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**COMMUNITY MEDIA TO DIFFUSE SUSTAINABLE ENERGY  
PRODUCTS: PERCEIVED EFFECTIVENESS**

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***Abstract***

The use of sustainable energy in the rural areas is one of the major solutions for the increasing local, national, and global environmental problems. However, to diffuse the use of sustainable energy products among the rural communities, the active communication channel is a key. To the countryside people, community media is the most contextualized, easily accessible, and trustworthy media. The motto of this research is to assess the perception of the rural people of how communications through the community media can change their motivation to use sustainable energy products utilizing theoretical and empirical approaches. A structured questionnaire survey derived from the constructs and items identified through focus group discussion and intensive literature review. The study is done in an underrepresented country (i.e., Bangladesh) in the broader literature on sustainable energy and community media interdisciplinary research. A structural equation modelling technique is applied to test the hypotheses. The values of the reliability and validity of the model are found perfect. This study concludes that the unique characteristics of community media can enhance the acceptance of their sustainable energy promotions to the rural people. This ease to explore the opportunities, improve the levels of abilities and motivation of the rural people, and thus quickly diffuse sustainable energy products in the rural area.

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**Keywords:** Sustainable energy, community media, structural equation modelling, rural area, sustainability communications.



## 1. Introduction

Sustainable energy is the solutions of many local, national, and global economic, social and environmental problems (Berhe et al., 2017). Access to sustainable energy triggers other sustainable development goals, including poverty eradication, improvement in health, education, water supply and industrialisation, and adaptation to climate change effects in the developing countries (United Nations, 2016). For example, community radio, community clinic, mobile-boat school, rural households, religious establishments, irrigation pumps, water treatment plants, and street lights, and even remote railway stations can be operated using sustainable energy, i.e., solar power (Barua, 2017). However, rural people are not technology driven; they need to be taught about the opportunities available to use sustainable energy, the potential economic, health, and environmental benefits (Hossain, Rokonuzzaman, & Hossain-E-Haider, 2015). So, it is needed to change the rural people's attitudes, abilities, and motivations to adopt sustainable energy use and transform to a new lifestyle (Gatersleben et al. 2002).

Research shows that media due to its ability to directly affect public's environmental awareness, knowledge, opinion, and concern (Stamm, Clark & Eblacas 2000), can be a catalyst in this regard (Berhe et al., 2017). However, all kinds of communication and communication channels are not accessible and widely accepted by the rural communities (Chapman et al., 2003). The community media, which is a two-way community communication media (Berrigan, 1979) can be useful in sustainability communications. More specifically, the community radio can be the best tool due to its high level of acceptance among rural community regarding the promotion of sustainability initiatives (Chapman et al., 2003). However, no mentionable research highlights the impact of media on sustainable energy consumption behaviour (Pettie, 2010).

Moreover, the government along with other nongovernment and donor agencies in the study country, (i.e. Bangladesh) is working to diffuse sustainable energy products (Hossain, 2015), but a slower diffusion is realised due to many reasons (Hoque & Das, 2013). However, although research has found that media can be the primary promotional tool in diffusing sustainable energy (Berhe et al. 2017) and community media is also found successful in promoting sustainable behaviours in the rural areas (Basselin & Geertsma, 2017), but it is not adequately being used for communicating sustainable energy products. No mentionable study has been done yet in Bangladesh to investigate the perception of rural people on how much community media can stimulate the adoption of sustainable energy products. Therefore, this study aims to measure the perception of the rural people on how a community media can diffuse sustainable energy products. This research shows that why the policymakers should depend on community media and how to use it to accelerate the diffusion of sustainable energy products. It uncovers the perceptions of the local people about the ability of a community media to change their attitude to sustainable energy and assist to find out opportunities as well as motivate to adopt sustainable energy behaviours.

## 2. Problem Statement

Bangladesh is now a vulnerable country due to the recent effects of climate change. The country can only ensure energy security for its rapidly growing population through enhancing access to sustainable energy (Barua, 2017). In Bangladesh, about 70% people live in the rural areas, and just 42% have access to the national grid (Kabir, Kim & Szulejko, 2017). The country is facing energy shortages due to its

dependency on natural gas (however, reserves are now on the verge of depletion) based power stations (Hoque & Das, 2013). This results in about 1-2% decline in GDP growth annually (Kabir & Uddin, 2015). However, shifting from fossil fuels to sustainable energy can take the nation away from the danger (Hoque & Das, 2013). Bangladesh is endowed with vast renewable energy resources such as biomass and solar insolation that can be used as a primary source of energy in rural areas (Islam, Islam, & Beg, 2008). The potential of biogas technology in Bangladesh is immense as it has substantial cattle and poultry population, as well as the biomass briquetting technology based on rice husk and saw dust due to its agricultural base (Islam, Islam, & Rahman, 2006).

Moreover, this agriculture-based country demands plenty of water for irrigation during the dry season and supported by about 1.42 million diesel-operated irrigation pumps that generate colossal CO<sub>2</sub> and might be replaced by solar irrigation pumps (Hossain, 2015). So, the solar energy has the highest potential in Bangladesh as having the intensity of direct radiation due to 7-10 hours of sunshine over 300 days in a year with average solar radiation up to 6.5 kWh/m<sup>2</sup> per day (Islam et al. 2008; Hossain, 2015; Barua, 2017). Solar power has been found financially viable for rural people based on its comparative costs and benefits compare to other energy sources, as well as it is eco-efficient that bring economy and ecology together toward sustainable development (Chakrabarty & Islam, 2011). The users of sustainable energy in Bangladesh are highly satisfied. Research shows that 85% of respondents in rural areas say that biogas has improved their mental health, physical health, and financial condition, as well as reduced pollutants that may hurt the environment (Islam & Hossein, 2014).

Currently, a few organisations are working to diffuse sustainable energy in Bangladesh. According to Hossain (2015), GIZ, SNV Netherlands Development Organization, the USAID Catalyzing Clean Energy in Bangladesh (CCEB) and the Global Alliance for Clean Cookstoves are working in Improved Cookstoves (ICSs) sector. Infrastructure Development Company Limited (IDCOL) promotes and disseminates the Solar Home System (SHS) in remote rural areas through its Solar Energy Programme with financial support from the World Bank, Global Environment Facility (GEF), KfW Development Bank, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the Asian Development Bank and the Islamic Development Bank (Hossain, 2015). The Institute of Fuel Research and Development (IFRD) of the Bangladesh Council of Scientific and Industrial Research (BCSIR) carrying out different pilot projects on biomass (Hossain, 2015). Also, the government has established sustainable and renewable energy development authority (SREDA), which is also working on sustainable energy in Bangladesh (Barua, 2017). The country is dreaming of providing electricity to all by 2020 by targeting to generate 10% of electricity by that time from renewable sources, so sets a renewable energy policy in 2009 (Hossain et al. 2015). However, the rate of growth of diffusion of sustainable energy products in rural areas is slower than expected due to many reasons (Hoque & Das, 2013) like many other developing countries. These include including lack of the social/community acceptance of renewable energy innovations (adoption decision of local stakeholders, particularly residents and local authorities (Wu<sup>†</sup> stenhagena, Wolsink & Bu<sup>†</sup> rer, 2007).

## **2.1. Defining sustainable energy products**

According to Lemaire (2004), sustainable energy refers to energy that meets the current generation's energy needs, without sacrificing future generation's ability to meet their own energy needs and embodied

renewable energy and energy efficiency. In other words, according to Oxford dictionary, it means energy derived from natural resources that are capable of being replenished. Renewable sources include sunlight, wind, rain, and geothermal heat (Peterson, 2012). These are easily accessible, safe, and available in sufficient quantity that foster continued economic and social development, but keep the environmental stewardship (National Science Foundation, 2009). Sustainable energy products include solar power (e.g. solar irrigation pumps, solar mini-grid, arsenic water treatment plants, solar rooftop, and solar street lights) (Barua, 2017), wind turbine, hydropower (mini hydropower and micro hydropower), biomass (based on cow dung, wood, forest residue, municipal solid waste, and poultry litter, biogas plant), and Geothermal (Hossain, 2015). From energy efficiency perspective, improved cookstoves improved rice parboiling system, and LED lights are also sustainable energy products (Islam et al. 2006). Sustainable energy is not only required for that the stock of fossil fuel is getting the finished but even burning fossil fuels have a devastating impact on the climate (MacKay, 2009).

## **2.2. Factors affecting the adoption of sustainable energy products in the rural areas**

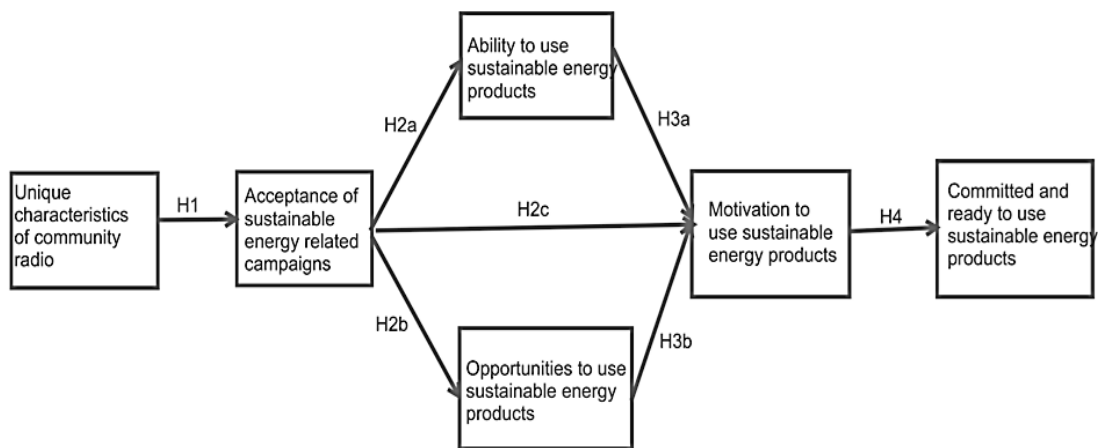
Consumers' adoption process to sustainable energy depends on their understandings of the entire process of consumption (Pettie, 2010). It includes the ability to engage in the behaviour (regarding skills and task knowledge) and the extent to which consumers' situation gives the relevant opportunity to engage in it, as well as an intention to combine consumptions to form a new lifestyle (Gatersleben, Steg & Vlek, 2002). People's motivations (e.g., environmental awareness), their perceived opportunities (e.g., availability of environmentally sound products), and abilities (e.g., income, time pressure, knowledge) are important to perform the sustainable behaviour (Pettie, 2010; Qureshi et al., 2017). These three are the part of MOA model (motivation, opportunity, and ability), which is predominantly used to measure the intention of people about pro-environmental behaviour (Ölander & Thøgersen, 1995). More specifically, ability refers to habit, task knowledge, and skills that needed to perform a particular behaviour (Hughes, 2007). Task knowledge is essential when to adopt a new procedure relevant to sustainable behaviour (Jackson, 2005). Motivation combines the drives, attitudes, wishes, urges or desires to engage in a behaviour (Bayton, 1958). However, people can be personally motivated based on the personal realisation that the change will bring some benefits) and socially motivated based on others' priority in own choice that can make them ready and committed to involving in sustainability (Fisher & Fisher, 1992). Opportunity is a kind of preconditions or facilitator or external conditions, and if enhanced, the chance of being involved in a new type of behaviour is increased (Ölander & Thøgersen, 1995; Jackson, 2005).

According to Peattie (2010) for pro-environmental behaviours, change in the values and beliefs, the perception of the environmental problems, concern and obligations, sense of responsibility to act, the degree of involvement and conscious decision making are important. Through disseminating the knowledge and best practices and advocating as well as educating the rural people this could happen (AGA Agenda, 2012). However, media can play an essential role in this regard (Haron, Paim & Yahaya, 2005). It can directly affect public's environmental awareness, knowledge, opinion, and concern (Stamm et al., 2000). Media is also a key to quickly creating a different and technology-oriented consumer culture (Michaelis, 2001) However, the impact of media on sustainable consumer behaviour is underrepresented in the broader literature (Pettie, 2010).

All kinds of communication are not useful in sustainability communications. Instead, a two-way interactive, participatory, and beneficiary oriented communication (Mefalopulos, 2008) which is consistent with the specific situation and context (UNEP, 2005). An effective sustainability communication can increase rural people’s knowledge and skills or abilities (Sood et al., 2004) through education and conversations or dialogues between the suffering communities and the benefactors, thus can change the rural communities’ attitude and increase levels of motivation (Godemann & Michelsen, 2011) to explore and use opportunities towards sustainable practices (Kruse, Renneberg & Adams, 2011). Moreover, all medium of communications may not be fruitful in this aspect (Mefalopulos, 2008). However, the alternative media- the community media or the two-way community communication media (Berrigan, 1979) can be a catalyst in the rural area for sustainability communications (Henning, Louw & Dbsa, 1996). In this media, people can simultaneously acquire knowledge and exchange own views of procedures or new systems (Berrigan, 1979). However, radio is the most effective among the community media (i.e., video, TV, online, radio, theatre, newspaper, magazine, and outdoor) due to its extensive reach, trustworthiness and authenticity, as well as it is more human, community-focused, and interactive (GFK, 2017)

### 3. Research Questions

The current scenario of Bangladesh regarding sustainable energy use is not satisfactory, although its position is better than many other countries. Lack of promotion is a significant drawback to get rural people engaged with sustainable energy products’ use. Now the questions are: What kind of media can contribute to the diffusion of sustainable energy products in the rural areas? Why would people like that media and accept its communications? What are the determinants to the rural people to adopt sustainable energy products? How do community radios can affect those determinants? However, the answers of these questions are based on the conception that the community media (i.e. community radios) has already become a proven tool in Bangladesh to promote many sustainable initiatives in the rural areas, due to its high level of acceptance. So, community radios can also increase awareness and knowledge on sustainable energy products, guide rural people on exploring opportunities to use sustainable energy products, motivate the rural people, and thus make the rural people ready and committed to using sustainable energy products. Based on these research questions the following hypothesised model is proposed and the hypotheses are to be tested based on the empirical findings:



**Figure 01.** The hypothesized model

H1: The unique characteristics of community radio can affect the acceptance of sustainable energy-related message

H2a: If people accept the sustainable energy-related contents aired by community radio it can enhance their ability (e.g., skills, knowledge) regarding the adoption of sustainable energy products

H2b: If people accept the sustainable energy-related contents aired by community radio it can guide them to explore the opportunities regarding the adoption of sustainable energy products

H2c: If people accept the sustainable energy-related contents aired by community radio it can motivate them to adopt sustainable energy products' use

H3a: If people have the ability their motivation is enhanced to adopt sustainable energy products' use

H3b: If people get the opportunity their motivation is enhanced to adopt sustainable energy products' use

H4: If people are highly motivated they become committed and ready to use sustainable energy products.

#### **4. Purpose of the Study**

The purpose of the study was to assess the perception of the rural people on how a community media can diffuse sustainable energy products. This research was particularly intended to: define sustainable energy and its sources; explain the penetration of sustainable energy products and the roles of community media in Bangladesh; identify an appropriate theory to uncover the understandings of the perception of sustainable energy adoption of the rural people; explain a model, including community media and the determinants of sustainable energy adoption.

#### **5. Research Methods**

As the purpose of the study was to explain the perception of the impact of community media on diffusing sustainable energy through sustainability communications based on a theoretical framework, so the researcher uses an explanatory research methodology. This kind of research explains structured relationships or causal effects among variables (Saunders, Lewis & Thornhill, 2009). A focus group discussion of the community radio listeners, who are graduated from a college and currently using sustainable energy products, is done to identify the constructs. The focus group identifies the constructs with items to measure (i.e. unique characteristics of community radios, acceptance of sustainably communications, ability to use sustainable energy, opportunities available to use sustainable energy, motivation to use sustainable energy, and commitment to engage in the use of sustainable energy products). Then based on these constructs the hypotheses are developed. Following this, a survey is designed as it is useful and trendy to study human behaviour (Bhattacharjee, 2012). Twelve Master's students of a public university who have completed a course on Marketing Research and prior survey experience worked as surveyors. They are chosen based on their familiarity with the study area. They are also taken through a two hours interactive class on the structured interview survey, which is better than a self-administered

survey (Alshenqeeti, 2014), when the respondents belong to mixed groups regarding education for example, in the rural area of Bangladesh.

The survey is conducted in October 2017 within the ten-kilometre radius of the six community stations out of the total 17 CR stations in six districts that face a considerable electricity shortage in Bangladesh. The surveyors meet one adult person from each of 400 households visited in the villages randomly and survey 310 respondents who agree to provide their address, phone number, and signature on the script as well as allow their voices to be recorded using a mobile phone recorder. The surveyors pronounce the questions and answers before them and mark the responses as suggested by the respondents and record the interview. After the survey, the researcher contacts the respondents and verify whether they have been surveyed. The first part of the questionnaire presents some basic listenership questions, however the second part presents the constructs-based items identified by the focus group. The questionnaire is composed using Bengali (the native language of Bangladesh). The answers to the questions are measured using a Likert scale, which is widely used in the social science discipline (Gliem & Gliem, 2003). A five-point scale (ranged from 1 = strongly disagree to 5 = strongly agree and 3 = neutral point) is used to measure the responses (see Table 01).

**Table 01.** The question items and constructs used in the research

	<b>Questions regarding the characteristics of CRs and sustainability communications aired by the CRs in Bangladesh</b>	<b>Scale: 1 = Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, and 5 = Strongly agree.</b>
Question Codes	Questions	Name of constructs
uc_1	As a rural media people like community radio because it is managed by a community itself	Unique characteristics of community radio
uc_2	Rural people prefer community radio to commercial media because its programs are based on participatory communication basis	
uc_3	Rural people like community radio more than any other media as it airs programs on local development	
uc_4	As a rural media people love community radio because it gives the needed information in convenient way	
uc_5	Rural people love community radio because it provides jobs in the media sector	
uc_6	Rural people like community radio because it has great entertainment ability	
acp_1	Rural people may accept community radio's commutations on the advantage of sustainable energy products that can connect them with the modern communication and technology world	Acceptance of sustainable energy-related contents
acp_2	Rural people may accept community radio's commutations on the advantage of sustainable energy products that can be used in their household's efficiency	
acp_3	Rural people may accept community radio's commutations on the advantage of sustainable energy products that can be used for their farm's efficiency	
acp_4	Rural people may accept community radio's commutations on the advantage of sustainable energy products that can be used for their small businesses' efficiency	
opr_1	I think community radio can guide people on exploring the opportunities to use sustainable energy to connect with modern communication and technology world	Opportunity to use sustainable energy products
opr_2	I think community radio can guide people on exploring the opportunities to use sustainable energy products for household's use	
opr_3	I think community radio can guide people on exploring the opportunities to use sustainable energy products for agricultural use	
opr_4	I think community radio can guide people on exploring the opportunities to use sustainable energy products for small businesses	
abl_1	I don't think community radio can increase skills and knowledge to use sustainable energy to connect people with modern communication and technology world	Ability to use sustainable energy products

abl_2	I think community radio can increase knowledge and skills to use sustainable energy products for household's use	
abl_3	I think community radio can increase knowledge and skills to use sustainable energy products for small business use	
abl_4	I think community radio can enhance knowledge and skills to use sustainable energy products for household's use	
mtv_1	I think community radio can motivate the rural people to use sustainable energy products to be connected with modern communication and technology world.	Motivation to use sustainable energy products
mtv_2	I don't think community radio can motivate the rural people to use sustainable energy products in their houses	
mtv_3	I think community radio can motivate the rural people to use sustainable energy products in their agricultural production	
mtv_4	I think community radio can motivate the rural people to use sustainable energy products in their small businesses	
cmr_1	If community radio can motivate rural people about the use of sustainable energy products, they can be committed and ready to adopt it to be connected with the modern world	Committed and ready to use sustainable energy products
cmr_2	If community radio can motivate rural people about the use of sustainable energy products, they can be committed and ready to adopt it for their household use	
cmr_3	If community radio can motivate rural people about the use of sustainable energy products, they can be committed and ready to adopt it quickly for their agricultural use	
cmr_4	If community radio can motivate rural people about the use of sustainable energy products, they can be committed and ready to adopt it quickly for their small business use	

After collecting the data, 10 questionnaires are found with some missing values and therefore not used for statistical analysis. Scale reliability is tested before exploratory and confirmatory factor analysis. The hypotheses are tested based on the results of the path analysis using partial least square structural equation modelling approach, which is a prevalent technique (Hooper, Coughlan & Mullen, 2008) even for nonexperimental research in social science research (Alshenqeti, 2014). SmartPLS 2.0 is used to analyse the model's reliability, validity, and structural relationships among the constructs.

## 6. Findings

From the scale reliability test, two items (i.e., uc\_5 and uc\_6) (see Table 01) are found with very low squared multiple correlations (i.e. .094 and .104 respectively) along with insignificant negative values for corrected item-total correlation. Also, it is found that after deleting those items the value of Cronbach's alpha of the data is increased. Moreover, the exploratory factor analysis shows that these two items are not significantly correlated with any other items in the matrix, therefore, removed. However, after removing them, the results of exploratory factor analysis show excellent Goodness-of-fit with the six factors (i.e., Chi-Square 114.085, df-147, and Sig .980), which according to Hooper et al. (2008) is sound for confirmatory factor analysis and path analysis using structural equation modelling (Kline, 2011). This finding says that the rural people trust and accept community radio neither because of its entertainment ability nor its ability to provide voluntary jobs rather than its ability to contribute to development. This, in turn, indicates that community radio is a trustworthy medium for sustainability communications and people also like to see it from this perspective more than its music or entertainment appeal. Therefore, both the commercial and non-commercial organisations can use community radio to promote sustainable energy products as those goods are approached to rural people for their sustainable development.

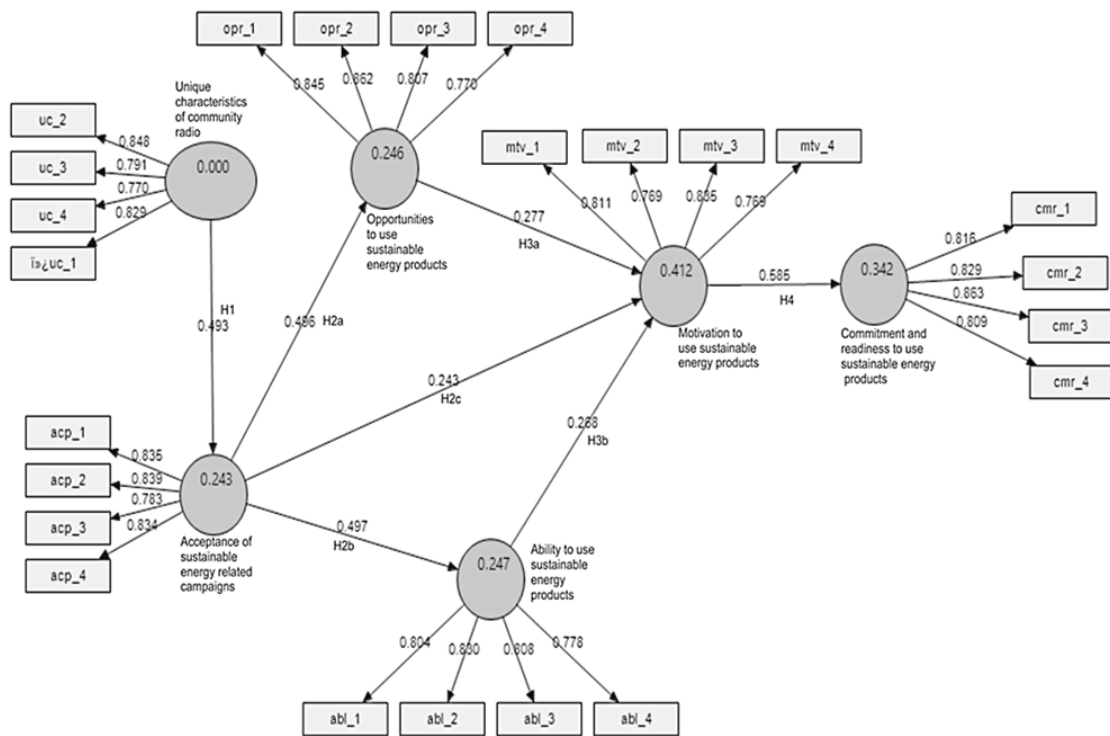
As the responses of the variables are based on the respondent's perception so common method bias test is done. According to the single-factor extraction test the first factor doesn't exceed the majority of the



total variance (i.e. explains only 21% of variance) and the values of variance inflation factor are  $<10$  (i.e. the highest one is 3.05) (Hair et al., 2011). Moreover, other indicators of reliability and validity based on the partial least square test are highly satisfactory (see Table 02 for the detail of the results). The Chronbach's alpha values of each of the six constructs are  $> .80$ , which tells that the responses are very consistent across items within the measure (135). R2 values of all the items and constructs are at 0.5 threshold, which shows good structural relationships among the items within and between the constructs (Hair et al., 2011). The discriminant validity of the data is ensured based on the values of correlations between the constructs are neither too high ( $\geq .90$ ) nor too low (Kline, 2011), whereas between .77 and .86 with low cross-loadings (Henseler, Ringle & Sarstedt, 2015), i.e., .3. The data also ensures the convergent validity, as the values of average variance extracted is found  $> 0.50$ . (Hair, Ringle & Sarstedt, 2013). The values of the composite reliability or construct reliability is also  $> .80$ , which according to structural equation modelling researchers is excellent (Hair et al., 2012).

**Table 02.** Results of the structural equation modelling analysis

Total respondents (N)= 300	Constructs											
Particulars	Ability to use sustainable energy products		Acceptance of sustainable energy-related contents		Commitment and readiness to use sustainable energy products		Motivation to use sustainable energy products		Unique characteristics of community radio		Opportunity to use sustainable energy products	
Loadings	abl_1	0.804051	acp_1	0.834700	cmr_1	0.815597	mtv_1	0.810906	uc_1	0.848026	opr_1	0.845296
	abl_2	0.830361	acp_2	0.838863	cmr_2	0.829066	mtv_2	0.768734	uc_3	0.791486	opr_2	0.862016
	abl_3	0.807600	acp_3	0.783416	cmr_3	0.862831	mtv_3	0.835309	uc_4	0.770132	opr_3	0.806612
	abl_4	0.777550	acp_4	0.834057	cmr_4	0.809173	mtv_4	0.768833	uc_1	0.829099	opr_4	0.770140
Average variance extracted (AVE)	0.648200		0.677452		0.687947		0.634342		0.656527		0.675334	
Composite Reliability	0.880470		0.893558		0.898093		0.873901		0.884190		0.892528	
Cronbach's Alpha	0.818912		0.841120		0.848699		0.807318		0.825279		0.839651	
R Square	0.247162		0.242585		0.342216		0.411547		-		0.246285	
Constructs to constructs effects/path results												
Ability to use sustainable energy products					0.156767		0.267981					
Acceptance of sustainable energy-related contents	0.497154				0.300598		Total= 0.513849 (.267 +.276); Direct= 0.243					
Commitment and readiness to use sustainable energy products												
Motivation to use sustainable energy products					0.584992							
Opportunity to use sustainable energy products			0.496271		0.161951		0.276842		0.244428			
Unique characteristics of community radio	0.244863		0.492529		0.148053		0.253086					



**Figure 02.** The final model with the results of path analysis

The R square values (between .24 and .41) from the path analysis (see Table 02 for values and Figure 02 for the final path model) shows good structural relationships (Hair et al., 2014) among unique characteristics of community radio, acceptance of sustainable energy-related contents, ability to use sustainable energy products, opportunity to use sustainable energy products, motivation to use sustainable energy products, and commitment or readiness to use sustainable energy products. It has found that the respondents perceive the unique characteristics of community radio may have substantial effects (.492) (Kline, 2011) on rural people’s acceptance of sustainable energy-related contents aired by the community radios. This is in line with some past researches that investigated community radio’s acceptance among the rural people regarding sustainability communications (Chapman et al., 2003). People usually accept a communication when they trust the sources and found their real benefits in the communication, and that community radios find out a community’s problems and involve multiple communications to solve the problems, thus meet the listener’ expectations (Al-Hassan, 2011). Community radios particularly address critical issues in sustainable development through communications (UNESCO, 2014) So, the first hypothesis (H1) that the unique characteristics of community radio have positive effects on the rural people’s acceptance of sustainable energy-related contents is found valid.

Moreover, when people accept the sustainability communications, they listen to them carefully. As community radio uses an innovative style of presentation that combines music, drama, dialogue (Chapman et al., 2003) can quickly train the audience through voices. For example, in Bangladesh, it is found that the rural people who did not know about cumin cultivation, but after a program aired via a community radio station, the local farmers' skills have been improved and started farming, instead of keeping their lands idle (Rasheed, 2012) So, it can claim that through the use of local language, local way of speaking, and combining information with entertainment, community radios can enhance people’s skills,

thus H2a (if people accept the sustainable energy-related contents aired by community radios it can strengthen their ability, i.e. skills, knowledge regarding the adoption of sustainable energy products) is accepted. Moreover, the effects are very significant (0.497) (Kline, 2011).

The next hypothesis (H2b- if people accept the sustainable energy-related contents aired by community radios it can guide them to explore the opportunities regarding the adoption of sustainable energy products) is also found true (.496- substantial effects). This means that community radios can guide the rural people to explore the opportunities regarding how to find good products, how to install, and where to install (i.e., households, farm, and small businesses) and use sustainable energy products. For instance, it is found that in an African country, where people were struggling to farm and some of them were migrating to other villages due to lack of opportunities for employment. However, a community radio program based on a development agency guide them on how to be united, clean the river banks, get access to fresh water, and start irrigations and fishing (Ouattara & Ouattara, 2006). Moreover, in Bangladesh, it is found that after a natural disaster when people are not getting opportunities for employment, community radios guide them to explore alternative earnings (Saroar & Routray, 2010).

Similarly, H2c (direct effect - .243) is also true that if people accept the sustainable energy-related contents aired by community radio, it can directly motivate them moderately to adopt sustainable energy products' use. However, the effects of communications on motivation is less than its effects on ability and opportunity. This is because motivation is derived from ability and opportunity. If the community people have skills (.267) and they have opportunities (.276) to use sustainable energy, they are moderately motivated to adopt sustainable energy products. However, if they have both skills and opportunities, they are substantially motivated (i.e., total effects: 0.514). Thus, H3a and H3b are also true. Moreover, when people are substantially motivated, they may become strongly committed and ready (i.e., excellent direct effects: 0.585) to adopt sustainable energy products. So, the last hypothesis (H4) is well accepted. These findings, are in line with the previous researches that investigated the community radio's influence on the rural peoples' motivation and commitment to involving in sustainable practices. For example, two radios in Bangladesh (Radio Nalta and Sagorgiri) have changed the attitudes and levels of skills to implement community-based adaptation to minimising health risks and preventing associated climate change effects using edutainment (i.e., folk song and drama in local languages) (Shumake-Guillemot, 2014).

Another radio (i.e., Mukti,) has motivated people to keep away from human-made disaster for river erosion and build capacity for sustainable fishing (Morshed, 2017). Also, a research has found that over 75% listeners of 'Radio Nalta' in Satkhira district say that due to community radios' innovative programmes they are now well informed about the temperature rise, soil fertility, river erosion, and increased salinity in the locality, so they are changing their behaviours gradually to protect the environmental assets (Rasheed 2012). Moreover, another research has found that due to the disasters and salinity many farmers keep their lands idle, but after the broadcasting of the government representatives' communications and local successful farmers' discussions via community radio (Krishi Radio), people have learnt about the particular process of salinity preventive rice cultivation (Basselin et al., 2017). So, a lot of evidence found that community radio is a successful media that can change people's attitude, ability, and motivate to adopt sustainable behaviors that are required due to the climate change. Community radios also train and educate rural people for employment, good health, and sustainable lifestyle.

## 7. Conclusion

The research has found that the community radio listeners believe that community radios can be utilised to promote sustainable energy products that would be very beneficial to a developing country like Bangladesh. The rural people perceive that through the participatory communication via community radio, the relevant skills and knowledge regarding various usages of sustainable energy can be transmitted. Also, this can assist to identify quality products and use and install sustainable energy products to build their capacity to harvest substantial opportunities. Thus, community radio can change attitude and ability of the rural people and motivate them to be united for diffusing more sustainable energy products. This way, more and more people would be committed to using sustainable energy products to be connected with the modern worlds, for example, using solar based radio and television or mobile phone. People would use the solar pump for irrigation and LED light at homes and small businesses. However, it is essential for the policymakers to think that any advertisement, educational program, dialogue, and talk show aimed at promoting sustainable energy products must be based on the participatory communication basis. The community members should be given priority to come to the radio stations to discuss their sustainable energy needs with the government and nongovernment organisations and jointly identify sustainable energy products that can best meet the rural people's demands. Community radios then can share the real social, economic, environmental, and cultural benefits of sustainable energy through relaying the interviews of the current sustainable energy product users.

These findings of the research are based only on the perception of people of a specific area of a developing country. The sample is only 300, who are the community radio listeners but might not be the user of sustainable energy products. However, in future using a large sample the model can be tested. More importantly, an experiment, including a particular campaign on sustainable energy via a community radio can be aired, and the change in attitude, ability, motivation, and adoption or purchase rate of sustainable energy products of the villagers can be measured. This could evaluate the effectiveness of community radio in diffusing sustainable energy products practically.

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