacity could be added to the system through the major ongoing projects. Therefore, the national energy policy and strategies of Sri Lanka currently focused on NCREs. The initial target of national energy policy to generate 10 per cent of total electricity generation via NCRE by 2015 has now been successfully achieved with a contribution of 11.2 per cent compared to 3.7 per cent recorded in 2006, when the initial policy target was set. Later, the target was revised to 20 per cent to be achieved by 2020. The recently formulated Sri Lanka Energy Sector Development Plan for a Knowledge-based Economy: 2015-2025 by the government, envisages to develop the full potential of renewables and other indigenous resources in order to become a nation self-sufficient in energy by 2030. This has set up several targets such as increasing the share of renewables in primary energy supply<sup>5</sup> from 3 per cent in 2013 to 34 per cent by 2030,

1 Renewable energy is a form of energy that emanates from resources which replenish naturally on a human timescale, such as sunlight, wind, rain, tides, waves and geothermal heat.

2 Biomass is almost carbon neutral on net basis, as the carbon emissions released during combustion are recaptured during re-growth of trees.

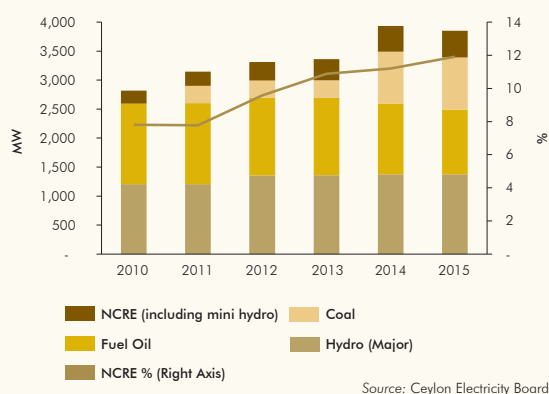
3 Chunnakam thermal power plant was established in 1958 to electrify Jaffna Peninsula, however, Jaffna had not been connected to the National Grid till 1973.

4 Dendro power is the generation of electricity from sustainably grown biomass.

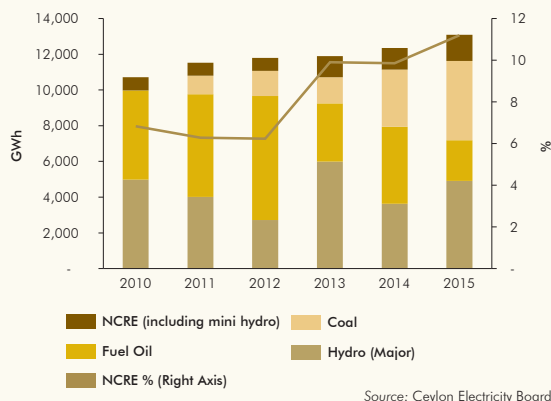
5 Excluding hydro and biomass used as firewood.

electricity generation from renewable energy to 60 per cent by 2020 and biomass electricity generation and reducing the carbon footprint of the energy sector by 5 per cent by 2025. NCRE is expected to comprise with 873 MW of mini-hydropower, 401 MW of wind power, 161 MW of solar power and 153 MW of biomass power by 2030 in achieving those targets.

**Chart B 4.1** Installed Capacity



**Chart B 4.2** Electricity Generation

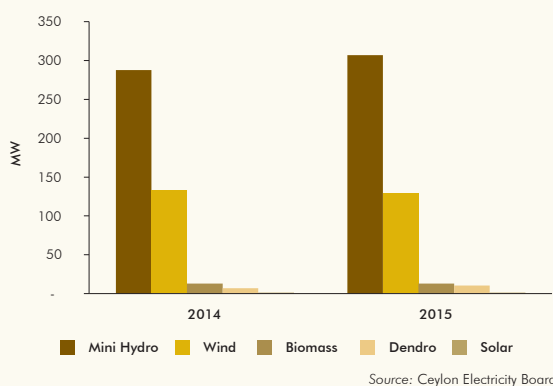


### Opportunities Available for the Development of NCRE Sector

The country has achieved its first milestone of 10 per cent of total electricity generation via NCRE by 2015. However, it depends on weather conditions as mini hydro contributes to 66.9 per cent out of current total NCRE installed capacity. Hence, Sri Lanka has to reap the vast NCRE resources available as a natural inheritance in the country, to achieve the targets, despite it is being immensely challenged by the expected high growth in electricity demand. Although, Sri Lanka has already tapped all major hydro resources, still there are water conveyance structures particularly to low head turbines which

remain mostly unused while extraction of hydropower potential from irrigation networks remains mostly unattempted. Further, it has been identified that there is over 1 GW wind power potential in the country particularly in Mannar, Puttalam and Jaffna. The vast availability of biomass resources is often left untapped by the electricity industry while agricultural waste and municipal solid waste also carries potential to generate considerable amount of electricity. Moreover, solar power is one of the most appropriate renewable energy sources as a tropical country while considering its high level of scalability and accessibility compared to other renewable energy sources.

**Chart B.4.3** NCRE Installed Capacity



### Challenges Faced in Developing NCRE Sector

Even though Sri Lanka is blessed with many forms of renewable energy sources, efficient utilisation of these resources is challenging due to many issues associated with techno-economic aspects. Renewables are dispersed over vast regions compared to fossil fuels and other finite resources. Hence, barriers in electricity system to integrate such dispersed resources exists as a severe constraint for development of renewable energy sources. This raises concerns over the efficient collection mechanism for successful utilisation. Moreover, there are capacity constraints in the transmission topology which limits the connectable renewable energy plants. Most renewable sources are located in non-industrialised areas, imposing a heavy burden on long transmission lines between points of injection and load centres. Further, renewable energy sources are mostly limited to non-storage energy chains, since storage solutions are yet to become commercial realities. This leads to issues in fulfilling system operation guidelines, which defines limits on non dispatchable power absorption and limits relating to amount of energy from a single source at any given point of time.

Source: CBSL Annual Report 2015

In addition to above technical barriers coupled with costly solutions, renewable energy is encircled higher initial costs leads to higher prices which has been above the market energy prices as most of the cost elements are encountered at the outset compared to other modes of power generation. This has caused policy makers' concerns on promoting rapid developments in NCRE. Most of the renewable energy technologies such as wind and solar are yet to be developed for their efficient scale. When considering biomass/dendro power which has been competitive with fossil fuels, it incorporates concerns such as higher need of cooling water which raises environmental constraints while the collection, storage and transportation is also problematic.

### Way Forward

Over the past few years, the renewable energy technologies have grown more robust and more efficient. Energy storage technologies are improving fast. Solar photovoltaic prices have fallen by 80 per cent since 2008 and are expected to keep on declining. The cost of wind electricity has fallen nearly by 30 per cent since 2008, making it the cheapest source of new electricity. These developments have made renewables increasingly attractive globally. Hence, the policy makers have an important role in finding best methods of financing and accelerating its deployment. Large scale deployment of renewable energy such as a large scale wind farm in Mannar and positioning large scale biomass/dendro plants appropriately utilising wide spread network of firewood is vital. Since the investments on renewable energy could already have a long run successful track record in Sri Lanka, financial institutions will support in mobilising long-term and low cost financing while more investors would be attracted if there is a long-term commitment to expand renewables as a larger part of the national energy mix. Further, attracting international cooperation and financial flows will also play a major role thereby responding to the most debatable issue of higher initial cost associated with renewables. When the demand for renewable energy

is sustained and expanded, the industry will gradually be able to bring down the startup costs supported by technological advancements. The choices of competing resources shall be based on a long-term economic cost analysis together with environmental and human health externalities while the pricing policy for energy purchasing can be further strengthened with provisions for frequent cost reflective revisions, improved competitiveness among investors through competitive bidding and scenario based assessments together with avoided costs to offset high cost fuel oil generation.

Identifying innovative standalone applications and promoting micro level projects supported by widely available electricity infrastructure is essential to address issues that arise due to sporadic and dispersed form of renewables. Addressing the barriers arising from the electricity system and transmission topology is apparently complex and time-consuming planning and implementation process. However, this could be overcome through an unwavering policy commitment, which will have to be supported by all concerned agencies and regional political authorities. This nature of policy cohesion will smoothen implementation process which will inspire private sector participants, who are currently affected by the apparent misalignment of such agencies and authorities with the national policy intent. All such steps will facilitate to overcome the techno-economic barriers enabling all stakeholders of the country to realise vast range of medium to long-term benefits offered by renewable energy.

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