Mobilizing young people as climate-smart agriculture infomediaries: What do we know?

Working Paper No. 158

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

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Photos:

Abstract

While efforts to adapt to the impacts of climate change have generally increased, the impression is that there is a negligible effort to include the vulnerable areas in the agenda. This paper seeks to fill in the gap by presenting an agricultural extension mechanism to tap high school students as information providers of climate-smart rice agriculture information in their rice-farming communities. This paper looks at the characteristics of the high school students who served as infomediaries as well as their information sources and perceptions on climate change; the best teaching media that can be used; and the infomediation pathways that can be drawn from this initiative. Two survey rounds, 2014 (n=) and 2015(n=), were used as data sources. Focus group discussions and interviews were also conducted. Chi-square tests were also employed. Data show that females are more likely to be infomediaries than males. Schools serve as the primary sources of information on climate change, and students generally equate climate change to extreme weather events such as drought. Various teaching media explored seem to be useful in various development contexts. Teachers are seen as the champions of this initiative. Hence, this initiative rests heavily on the extent of capacity enhancement that can be extended to the teachers so they are in a better position to train their students in the future.

Keywords

Infomediaries, climate-smart agriculture, teaching climate change, climate change adaptation

About the authors

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Contents

Acronyms

APNHS	Agusan Pequeño National High School
BAIHS	Bagumbayan Agro-Industrial High School
CNAHS	Cateel National Agricultural High School
DepEd	Department of Education
DNHS	Dingle National High School
JRS	Jones Rural School
MAIHS	Mapanas Agro-Industrial High School
PhilRice	Philippine Rice Research Institute
SJNAIHS	San Jose National Agricultural and Industrial High School

Introduction

The agriculture sector is among the most vulnerable sectors when it comes to climate change adaptation (Lasco et al., 2015). There is massive evidence on the far-ranging impacts of climate change on agriculture such as increased prevalence of pests and diseases, significant yield reduction, and heat stress among animals (Thornton et al., 2008; Comiso et al., 2014). In the Philippines, this data is most relevant as agriculture remains the major driver of the economy and that there are more than 2 million households who are dependent on rice farming. In the past, massive rice yield loss was documented owing to the El Niño episode (Tacio, 2014), which prompted the country to increase its level of imports. Farmers and fisherfolks remain as the poorest sectors of the Philippine population (NSCB, 2014).

While there has been a sharp increase in the climate change adaptation reports, particularly in the grey literature, the general impression is that there is a negligible effort to include the most vulnerable populations (Ford et al., 2014). It is known that access to climate information (Di Falco et al. 2011; Roco et al., 2014) and extension (Di Falco et al., 2011; Truelove et al., 2015; Gbetibouo, 2009) is positively linked to adaptation. This is something that may be absent in most rural and remote communities in the Philippines. Being the world's second largest archipelago coupled with challenging terrains makes it difficult even for the most well-intentioned agricultural extension workers or those tasked to deliver advances in agriculture to farmers to visit these areas. Hence, there is a need to come up with creative ways on how to address this "adaptation deficit" (Ford et al., 2014) in these remote rice-farming communities in the Philippines. Adaptation deficit is simply the gap in understanding what works best when it comes to climate change adaptation (Ford et al., 2014).

In this paper, the experiences in mobilizing young people to serve as infomediaries for CSA under the Infomediary Campaign will be discussed. A short background about the Campaign is provided in the next section. The data sources from the action research conducted span 2 years of youth engagement to serve as CSA infomediaries. This design has allowed the authors to carefully investigate this matter especially that one of the main activities of the campaign is the integration of CSA lessons in the curriculum of the participating schools.

This paper seeks to explore the idea of mobilizing young people for climate-smart agriculture. Specifically, it aims to ask how young people can be mobilized to serve as infomediaries (information providers) on CSA. The specific objectives of this paper are to: (1) show that young people can be mobilized as infomediaries on CSA; (2) characterize young people according to their knowledge, perception, and sources of information on climate change; (3) identify teaching media that can be effectively used in teaching about CSA to students; and (4) discuss infomediation pathways on CSA that can be drawn from this initiative.

The Infomediary Campaign

Conceived in 2012, the Infomediary Campaign is PhilRice's initiative to engage the youth in agriculture. It is being implemented in 108 high schools in collaboration with the Technical-Vocational Unit of the Department of Education. The key concept is to mobilize high school students to serve as information providers in their remote-rice farming communities (Manalo et al., 2013). The argument for this is while it is difficult to visit the individual houses of farmers especially those who live in geographically disadvantageous areas, their children converge in schools. Hence, the school can serve as the nucleus of agricultural science.

The Campaign has three main components: Read, Surf, and Text. The Read component covers the printed publication needs of the schools. Most of these high schools do not have comprehensive resources on rice. Hence, PhilRice, being the lead agency in rice science and development in the Philippines, is in the best position to provide these reading materials. Also, many of the participating schools do not have electricity in their areas. Hence, the reading component is among the very few strategies that will work in conveying agricultural information in these communities.

The Surf component introduces the students to the PinoyRice developed by the Open Academy for Philippine Agriculture. PinoyRice (www.pinoyrice.com) is an information portal that contains plenty of information on rice farming in the Philippines. It has downloadables such as learning modules, powerpoint presentations, and technology videos. All of these are free for downloading. Considering that many of the participating schools are located in remote communities, most of them comprise the so-called bottom of the pyramid, an offline version is available. This way, the students do not have to access the Internet to use PinoyRice. All they need is the CD with the whole portal in it, and from there they can do the

searching. The Text component introduces the students to the PhilRice Text Center (PTC), also developed by OpAPA. PTC is an SMS platform that caters to all queries on rice farming in the Philippines. There are Text Center agents who respond to the queries.

Aside from the key components, the Campaign also has its main activities. They are the Infomediary Quiz Bee and FaceOff, putting up of rice garden managed by the students, and the regular monitoring and evaluation activities. The Infomediary Quiz Bee and Face Off are edutainment (education and entertainment) mechanisms of the Campaign to gauge the knowledge of the students on rice and rice-based farming systems and to assess their credibility as infomediaries. The students answer three sets of questions in the quiz bee, which are comprised of multiple choices, identification, and practical questions. The idea is to present farming in the most engaging way possible. This method, education and entertainment) is strongly supported in the literature on engaging young people in development initiatives (Whiting, 2009). The Faceoff Round is the last part of the Quiz Bee where farmers in the community are invited to ask questions to the students. The students do not have to know the answer to the questions. They just need to know how to find the answers from the PinoyRice.

A laptop is provided during this round. After which, the farmers answer a 5-question survey, the Credibility Index, that basically revolves around the credibility of the students as infomediaries. The principle behind the FaceOff Round is to address concerns relating to the apprehension of the parents to support their children to be engaged in agriculture-related tasks (Punch & Sugden, 2012; Manalo & Van De Fliert, 2014). Additionally, the thought that farmers will doubt what the students will say has always been present considering that they have been farming all their lives.

The rice garden aims to give the students some hands-on experience in growing rice. This will also help them gain more confidence when they talk about advances in rice farming to their parents. It has been reported that children learn best or are more productive when they are actively engaged rather than being mere receivers of information (UK STC, 2007).

Since 2014, the Campaign has shifted its focus to climate-smart agriculture with the CGIAR Research on Climate Change, Agriculture, and Food Security (CGIAR CCAFS) as its main partner together with the Philippines' Department of Education (DepEd). Under this framework, the same activities and key components are being implemented with a few

modifications and additions. Among the modifications is the focus on CSA in the Infomediary Quiz Bee questions. The poster-and film-making contests are among the additions.

Under the auspices of this project, participating schools were given three CSA modules and teaching guides. They are on Climate Change 101, Climate Change Mitigation Strategies, and Climate Change Adaptation Strategies. All three modules are in Filipino.

Climate Change 101 contains basic information on the science of climate change and its impact on rice production. The aim for this module is to highlight the science and so avoid communicating fear among students. It is known that fear does not motivate action when it comes to climate change adaptation (IPCC, 2007). Climate Change Mitigation module contains the different ways by which people contribute to worsening the phenomenon and the ways by which contributions to lessen climate change impact can be made possible. The PalayCheck System, which is an integrated crop management system and PhilRice's banner program for favorable ecosystems, is extensively discussed in this module. The Climate Change Adaptation module contains strategies for rice farmers to adapt to the impacts of climate change. Palayamanan or rice-based farming systems, which is PhilRice's banner program for unfavorable ecosystems, is extensively discussed in this module.

The Teaching guide serves more like a script for the teachers. This is a necessary intervention to assist the teachers in more effectively teaching this subject matter especially that materials on climate change and rice production are not always adequate.

Methodology

A. Data sources

This paper has two main data sources: the 2014 and 2015 surveys conducted under the project. The 2014 survey was conducted (n=388) in 8 participating schools (Table 1). All students directly engaged in the Campaign, about 50 per school, were surveyed. Crops production majors comprised the majority (52.3%) of the respondents. Likewise, 67.5% of the respondents were females. Most of the respondents were from Grades 8-10 and 13-18 years old. Lastly, 56% of the respondents came from non-rice farming households. Data from the 2014 survey are used in establishing the profiles of the infomediaries and in responding to the objective concerning the teaching media that can be used in teaching CSA.

Table 1. Schools surveyed.

2014 survey participants	Province	2015 survey participants	Province	Engaged since
Ilocos Norte Agricultural College (INAC)	Ilocos Norte	Northern Antique Vocational School	Antique	2015
Balagtas National Agricultural High School (BNAHS)	Bulacan	Cateel Agricultural High School	Davao Oriental	2014
Libon Agro-Industrial High School (LAIHS)	Albay	Bukidnon National School of Home Industries	Bukidnon	2015
Southern Samar National Comprehensive High School (SSNCHS)	Eastern Samar	Ricardo D. Canlas Agriltural School	Nueva Ecija	2014
Malalag National High School (MNHS)	Sarangani	Leyte Agro Industrial School	Leyte	2014
Cateel National Agricultural High School (CNAHS)	Davao Oriental	San Jose National Agricultural Industrial High School	Occidental Mindoro	2014
Dingle National High School (DNHS)	Iloilo	Bagumbayan Agro-Industrial High School	Davao Oriental	2014
Agusan Pequeño National High School (APNHS)	Agusan del Sur	Jones Rural School	Isabela	2015
		Mapanas Agro-Industrial High School	Northern Samar	2015

The 2015 survey (n=482) was conducted in 9 randomly selected schools from the 108 participating high schools nationwide. Five of the 9 schools were those closely engaged in 20141 while the other 4 were engaged closely in 20152. The purpose of dividing the 9 schools into two (2014 and 2015 sites) is to establish points of comparison for some areas of interest such as on the perception of the students on climate change especially how it impacts on rice production and the information sources of the respondents on climate change. This is important as this would inform the strategies that are worth pursuing. Age range of the respondents is 13-16 years old. Respondents were 274 males and 208 females. Most of the respondents were in grade 9 and above (385). The students were taking crop production (266), horticulture (151), and other courses (52). Additionally, 71% of the respondents fall under the

[1] For brevity, sites closely engaged in 2014 will be referred to, from hereon, as 2014 sites

[2] For brevity, sites that will be closely engaged in 2015 will be referred to, from hereon, as 2015 sites

13-15 age range. Data from the 2015 survey are used in answering the questions relating to the perception, knowledge, and sources of information on climate change of the students.

B. Research participants and respondents and the research sites

Overall, 870 students participated in the surveys. Their characteristics were laid down in the previous section. Some more details are provided in Table 1. For the qualitative method, basically focus group discussions (FGD), research participants were the teachers trained by the Campaign, TecVoc unit heads, and the school principal in each school. The communities surrounding the research sites are all agricultural with rice as the main crop. Vegetables and some fruit-bearing trees are grown in most of the sites. Most of them are far from the main road and therefore have some accessibility issues.

C. Methods

This paper utilizes data from a mix of qualitative (FGDs, in-depth interviews, participant observation) and quantitative (survey) methods. Details of the surveys were provided in the previous section. For the FGDs, discussions revolved around issues and strategies in campaign implementation. There were 17 FGDs conducted, 1 each per school. In-depth interviews were conducted with some of the participating teachers to investigate on the innovations that they did in implementing the project. A case study drawn from the in-depth interviews and FGDs is presented towards the end of this paper.

D. Data analysis

Descriptive analyses were done with the survey data. Chi-square and t-tests were employed to make sense of the data gathered. Data are presented in tables and in frequencies and percentages. For the qualitatively derived data, thematic analysis was employed. The data are presented in tables.

Results and Discussion

A. The CSA infomediaries

Using data from the 2014 survey, this section will characterize the CSA infomediaries. Searching for information by reading publications, sending SMS to the PTC, or surfing through the PinoyRice and sharing them with the farmers in their community are the manifestations of being an infomediary.

Chi-square tests were employed (Table 2). Being an infomediary is gender bias. Females ($p=0.071$) are more likely to share than males, although the margin of difference was not well pronounced. This can mean several things but among the more important points are creating avenues to optimize the infomediary potential of female high school students. The second point is to create platforms by which the potentials of both genders can be optimized. Non-crop production majors are also more likely to share information than crop production majors ($p=0.052$). This is something that is worthy of further investigation, but in the literature, among farmers engaged in Farmers Field School in Iloilo, Philippines, sharing was not obvious (Rola et al., 2002). To some extent, learning was kept to themselves. This somehow relates to the finding as those who are supposed to be more interested with the subject matter and are therefore expected to share their learnings did not always function as infomediaries.

Land ownership does not seem to affect the proclivity of young people to become infomediaries. Hence, this means that their being an infomediary is not at all affected by their land ownership status. When students share CSA information, they then become one of the important players in the climate change adaptation chain. Lastly, being a CSA infomediary does not seem to be affected by the familial background of the students. This means that act of sharing is possible regardless of the livelihood source of their families. A critical reading of this finding would suggest that perhaps the act of sharing CSA information remains relevant to the students as they came from rice-farming communities even as their own household does not heavily rely on farming. At some point the students are a part of a bigger community, and hence, household-centric analysis may sometimes not be very useful. This then is consistent with Amartya Sen's Capability Approach, which says that people will value something that they have a reason to value (Grunfeld, 2007).

Table 2. Characteristics of the infomediaries.

Variables	Chi-square test result *(p)*	Remarks
Gender and the act of sharing	0.071	Females are more likely to share than males
Area of specialization and the act of sharing	0.052	Non-crops are more likely to share than crops major
Land ownership and act of sharing	0.430	Land ownership is not associated with the act of sharing
Familial background (rice farming or non-rice farming)	0.052	Act of sharing is possible regardless of the livelihood source of the students

For this part, the information provided above is very useful in coming up with CSA interventions involving schooled young people. This can lead to strategic positioning of interventions as opposed to devising strategies not directed at any group or causes. This is useful in crafting messages, activity designs, and the whole communication strategy itself to optimize impact of mobilizing young people to serve as CSA infomediaries.

The next section will discuss the various media used in teaching CSA. As mentioned, one of the key activities of this initiative is the integration of CSA modules in the curriculum of the participating schools. In this action research, several media were used to convey CSA lessons. Using 2014 survey round as well as interviews with participating teachers, the next section will inform which media are best to use in bringing thee CSA agenda in the classroom.

B. Teaching media

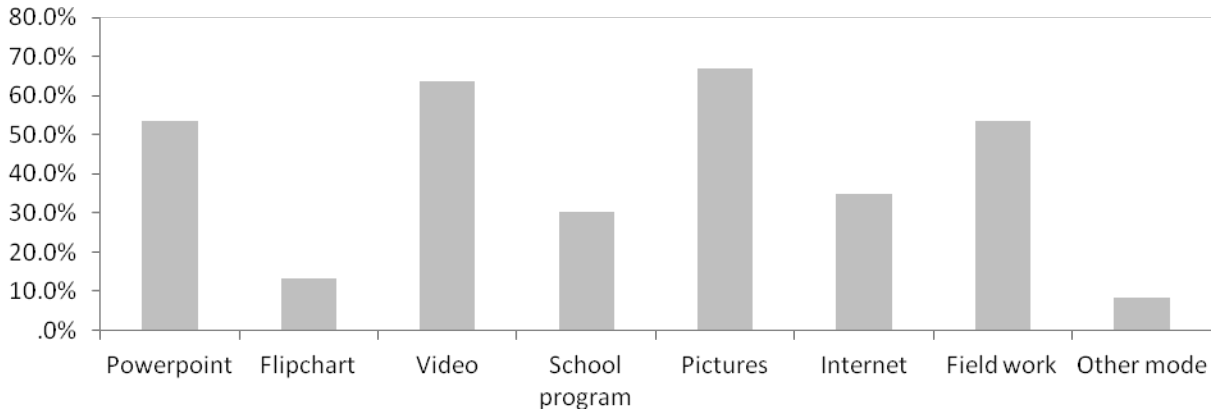

Figure 1. The communication materials used in teaching CSA.

The figure above shows the diversity of communication tools used in teaching CSA. While it is tempting to simply discuss the highlights, the figure shows that each communication tool seems useful in different contexts. First, the use of visual and audiovisual tools is evident as shown by the data on video, pictures, and PowerPoint. More than 50% of the respondents reported they did use said tools in class. The use of videos was fully optimized by schools with good audiovisual equipment such as in INAC (91%), APNHS (98%), BNHS (84%), and CNAHS (93%). Videos shown were the ones given to them through the offline version of the PinoyRice during the training. Turn out in other schools except in SSCHS is also good. This provides good input on the succeeding steps that the Campaign should tread, and that is producing more educational videos for the infomediaries. McNaught et al., (2014) noted in their study among farmers in the Pacific, videos are good in conveying basic messages about climate change. This somehow sits well with the findings of this study as the videos contained in the PinoyRice show basic technology how tos with some very clear messages.

The pictures, they must be the posters on harmful and helpful organisms, proved very useful as exemplified by their usage in all schools (above 50%, except in MNHS, 32%). Teachers posted them on the walls of their classrooms while some even put up their own Infomediary corners such as in MNHS and LAIHS. Infomediary corners resemble mini libraries created by the teachers for all rice-related knowledge products. Use of instructional posters seemed extremely useful in schools with poor internet connectivity such as in SSNCHS (54%). McNaught et al. (2014) noted that pictures are useful but must be used together with other media. They cannot be the standalone type. At some point, this is probably on a case to case basis particularly on the quality of execution of the visuals. The posters distributed were meant to be standalone materials, and, hence they were used extensively by the participating schools. The PowerPoint presentations developed for this Project received good feedback from the teachers as they were the “ready-to-teach” type of materials. They were also in Filipino and popularized. PowerPoint presentations were not recommended by McNaught (2014) among farmers. The playing field is probably different with young people who are more or less knowledgeable about making PowerPoint presentations. Nonetheless, this is something worthy of further investigation as this research only asked if the participating teachers used the media cited. Issues concerning effectiveness are yet to be addressed. Pictures and videos were also shared in the online and offline versions of the PinoyRice.

On the other hand, strategies that required face-to-face interactions likewise proved relevant. This is true in the case of school programs and field activities. School programs were not as popular as other communication tools/strategies in the sense that not all had the chance to hold one relating to the campaign. Those who initiated at least one big school activity, however, managed to drive home the key messages of the campaign. The case of LAIHS illustrates this. Seventy-eight percent of the respondents reported they used this for disseminating CSA. The school organized a field day where local executives and parents were invited. This same activity was documented in CRVS and in SJNAIHS. These schools do have the capability to mobilize their community, which is in part a big help in disseminating advocacies relating to CSA. Hence, this is another mechanism that the campaign should focus its attention on—how to support schools in conducting community-based events. Moreover, in select schools where the Infomediary Quiz Bee was conducted, the team noted a different level of awareness among students as reflected by the high scores that they got. The event prompted the students to study about climate change and rice production. McNaught et al., (2014) noted that face-to-face exchanges have proven to be effective in climate change adaptation.

Figure 2. Students of SJNAIHS in Occidental Mindoro (a) on their way to the forum site (b) during the farmers' forum, one of the students talking about some climate change and rice production topics.

Done properly (during the morning, in groups, fun way, or in the afternoon as they no longer have to clean themselves for their next class), field work can be a good practical tool. This is true in all schools especially in SSNCHS. Learning by doing is something that is emphasized in this activity. In the Infomediary Campaign Facebook Group, there is massive

documentation of how some students enjoyed this activity. UK STC (2007) noted that active engagement of young people produces more productive results as opposed to just letting them be passive receivers of intervention. More involvement of females is one thing that should be improved in this activity. Scheduling was also an issue as some did the planting when the sun was already high up. Hence, students no longer wanted to participate. These small things should be attended to lest they downplay the big things that can result from this Campaign.

Figure 3. Students of SSNCHS in Eastern Samar harvesting produce from their rice garden (photo uploaded by participating teacher in the Infomediary Campaign Facebook group).

There are several lessons that can be drawn from these findings. First, the findings reinforce the need for context-specific mechanisms. This is something that has been echoed quite a few times in the climate change adaptation discourse. It is said that interventions must be something that is organic from the community (McNaught et al., 2014; Diehl et al., 2015). Second, and which needs to be highlighted is the need to ponder on how different media are useful. Often, there is the so-called ICT bias when it comes to dealing with young people. ICTs are seen as a "magic wand" (Mansell, 2006) as though it can address all concerns especially if the tech-savvy young people are concerned. It should be noted that ICT infrastructure remains challenging in many rural areas where the agricultural communities are. In the previous work of the authors, it was noted that there are areas with no electricity (Manalo et al., 2014). Hence, in no way will ICT platforms be useful in these areas. World Bank (2011) noted that development interventions must not think of how to fit in ICT as a

solution, rather explore all possible solutions (not just ICTs) to the development issues at hand.

C. Perception and knowledge of students on climate change

In the 2015 survey data, 99% of the students reported they have already heard about climate change. The disaggregated data on the students' perceptions of the impacts of climate change on rice production (Table 4) offer several insights. It seems palpable that the percentages for increase in temperature, typhoon and flood, and drought are higher in 2014 sites than those in 2015 sites. The result for drought (Table 3) is statistically significant (Sig. 2-tailed t=.02700).

Table 3. T-test for the perceptions on climate change.

Variables	T-test for equality of Means (Sig 2-tailed) 5% level of significance
Increase in temperature	0.44600
Typhoon and flood	0.63100
Drought	0.02700
Salinity intrusion	0.66200
End of the world	0.54200
No idea	0.89800
Others	0.17300

A plausible explanation for this is that schools that have been engaged since last year may have been more aware of climate change owing to the various activities conducted in their respective schools. It should be noted that while all students surveyed are new to the Campaign, those coming from 2014 sites must have participated in at least one Infomediary-related event where CSA must have been tackled. Additionally, the "end of the world" and "no idea" categories likewise scored low, which indicate that the science of climate change has been well communicated. Some of the notable rice-producing provinces such as Isabela, Nueva Ecija, and Leyte, seem to have felt the impact of climate change through increase in temperature. Typhoon and flood were observed to be highest in RDCAS (Nueva Ecija). The students explained during their participatory drawing how typhoon Santi swept away their

crops. These findings resonate observation that people tend to associate impacts of climate change on recent events (Dang et al., 2014) or there might be some confusion between associations related to weather (short-term) and climate (long-term) (Gbetibouo, 2009). The second observation where people get confused with phenomena related to weather or climate borders with the blame-it-all to climate change discourse. McNaught et al. (2014) cautioned against the blame-it-all discourse as it oftentimes leads to thinking that local solutions are not available.

On the other hand, it is quite surprising that schools in the Visayas, which were badly hit by typhoon Haiyan (Leyte and Antique) did not give very high scores on typhoon and flood. Hence, this finding partly challenges Dang et al.'s (2014) observation. Drought was highest in Leyte.

Table 4. Disaggregated responses on the perceived impacts of climate change on rice production.

2015 sites							Sites since 2014					
	NAVS	JRS	BNSHI	MAIHS	**Average**		RDCAS	LAIS	SNAIHS	BAIHS	CAHS	Average
Increase in temperature	90.91	91.67	82.05	67.21	**82.96**		96.36	91.84	75.00	88.46	89.09	88.15
Typhoon and flood	72.73	56.25	71.79	68.85	**67.41**		83.64	65.31	68.18	80.77	55.93	70.77
Drought	68.18	89.58	66.67	68.85	**73.32**		89.09	95.92	86.36	82.69	87.27	88.27
Salinity intrusion	54.55	56.25	30.77	26.23	**41.95**		47.27	42.22	38.64	46.15	12.73	37.40
End of the world	6.82	8.33	2.56	0.00	**4.43**		5.45	0.00	4.55	3.85	1.82	3.13
No idea	4.55	2.08	0.00	0.00	**1.66**		5.45	0.00	0.00	0.00	1.82	1.45
Others	0.00	8.33	2.56	14.75	**6.41**		12.73	26.53	15.91	15.38	1.82	14.47

There are several important points that can be drawn from these findings. First, it is imperative that the scoping studies look into the perception and knowledge of the students on climate change as perception and knowledge are important factors before anyone can be mobilized for action. The IPCC (2007) noted that how one interprets information (perception) is more important than the information per se in the adaptation process due to the cultural, societal, and other contextual factors.

The findings suggest that the implementation should focus on how to best mobilize students for action knowing that most of them are already aware. It is advised that for climate change adaptation to be successful, one should veer away from stand-alone climate change awareness campaigns (McNaught et al., 2014); more in-depth learning and understanding is necessary (Harvey et al., 2012).

D. Sources of information on climate change

More than half (55%) of the students reported they learned about climate change from their respective schools. This is an important point as during the time of data collection, teachers who were trained on CSA and rice production have already lectured on this topic. In 2014, students heavily relied on traditional media outlets such as the TV, radio, and newspaper as sources of information on CSA (Manalo et al., 2015a). Hence, this goes to show that the information sharing mechanism (teacher to students) in place seems to be working. Hence, if the schools will be properly mobilized on CSA, they can play pivotal roles in helping farmers manage the impacts of climate change.

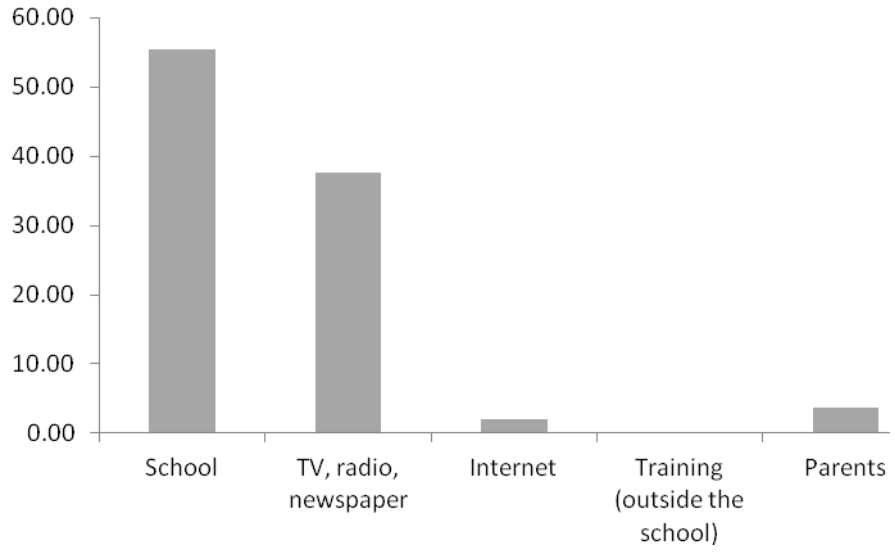

Figure 4. Information sources where the students first learned about climate change.

On hindsight, the findings can be read to have several implications as well. First, this finding is favorable as far as the modules are concerned. This means that the modules developed under this initiative were put to good use. This reinforces observation of Kabir et al. (2015), although their study is under the health domain of climate change, that modules are effective in improving the knowledge of the students on this subject. The authors, however, concluded that the effectiveness of modules in influencing behavior is yet to be seen. Second point is the need for a more focused and high-quality engagement of teachers on climate change, and for the purposes of the project, on CSA.

In the Philippines, content will be a major issue as teachers have inadequate access to teaching materials on CSA. Filling in this gap means that schools can serve as a reliable information hub in these rural communities. In the literature, access to information on climate change is positively linked to adoption and/or adaptation (Dang et al., 2014). The third point relates to how the teachers should be capacitated so they have everything they need to step up this initiative. As climate change is an important topic,

investments on training good communicators who will talk about this subject must well be in place (McNaught et al., 2014; Diehl et al., 2015; Lebongha et al., 2015). It is known that among the barriers to adapting and/or adopting CSA technologies is the quality of the information sources (Dang et al., 2014) and the relationship among sources of information and their intended recipients (IPCC, 2007; Lebongha et al., 2015). If teachers are well capacitated, they can then be more effective in addressing the "adaptation deficit" on CSA.

The disaggregated data on where the students first learned about climate change establish quite a number of things (Table 6). The data suggest that for 2014 sites, schools were the number one source of information. This finding (Table 5) is also statistically significant (Sig. 2-tailed t=.05).This means that the information sharing in place is working. This is not yet very obvious in 2015 sites as most of them still rely on traditional media (radio, TV, and newspaper). For 2014 sites, use of internet to know more about climate change is significantly higher than in 2015 sites. SJNAIHS and CNHS reported highest percentage of Internet usage. Evidence of internet usage was present in these schools as validated during the field visits such as the introduction of PinoyRice in their respective classes. Cases of peer-to-peer sharing, albeit just a few, took place among 2014 sites (5.32%).

Table 5. T-test for the sources of information.

Variables	T-test for equality of Means (Sig 2-tailed) 5% level of significance
School	0.05
Radio, TV, newspaper	0.89200
Internet	0.13200
Training outside the school	0.23800
Parent	0.12100
Friends	0.19800
Other means	0.56800

Further investigation may be in the right direction: To what extent do they bring into their public spheres their knowledge on CSA? The fact that instances of peer sharing transpired means that CSA merits a space in their public sphere. Corollary to this point is to investigate how this peer-to-peer sharing on CSA can affect positively or negatively sharing of information to farmers. To what extent can it be reinforced so it remains as an affirmative action and useful in addressing the "adaptation deficit" (Ford et al., 2014) on CSA?

Table 6. Disaggregated responses on where they first learned about climate change.

2015 sites							2014 sites				
	NAVS	**JRS**	**BNSHI**	**MAIHS**	**Average**	**RCAS**	**LAIS**	**SNAIHS**	**BAIHS**	CAHS	Average
School	34.09	85.71	43.59	34.43	49.46	65.45	87.76	93.18	63.46	94.55	80.88
TV, radio	54.55	52.08	51.28	49.18	51.77	27.27	40.82	68.18	28.85	85.45	50.11
Internet(website, Facebook, Instagram, etc.)	4.55	0.00	0.00	3.28	1.96	1.82	4.08	27.27	5.77	34.55	14.70
Training (outside the school)	0.00	0.00	0.00	0.00	0.00	0.00	4.08	15.91	0.00	1.82	4.36
Parents	9.09	0.00	2.56	6.56	4.55	3.64	12.24	36.36	5.77	36.36	18.88
Friends	0.00	0.00	0.00	0.00	0.00	1.82	2.04	4.55	0.00	18.18	5.32
Others	0.00	0.00	0.00	4.92	1.23	1.82	0.00	9.09	0.00	1.82	2.55

E. Teachers as champions

In the past 2 years, teachers have shown that they form a significant part of the infomediation chain. They did plenty of innovations on their own to best implement this initiative in their respective areas. Hence, they are the champions of this initiative (Manalo et al., 2015). Ramirez and Quarry (2009) note champions are people who are driven and passionate about stepping up the development initiatives so it is able to touch more lives. Table 7 shows some of the innovations initiated by the teachers. These activities were all done by them with minimal support from the project.

Table 7. Innovations captured in the Infomediary sites.

Innovation	Description	Site seen
Classroom discussion	Discussion of climate change and rice production in class using the modules developed in this project	Almost all sites
Promotion of the project in the Parents and Teachers Association general assembly meeting	The teachers talk about the project in the biggest gathering of parents in their school. Hence, reaching more farmers in the area on their own initiative.	Negros Occidental
Collaboration with local government units	Teachers collaborated with their LGUs to better implement the campaign (borrow land for the rice garden, solicit support for the Field Day)	Albay, Occidental Mindoro, and Cagayan
Publishing of CSA information in school papers	CSA technologies and practices (how tos) were published in the school newspapers reaching more farmers in the community.	Albay, Abra
Infomediary Corners	These are library corners for CSA materials.	Ilocos Norte, Sarangani, Cagayan, Bulacan, Davao, Aklan, Cateel
Across subjects integration	CSA is integrated in various subjects	Biliran, Davao City, Bulacan
Promoting the campaign in other schools	Teachers reproduce the materials they received during the training and give them to other schools; they also provide seeds to other schools	Saranggani
Information drive in nearby communities	CSA information drives among farmers in nearby communities where students served as the resource persons; teachers were on the background	Occidental Mindoro, Cagayan, Ilocos Norte, Davao Oriental, and Occidental Minndoro

Figure 5 shows the infomediation process documented during the 2014 implementation of the Campaign. There are three communication pathways for CSA information to reach the farmers, and in all three the teachers are present. From PhilRice where they had their training on CSA and rice production, the teachers were instrumental in bringing knowledge to farmers in various ways: either through their students, themselves, or through the PhilRice mechanisms, which they introduced to their students.

This finding has several implications. First, there is a need to invest on training the teachers. This is something that was highlighted earlier. The second point is to ensure that the teachers are trained both on the technical aspects of CSA but also on the extension side as well. It is supported in the literature that adaptation is greatly enhanced by the quality of information passed on the relationship of the people involved (Baloyi (2011) as cited by Lebohang et al., (2015) in the infomediation process.

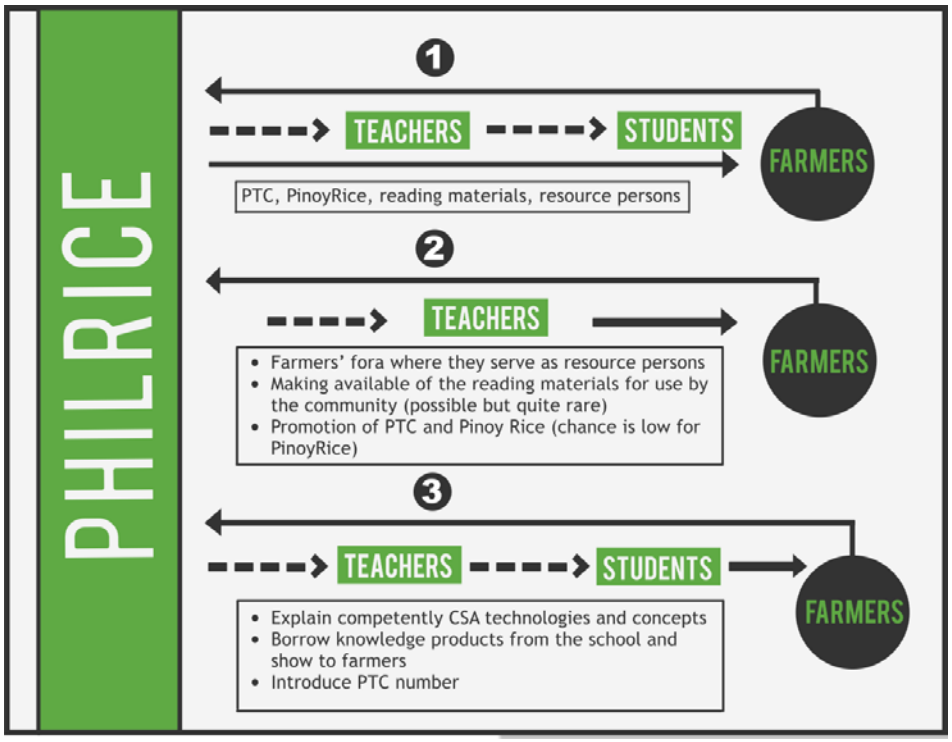

Figure 5. Communication pathways on bringing CSA to farmers under the Infomediary Campaign.

Teacher as champion: The case of Bagumbayan Agro-Industrial High School in Davao Oriental

Bagumbayan Agro-industrial High School in Davao Oriental has been participating in the Infomediary Campaign since 2012. The participating teacher has participated in all training programs including the last two on Climate-smart agriculture and rice production. She is an agriculture graduate, and has scored consistently high in the post-tests during the training programs. Back in BAIHS, she teaches Crop Production subjects with students from Grades 9 and 10 or about 15-16 years old.

Davao Oriental is among the major rice-producing provinces in the Philippines. People surrounding BAIHS rely on rice-farming and agriculture in general for their livelihood. In the school, this initiative is fully supported by the key school officials. The faculty and the school officials have harmonious relationship and support is visible during campaign activities.

The participating teacher has initiated to conduct several activities relating to Campaign implementation. Among them is the manufacturing of carbonizer to produce carbonized rice hull. This was learnt by the teacher during her training from this project. At present, BAIHS has manufactured several units of the carbonizer and they also have produced CRH, which they are selling to farmers in their area. As of this writing, several farmers have already bought CRH from the school. Hence, this has now become as one of the income generating projects of the school. BAIHS has also conducted demonstrations on CRH production among farmers in their community in the school. The students led the demonstration while the teacher supported the students should there be questions that were beyond the knowledge of the students. In the PhilRice Text Center, students from BAIHS are also active texters. The PTC received 445 text messages from them from January 2014 to November 2015.

BAIHS can be said to be a model site for this initiative. It has laudable elements that contribute to the success of implementation of this project in the school. The characteristics of the participating teacher (agriculture graduate, driven, industrious) exemplify a true champion of a development initiative as describe d by Quarry and Ramirez (2009). The location of the school, which sits in an agricultural, particularly a rice-farming community is favorable for this project. Previously, it was identified that the Infomediary Campaign is far more successful in agricultural areas as opposed to areas with plenty of livelihood sources. This is something that is strongly supported by Amartya Sen's Capability Approach, which basically says that people will value something that they have a reason to value.

A supportive organization is also supported in the previous work of the authors (Manalo et al., 2014; 2015). Likewise, it is said that for any development intervention to succeed, it must be taken into account that the organization is half the methodology (Bessette, 2004, p. 104). The favorable behaviour of the students and the whole community towards this project can be explained by the high relevance of the project for them. It is known that context-specificity is a major consideration for any climate change adaptation mechanism.

Conclusion

This article cogently presents a strategy on how to assist some of the most vulnerable populations to adapt to the impacts of climate change. As it stands, there seems a negligible effort to include the most vulnerable groups in the adaptation agenda even as the number of mechanisms to arrest the impacts of climate change are in place. Drawing on from the findings of this study, the need for context-specific strategies in mobilizing young people as CSA infomediaries in the rice-farming communities is extremely important. The social milieu and the various social actors and actresses in the community must well be considered to inform the interventions that will be put in place. This study has plenty of practical implications. Among them is the need for a supportive macro structure. This initiative heavily rests on having a structure and /or organization (the DepEd) that permits the existence of the Campaign and all the activities connected to it. This is something that is not always present and not always easy to realize. Strong organizational support is central to the success of this initiative. Another thing is to seriously consider training of teachers as they are the champions of this initiative, aside of course from the students themselves. Careful reflection is needed on how to actively capacitate them so they can achieve even bigger things for their respective communities. Lastly, what this article has shown is that young people can be a force to be reckoned with as far as being infomediaries on CSA is concerned. While this paper has provided plenty of insights on the profile and some youth engagement styles, the strategies on how to successfully engage them remain open for practitioners and scholars to explore.

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Glossary

Infomediaries - These are high school students mobilized to serve as information providers on climate-smart rice agriculture in their rice-farming communities. Infomediary is a combination of two words-information and mediation.

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