The Role of Education as a Source of Human Capital on Rural Poverty: A Review of Literature

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Abstract - *Rural area is a geographic area located outside cities and towns. In order to have long term sustainability in rural sector, education as a source of human capital formation plays a major role by empowering the rural people to a right direction in a productive manner for right decision making ability. Hence the education would be a sustainable strategy to uplift the rural sector with agricultural development. Although for last few decades, many subsidiary programs were introduced in order to alleviate rural poverty, still rural sector has poverty. However, there is a structural change in the rural sector due to either subsidies or free education system. Hence, the objective of this review is to explore how educations as a source of human capital would impact on to expand the living standards of the rural sector as identified by literature. For over past two-three decades, large number of studies has been documented in relation to this theme. In the present study substantial amount of published articles were referred in order to grasp the real gravity of the agricultural development in the light of education as a desk research.*

The objectives guiding the analysis of literature are to; understand the relationship between education and human capital development; human capital and human development; human capital and rural agricultural productivity; and human capital as a source of human capital to alleviate rural poverty. This review is instigated by searching key academic databases using relevant search questions. The literature suggests that there is an inverse relationship between human capital and rural poverty

Keywords: human development, labour productivity, agricultural productivity, education, poverty

I. CONCEPT OF EDUCATION

Education is an ongoing process which occurs over a period of time to improve the living conditions of people. In this effort, like other people in the society even the improvement of the farmer's; knowledge, skills, attitudes in agricultural technology, farming activities and methods of agricultural marketing (Rohana et al 2006) etc. are also pioneered by education as the real corner stone's of rural economy. Therefore education plays a major role in improving such knowledge, skills and attitudes of rural farmers in order to empower them as a human capital or as a productive resource. That's why even human capital theory also try to relate education as an investment as a source of non-farm opportunities to improve the ability of investment decisions (Weber et al., 2007) and to develop entrepreneurial skills and other non-agricultural abilities to determine the ability of spotting opportunities and capitalizing education with them (Silva and Kodithuwakku,2005); (Ucbasaran et al. 2000) as a continual effort.

As per the literature, education sharpens the people with skills, knowledge and abilities. These skills, knowledge and abilities have the possibility to make creativity and innovativeness aroused. As the way education creates or enhances one' ability, know-how (Gibbs, 2003), human growth (Barro and lee, 1993), human development (Bhushan and Arya, 2008), skills enhancement (both cognitive and non-cognitive) and productivity.

Gibbs (2003) articulates that pursuing a good education goes hand in hand with knowing how. With such know-how, people can improve their strategic thinking to do these things efficiently and effectively to improve their socio-economic growth rate. In support of this, even Barro and lee (1993) in a study of 129 countries concludes that

education level has a strong explanatory capacity in so far as they highlight the direct positive effects education on growth rates (Bhushan and Arya 2008). As Bhushan and Arya (2008) point out that education improves ones'; explanatory capacity, cognitive skills/qualities that can helps to improve one's creativity and innovativeness. Such creativity and innovativeness are the main ingredients of human capital development of which would be instrumental and materially important in the working place and business. However, as Oxaal (1997) affirms based on human capital theory that education was valued by employers not because of its cognitive skills nature, but because of its non-cognitive qualities and attributes. And further Oxaal (1997) points out that the non-cognitive traits can be encouraged by the education to effect on the attributes required by employees at unskilled, middle and higher levels of the employment because non-cognitive skills can enhance the creativity of a person at any time. Therefore, Oxaal (1997) concerns that the non-cognitive skills are mostly accepted by the employers as it are the basement of creativity and human productivity.

Due to the problem of lack of educational resources in many rural communities, it places the responsibility of building the human capital necessary to fulfill local employment needs into rural schools (Flora, Flora, &Fey, 2008); (Ann and Coleman 2010). But failures within it influence the human development task in the rural sector to desperate. Due to their inability to cater education to rural sector adequately, most certainly they lose the chance of obtaining both cognitive skills and non-cognitive skills of which are reckoned as major pillars in human capital development as indicated by Bhushan and Arya (2008). However such prevailing poor facilities in the rural sector and the schools (Oxaal, 1997), causes people to be more desperate in thinking creatively and acting innovatively. Therefore, creativity and human development which are backed by the education has become a necessity in order to develop the rural sector socially and economically viable in such a way that has been done in the urban and sub-urban sector. Although better education enhances the peoples' creativity, Oxaal (1997) believes that some profiles reaches to peak and then decline beyond a certain age suggests that the skills created by education are prone to be obsolescence and that their productive value declines when technology has outpaced them. This is further up to a contradiction. Because, age is not an obstacle to develop human as technology is a result of education and; and even such technology is also a result of a creativity derived from a better education, hence age is not an obstacle to coincide with technology. That's why education is needed as a continuous process to cater the changing world requirement.

II. EDUCATION: THEORIES OF LEARNING

As per the Text Book of "*Introduction to Human Resource Training and Development*" published by Open University of Sri Lanka, it indicates that education or learning can pass four categories as Reinforcement Theory, Cybernetic and Information Theory (Communication), Cognitive Theory and Experimental Learning Theory. These theories are more toward informal education rather than formal education. In case of human capital formation, more than the formal education, the involvement of informal education is higher as per Weir (1999).

A Reinforcement Theory

The term reinforcement can be explained in its positive sense. "It means commending learners when they have accomplished a task successfully, thus motivating them to continue with their learning. Positive feedback and knowledge of results are important to ensure that effective learning takes place."

B Cybernetic and Information Theory (Communication)

If a task can be divided in to a number of small parts, learning can be easy. As an example if a workshop can be conducted in several sessions to enable the employees to obtain better results, the communication could be easy and effective.

C Cognitive Theory

This theory indicates that the way how people learn to recognize and define problems and experiment to arrive at solutions. This theory indicates that people can identify and explore the things by themselves and hence the possibilities that they can retain such skills or knowledge is longer and it is possible to use it whenever required.

D Experimental Learning Theory

People would like to experiments and learn the things but there are four different aspects of

learning as *activities, reflectors, theorists and pragmatists*

The Actual Experience (Converge)
Some people want to try and do something new, although they fail it. Still they get knowledge as a way of learning. However these people are called to *activities*. Activities enjoy new experiences and opportunities from which they can learn.

Observations and Reflections on that Experience (Assimilates)
Some people want to gather data, observe them, think and assimilate before they do something. They are called *reflectors*. They would like to explore what happened, where the things went wrong, and they review the results and learning.

Conclusions from Experience
They prefer to make their judgment of which they lean. They are called *theorists.* Theorists like to explore methodically. They look through the problems in a step logical way and ask questions. They tend to be analytical.

Planning the Next Steps
These people need to put whatever they learn in to practice, to act quickly and confidently and to see the result. They are called *pragmatists.* They don't want theories but the results. They like to experiment and search for new ideas which they can tryout. To learn like this, people need better education. Even the rural farmers who are successful sometimes must have become *activities, reflectors, theorists and pragmatists* in their life times for many times. This is type of informal educational aspects. This brings new insights in to the production section, agricultural sector and their non-farm opportunities. Therefore, the Knowledge, Skills and Abilities derived by them from three folds of education, makes matters in stabilizing the agricultural productivity being the core concern of the study.

E Education as a Strategy against Poverty
"Education means acquiring knowledge and skills. Weir (1999) in the study of '*The Effects of Education on Farmer Productivity in Rural Ethiopia'* identifies that education is in three folds; ie Formal, Non-Formal and Informal. Formal schooling is usually the term education. Furhter as Chandrakumara (2009) indicates that human capital also is a result of formal, informal and non-formal education. Non-formal education includes agricultural extension, apprenticeships and training programmes. Informal education means wide range of experiences, including 'learning by doing' and migration or other activities which provide exposure to new ideas and facilitate learning. While formal education enhance people's cognitive skills and abstract reasoning ability along with changes in attitudes, non-formal education foster specific information needed for a particular task or type of work. But informal education direct people to form attitudes, beliefs and habits. Formal education, usually known as schooling, is the process of transferring knowledge and skills from one generation to the next" (Janjua et al 2011:156).

As a tool of non-formal education, in case of agricultural extension, Rohana andBandara (2006) indicates that the impact of role of agricultural extension is basically focus on farmers' income, through agricultural productivity. As they defined the agricultural extension is, "*an ongoing, non-formal educational process which occurs over a period of time and it leads to improve the living conditions of farmers and their family members by increasing the profitability of their farming activities. In this activity, to achieve above goals, it expects the improvement of the farmer's knowledge, skills and change of their attitudes in agricultural technology, farming activities and agricultural marketing"(pp.14). However,* agricultural extension assist, guide and direct farmers to identify both farming and non-farming activities which can increase their net income (Rohana et al. 2006). For knowledge empowerment of the farmers or in order to form their human capital aspect, agricultural extension plays a huge role, specially, for the purpose of attaining higher agricultural productivity. Although the Agricultural extension serves as an educational empowerment tool, it serves as a social economic process as well for economic development and social development of the farmers.

As the benefits of education, Chandrakumara (2009) extends his concerns that schoolings brings only private benefits such as employability or productivity but also it extends its benefits to society as external benefits (Weir 1999). Further Weir (1999) and Janjua et al (2011) indicate there are two types of benefits of education; Internal Return (Private Return) and External Return (Social Return) as Chandrakumara refers. As per Weir

(1999) and Janjua et al (2011), the internal return refers the benefits of investment in schooling which may flow to a person who has acquired the education in order to enhance his income-generation ability. External benefit means the benefit accrued to other members of that person's household or village for the purpose of diffusion of new farm inputs and productivity-enhancing techniques. However Chandrakumara (2009:02) refers that social benefit as '*externalities or spillover effect on the entire society*'. However Janujua (2007) and Weir (1999) categorize decision making, employment, job satisfaction, income, health and well-being as private returns. And decision making, family environment, social network, peace and stability, labour force, economic growth as social benefit.

In addition to that Chandrakumara (2009) indicates that school has pecuniary and non-pecuniary benefits to the people those who are having better education or better human capital. In support of that even Zuluaga (2007) concludes that both of pecuniary and non-pecuniary benefits come due to education but not due to schooling as Chandrakumara (2009) indicates. Zuluaga (2007) articulates that pecuniary benefits such as income of individuals where non-pecuniary benefits are non-financial benefits of behavior or abilities or attitudinal changes of individuals flow to an individual's due as the returns to education.

FurtherTabari& Reza (2012) indicate that education can impact; to increase labour productivity, to increase higher efficiency, to have high technology orientations and to go against the law of diminishing returns, to carry out the invention, exploration and innovation and then to increase the productivity, to have an optimal allocation scarce resources.

III EDUCATION AS A SOURCE OF HUMAN CAPITAL

As introduced by Schultz in his book of 'Investment in Human Capital' the term human capital was recognized as the stock of knowledge, skills and abilities that are derived from education. Schultz (1961) classified human capital as the accumulation of skills and knowledge that a people acquire during a span of time period. As Schultz (1961) identified the development of human capital can be categorized in to 5 areas; (1) investment in health and services (2) employment in on the job-training (3) empowerment in education level (4) extension programmes (5) migration due to changing job opportunities. As all these areas give the knowledge, experience and skills to human capital, obviously the education can make a human as a capital or as a resource or as an asset basically due to their better skills, talents, abilities, capacities by which it can achieve various initiatives such as employment opportunities / non-farm opportunities, farm opportunities and etc. On the other hand, all these five areas bring education to individuals from the tri-sources of formal, non-formal and in-formal. Therefore, human capital and education cannot be departed because human capital is a further extension of education. However, Tilak (2001) indicate that the knowledge which is imparted through education has the possibility to increases the productivity of the people and there by their earnings.

Flora et al (2005) on their study on, *'Community capitals: poverty reduction and rural development in dry areas'* defined human capital as; 'the native intelligence, skills, abilities, education, self-esteem and health of individuals within a community'. Tabari& Reza (2012) define that human capital as an accumulation of; science, knowledge, migration, experience, ability, health, regularity and discipline that is stored by education and health workforce in order to increase work efficiency in production. As both of the studies indicate, the concept of human capital is used to increase the productivity of the workforce and then to increase income levels. Further they consider that the costs of health and migration can also be considered as a part of investment in human capital, as health and migration can bring new insights in to a society. However Janjua and Kamal (2011) and Rosen (1989) point out that the stock of people with knowledge and skills is called as human capital, and Janjua and Kamal (2011) refer that the basic source for acquisition of human capital is formal education.

As per Wong (2012) in his article on '*Effects of Education on Sub Saharan Africa'* he has used macro-mincer equation model as the empirical model with human capital stock (H) as has been shown below. The formula for the Human Capital as;

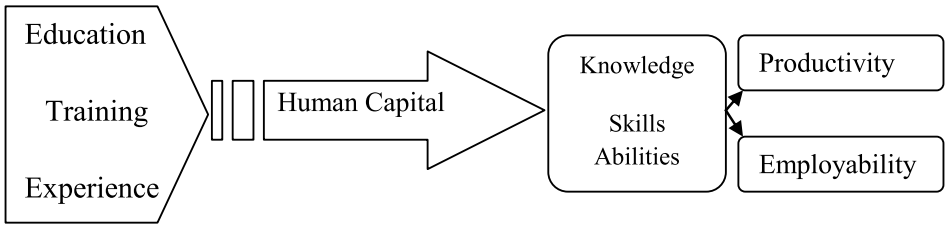
$H=e^{x(s)}$

Where 'S' is the average years of schooling. As he states in support of Solow model that the increase in years of education has an impact on TFP (Total Factor Productivity) and output level of the country. Most importantly Wong (2012) indicates that the human capital is developed because of two reasons as schooling (learning-or-doing) and experience (learning-by-doing). Further Wong (2012) points out that the impact of time lag in the effect of human capital (the time gap between the period of investment for human capital and the result of such human capital). As he convince that primary education will be effective after ten to fifteen years later while tertiary education would be effective after six years later.

As Gazdar et al (1994), Malick (1991), Ahmed (1990) and Kazi (1995) indicate that education plays a critical role in human capital development. But the way how education influences on poverty especially to rural sector by means of human capital development is not extensively focused in this study. But alternatively, the linkage between education and human capital development through the productivity was suggested by Rohana (2006). But again, the way how productivity comes as a result of better education to relate with rural poverty is not clearly indicated. Still as per the brief of the literature review the human capital development which comes as a result of better education have a précises relationship and impact on both poverty and the development of a nation as a long term solution to eradicate the poverty.

However, Chandrakumara (2009), with the definition given by Schultz by incorporating stock of knowledge, skills, abilities in to productivity and employment, indicates that '*human capital is a mean of achieving higher productivity and higher wages for individuals*'. Further what Chandrakumara (2009) and Schultz indicates can be shown below in the Figure 1.1.

Figure 1.1 Means and end of Human Capital

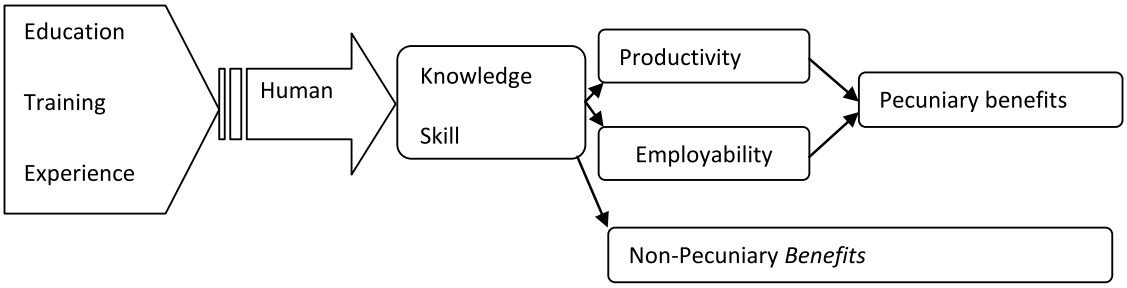


Source: Author Created based on Chandrakumara (2009) and Schultz (1961)

As per Figure 1.1, Chandrakumara (2009) tries to explain that education and training along with health factor can make human capital concept. This is further consistent with what Schultz indicates. Further Chandrakumara (2009) points out that parents are forcing their children to go to school expecting future benefits to their children.

However Chandrakumara (2009) concerns human capital is somewhat relates with what Sen indicates. In brief Sen indicates that capability creates choices and as such choices can stimulate the freedom of people. Chandrakumara (2009:6) indicates those who are having human capital can ' *no longer be at the mercy of other, instead they can be in control of increasing their own productivity and earning through expanded capability'.* What Chandrakumara (2009) articulated and how it was derived from the studies done by Zuluaga (2007) and Schultz (1961) can be illustrated as below in the Figure 1.2.

Figure 1.2 Education and its Pecuniary and Non-Pecuniary Benefits



Source: Author Created based on Chandrakumara (2009), Zuluaga (2007) and Schultz (1961)

Figure 1.2 clearly indicates that human capital is fostered by Education, Training, Experience and etc being the three folds of education as Formal, Informal and Non-Formal education along with health to form KSA (Knowledge, Skills and Abilities) to enhance

Productivity and Capability to bring pecuniary benefits and non-pecuniary benefits of education to individuals as explained above

IV EDUCATION, HUMAN CAPITAL AND CAPABILITY AND POVERTY

As Sen identifies in his book of 'Development as Freedom' he believes that poverty must be seen as the deprivation of basic capabilities rather than merely as the lawness of income which is the standard criterion of identification of poverty. He indicates poverty is not due to income deprivation or insufficiency to make basic needs but insufficiency can be reason for capability deprivation. Sen indicates that income is only instrumentally significant not instrumentally important like functioning or capabilities (Robeyns 2003).

Regarding educational involvement of poverty through capability approach, Sen indicates that *'better basic education and health care improves the quality of life directly; they also increase a person's ability to earn an income and be free of income-poverty as well. The more inclusive of the reach of basic education and healthcare, the more likely it is that even the potentially poor would have a better chance of overcoming poverty'* (p.90). However as Sen indicates that education can be used as a tool to increase income in order to avoid, but Sen does not indicate that education is a type of tool in order to improves ones capability.

As Robeyns (2003) indicates that '*capability*' is something like *freedom to achieve something* which *'functioning'* mean *achievement.* But Sen has not clearly recognized the importance of education on capability enhancement or else the better functioning. As Chandrakumara (2009), Weir (1999) and Zuluaga (2007) indicates that education has 'pecuniary' and 'non-pecuniary' benefits. While 'pecuniary' benefit indicates revenues or income the 'non-pecuniary' benefits indicates other aspects such as attitudinal changes, behavioral changes, changes of thinking patterns and etc. both these benefits can be instrumental in influencing these '*beings and doings'* or functioning.

However in order to achieve such capabilities as shown by the Robeyns (2003), there should be overall human changes which comes from the other non-pecuniary benefits which is flowing from the education.

However Sen's main concern is to focus on inequality and poverty (Robeyns 2003) and as Robeyns (2003) claims that Sens' approach is a normative framework but not a theory. Although the study done by Sen indicated about capabilities, he has not given the list of capabilities then as what are these capabilities that is peoples are potentials to functioning as life and physical health, mental wellbeing, bodily integrity and safety, social relations, political empowerment, education and knowledge, domestic work and non-market care, paid work and other projects, shelter and environment, mobility, leisure activities, time-autonomy, respect and religion. It is the capability list developed by Robeyns (2003). However education can influence indirectly on such life and physical health, mental well beings, bodily integrity and safety, social relations, political empowerment and, respect and religion through its non- pecuniary benefits such as peoples' attitudes, perception, behavioral changes, knowledge. Further education

can even influence directly on domestic work and non-market care, paid work and other projects, shelter and environment, mobility, leisure activities, time-autonomy through its pecuniary benefits such as higher income or wage. Therefore, even Robeyns (2003) also has not recognized that these capability items can be further shaped up by education.

Further even Semasinghe (2009:185) also categories rural people's capability list as food (avoid hunger and food insecurity), education (free from illiteracy and having knowledge), health (having a healthy life), clean drinking water (access adequately to clean drinking water), housing (sheltered safely and adequately) and sanitation (aces to improved sanitation). Although the study done by Semasinghe (2009) has not attempted to measure the capabilities directly, still the study tries to see its achieved functioning. Again education has the ability to influence on; to avoid hunger and food insecurity (through pecuniary benefits), to be free from illiteracy and having knowledge (through non-pecuniary benefits), to have a healthy life (through non-pecuniary benefits), to access adequately to clean drinking water (through pecuniary benefits), to get sheltered safely and adequately (through pecuniary benefits) and finally to get access to improved sanitation (through pecuniary benefits). These all can be achieved through its pecuniary and non-pecuniary benefits which are derived from education.

In case of Sri Lanka, it is country with free education and free health care; that mean education and health capability is there significantly. However even having free education system or full education capability in Sri Lanka, still there is a considerable 'no-schooling' rates, higher schooling drops out rate, higher GCE O/L failing rate, higher GCE A/L failing rate and etc. every sectors such as rural, urban and estate sector. Again even having health capability also in Sri Lanka, still it has health problems. The reasons could be lack of better knowledge, skills, abilities, attitude, perceptions and behavioral changes towards such of which can only be refreshed by the education as in major. Further Clark (2005) develops his conceptual foundation of capability approach as shown below in the figure 1.3

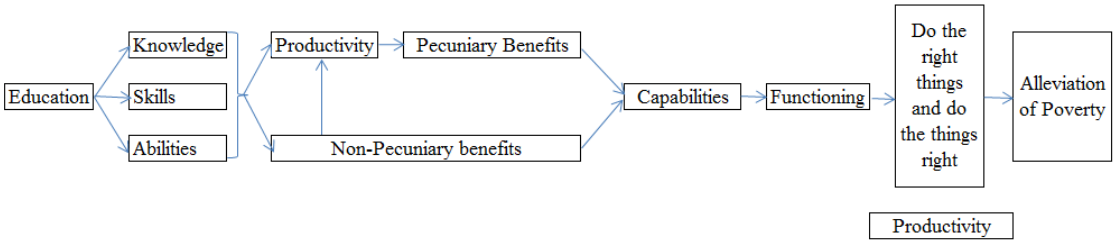
Figure 1.3 Developments of Capability Approach

Source: Conceptual foundation of Clark (2005:3)

As per Figure 1.3, even Clark (2005) also categories that commodity as 'income' or 'commodity to command' as has been articulated by Sen. However income is a function of productivity as most of literature such as Tabari& Reza (2012),Pudasaini (1983)Ekbom (1998), Kalirajan and Shand (1985), Weir (1999) and Pandey and Reddy (2012) reveal. Further as Fuglie (2009), Asadullah&Rahman (2009) point out productivity is a function of education. Therefore it can be concluded that income is a function of education. Then such income has an ability to influence on a persons' capability in order to function properly to satisfy his utility requirement. However to function well in the society also do be done rightly or productively in order to achieve real poverty alleviation.

However in case of capability approach, education has a dual role; as Sen indicates lack of education capability itself poverty headed scenario. On the other hand, education can influence the other capabilities through non-pecuniary benefits and pecuniary benefits to function well in the society to enjoy the real freedom with real poverty alleviation. As Sen indicates that capability deprivation means inability to function in the society; that mean; *inability* to *'being and doing'*. Then the question arises why education can't make this *inability* to *'being and doing'* turn in to *ability* to *'being and doing'.* It can be done using the pecuniary and non-pecuniary benefits of the education as explained earlier. However based on the developments of capability approach, the following illustration can be shown as in the Figure 1.4.

Figure 1.4 Developments of Capability Approach through education



Source: Author created based the studies done by Chandrakumara (2009) Sen, Robeyns (2003), Weir (1999)

As above Figure 1.4, indicates that the Knowledge, Skills and Abilities (KSA) generated form the three folds of education (Formal, Informal and Non-formal) can influence on capabilities (freedom to achieve something) through non-pecuniary benefits (changes of attitude, perception, behaviors, line of thinking) and pecuniary benefits (revenue or earning or wages) which comes through better productivity due to better education has an impact on its functioning (achievement). However, sustainable solution to poverty or long range solution to poverty or real poverty alleviation come only through productivity (do the right things and do the things rightly) as an extended development of education .

However, as Chandrakumara (2009) indicates education foster Human Capital and then Human Capital develop one's productivity in a deeper sense. This indicates that education can make the person to be more efficient *(to decide what is the right way to do a certain thing*) and to be more effective *(to decide what is the right thing to do*). Therefore education has a direct impact on productivity and capability as literature supports. Further many studies points out that poverty income is influenced by the productivity in great. As the current study aims to see the income poverty approach as in major, the productivity is an important aspect of income poverty.

However the difference between Sen and Chandrakumara (2009) is that, Sen did not concern that education or human capital is the starting point of productivity or earning whereas Chandrakumara (2009) says it is; further Sen infer that earning is nothing with poverty, unless income does not assist in forming capability; but Chandrakumara (2009) believes earning as a part of poverty as a mean of poverty alleviation. Further what Chandrakumara (2009) indicate about 'benefit of the income' due to expanded capability or employability and productivity due to human capital is somewhat contrary to Sens' concerns. However Chandrakumara (2009:6) firmly believes that '*the creation of human capital through education among poor greatly helps to reduce or alleviate poverty'.* Further, Chandrakumara (2009) is in a better view that poverty can be reduced through the empowerment of education as initial driver and productivity and employability as the mediating driver to effect on income.

V. SUMMARY

Education makes a person; a resource, a capital or an asset. Education can improves one's thinking ability, creativity and innovativeness. It has the ability to make people to be more proactive rather than reactive. Education can make people; to think broadly rather than narrowly, to work as a team (social capita) but not as a group; to think about present and future simultaneously rather than past and the present; to pursue opportunities facing with threats rather than sacrificing opportunities for threats. In case of agricultural development of any country, education as a source of capital can change farmers' pattern of thinking to; a proactive way rather than reactive way or developmental aspect rather than merely growth aspect. Hence education level of farmers extends its sphere up to input, process and output levels of farming in order to curtail poverty. In case of better selection of agricultural 'inputs' such as seeds, season, pesticides, crops, technology adoption, shifting methods and etc, the education plays a major role. Regarding strengthening the 'process' of farming, use of technology and etc and pertaining to 'output' of the farming, education of farmers would be materially supportive in order enhance their income and standard of living. Therefore the basic objective of this effort is to study the interrelationship

between education and agricultural productivity through human development.

Education as a source of human capital makes the people a resource, hence this resourceful people can make the things productive. Then the productivity emerges with plenty of advantages to agricultural sector and then the rural sector. Primarily, it gives a clear pathway to succeed agricultural sector through; cost advantages, higher income, higher wages, adequate volume of marketable surplus to higher income, enhancement of skills, ability meet the growing agricultural demand of people and so on. Hence agricultural development is a function of higher income, higher income is a function of productivity; productivity is a function of human capital development; human capital development is a function of education. Therefore Agricultural development is a function of education. The human resource reflected by educated farmers has been said to be a very important in determining the effects of agricultural growth on poverty reduction. Being the end result of education to a farmer, the agricultural productivity, it helps to enable farmers to develop rural sector through socially and economically through agricultural growth. Hence the starting point of agricultural growth is the development of education.

Agriculture and rural sector is inseparable; whereas education, productivity and development are also inseparable. Therefore when it turns to agricultural development, there is a correlation between agricultural productivity and education as a source of human capital. While education up to the secondary level of farmer has a significant impact on the improvement of agricultural productivity, the level of education works as source of agricultural transmission or innovation. This innovation along productivity forms the 'input' part of production process, in a meaningful and sustainable way in order to form a strong bond in the agricultural sector to boost their income sources than the poverty line. Therefore, the 'input' being a measure of total factor productivity (TFP) relating output in production gives a superior indicator of a sector's efficiency. Innovation, productivity and efficiency are by-products of education of which should be used as a source to generate income aspects in the rural sector. Not only it boosts the income level due to innovation, but also can enjoy cost advantage too due to farmer's choice of best combination of products.

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