

# The use of podcast in disseminating agricultural technology innovation: A SWOT analysis

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**Abstract.** Downloadable audio files called podcasts have become popular within many areas of communication. Agricultural technology and innovation disseminators may wish to deliver their work to a larger audience but may not know how. The present study aims to explore the use of podcast series as a media for disseminating agricultural technology innovation and demonstrate the sustainability, and acceptance level of this dissemination platform. The agricultural technology innovation produced by Indonesian Agency for Agricultural Research and Development (IAARD), Ministry of Agriculture were used as an input in creating a weekly series of agricultural and technology review podcasts. Based on the analysis of the SWOT approach, the right strategy in developing podcasts in the future is a weakness and opportunity strategy, where podcasts are a new thing that has several weaknesses as well as opportunities to be developed.

## 1 Introduction

Information technology has been widely used in various sectors. One of the internet's uses in the agricultural sector is to disseminate innovations to the community. Through information technology, dissemination of information become easier and cheaper. This is also supported by the development of information media platforms such as Facebook, Instagram and Youtube. The Hootsuite survey showed that in 2020, 64% of Indonesia's population were internet users with an average access time of 7 hours 59 minutes per day. These internet users increased by 17% compared to 2019 [1]. This data shows that information technology has a close relationship with the Indonesian people in meeting information needs including agricultural information.

Podcasts are information technology media in the 4.0 revolution era. Podcasts are digital audio files containing information uploaded and downloaded through certain websites or portals to a computer or portable device [2]. Podcasts are similar to radio broadcasts but can be available anytime and anywhere. Unlike conventional radio, podcasts do not broadcast linearly because podcasts are an on-demand voice platform [3]. Because of its on-demand nature, a podcast can be listened repeatedly [4]. The potential of podcasts lies in its advantages, among others, can be accessed automatically, can be controlled by listeners, and easy to used [5]. PEW Research Center reported that in 2006 in America,

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only 11% of people listened to podcasts, and by 2019 that number had increased significantly to 51% [6]. This indicates that people have used podcasts as an alternative media in enjoying audio content. Moreover, the Hootsuite survey in 2020 shows that 43% of 171 million internet users in Indonesia access information through podcasts. Podcasts can be an opportunity for audio content developers, including managers of conventional radio broadcasts in Indonesia.

Millennials, nowadays, are the main actors in agriculture. However, in the period of 2015–2017 there was a decline in the millennial generation involvement in the agricultural sector with negative growth of 8% per year [7]. Millennials, who are productive residents, use digital technology in all aspects of their lives, including podcasts. Several world surveys conducted by podcasters show that the millennial generation is the most podcast audience. Daily Social reported that the age of podcast listeners in Indonesia is 40 percent from 20-25 years old (42.12%), followed by 26-29 years old (25.52%) and 30-35 years old (15.96%) [8]. This shows that podcasts are highly potential in disseminating agricultural information to increase the millennial generation's interest in the agricultural sector.

Indonesian Center for Agricultural Technology Assessment and Development (ICATAD), Indonesian Agency for Agricultural Research and Development (IAARD), Ministry of Agriculture, as an institution for agricultural technology innovation dissemination, welcomes podcasts as alternative tools in disseminating agricultural information. *Pertanian dan Teknologi* Podcast (Agriculture and Technology Podcast), an Indonesian-language podcast has been broadcasting since January 2020 until today. This paper generally aims to analyze the sustainability and the acceptance of *Pertanian dan Teknologi* Podcast and seeks some strategies in developing the agricultural podcast to improve the number of listeners. This paper also discussed a comprehensive review related to the use of podcasts in the agricultural sector in the future.

## **2 Materials and methods**

### **2.1 Sustainability and acceptance level of *Pertanian dan Teknologi* Podcast**

This study measures the sustainability and acceptance level of *Pertanian dan Teknologi* Podcast by distributing open-ended questions to 65 frequent listeners who often listened to this podcast at least once a week [9]. Data of frequent listeners was retrieved from the Spotify statistical data, as the platform for broadcasting the podcast. The results of the survey data are also used as a reference for SWOT analysis and for making podcast development strategies.

### **2.2 Identification of internal and external factors**

The initial stage in SWOT analysis method is identification of internal and external factors. The scopes of internal factors are around podcast production and podcast listeners, while external factors are factors that cannot be controlled by podcast manager. Based on the results of a survey conducted to frequent podcast listeners, internal factors are then formulated, namely strengths and weaknesses; while for external factors, namely the relevant opportunities and threats. This analysis will produce 4 possible combinations of strategic alternatives to create a podcast development plan which is described in the SWOT matrix as shown in Table 1 [10].

**Table 1.** SWOT matrix

	Internal factors	
External factors	Strength	Weakness
Threat	ST	WT
Opportunity	SO	WO

### 2.3 Strategy of podcast development based on SWOT

In determining priorities, the assessment of weights and scores on internal and external factors is carried out. The total of weights determines the ranking (level) of strategic alternative priorities. The assessment is carried out by making an assessment table for internal strategic factors and external strategic factors consisting of 4 columns. The results of the SWOT analysis then are being integrated to get the right agricultural podcast development strategy.

## 3 Results and discussion

### 3.1 Production of *Pertanian dan Teknologi* Podcast

*Pertanian dan Teknologi* Podcast has two segments namely *Pertanian dan Teknologi* with general theme and *Colenak* (Education for Cattleman/*Celoteh Edukasi Peternak*). There are several types of podcasts, namely audio podcast, improved podcast (using audio with additional slides and pictures) and video podcasts [11]. Based on the mentioned categorization, *Pertanian dan Teknologi* Podcast falls into the audio podcast type.

#### 3.1.1 Structure of *Pertanian dan Teknologi* Podcast

*Pertanian dan Teknologi* Podcast uses uplifting opening music for 12 seconds, starting with greetings from the host. The use of opening music is expected to give encouragement to listeners. Meanwhile in the *Colenak* segment, a collection of cattle sounds with a comedy nuance is used as an opening music for 1 minute 15 seconds. This kind of opening music is used in accordance with the topic of *Colenak* podcast, namely about livestock. *Pertanian dan Teknologi* Podcast segment is delivered using a formal interview style, while the *Colenak* segment using a more relaxed comedy drama.

*Pertanian dan Teknologi* Podcast always introduces the speakers before entering the conversation because the speakers are always changing in each episode. Meanwhile, the *Colenak* segment presents an introduction by telling a certain background according to the topic being presented. The background is delivered by role playing style, portrayed by the same host and resource person.

*Pertanian dan Teknologi* Podcast conveys more diverse information including technical technology for agriculture and animal husbandry, product processing, agricultural institutions, information communication technology and success stories. Hence, it presents a variety of sources, while the *Colenak* segment limits the topic, namely about the world of animal husbandry, especially in technical matters so that it can be delivered by the same resource person. *Pertanian dan Teknologi* Podcast close the information by conveying conclusions so that listeners can understand the content of the presented material easily.

Podcast production was centered around the information on agriculture and technology produced by IAARD. Each podcast was constructed around a central topic selected by the

creators (extension specialist from ICATAD). Subsequently, episodes were recorded, typically with two persons composed of one host and one resource person.

The recordings were done by the host and resource person using the same microphone in the same room or using video conference when the host and resource person are not in the same place. The episode duration was 20 to 30 minutes on the average. Episodes were recorded in a single take.

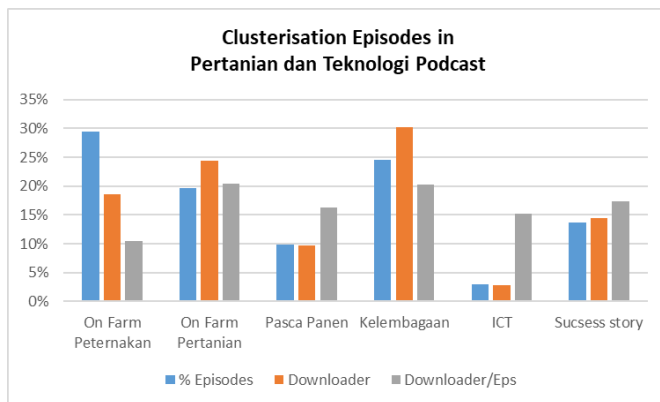
Episodes were edited using the mobile app, like Kinemaster or using computer application like Audacity. Each episode has different cover art in line with the topic in the podcast episodes, to make it more interesting. The cover arts were created using computer application like Adobe Photoshop or mobile app like Canva.

The edited podcast and the cover art are then published on Anchor.fm platform to be distributed into 6 automatically connected platforms, including Spotify. Podcast episodes are published twice a week, 1 segment for agriculture and technology and 1 segment for *Colenak*.

### 3.1.2 Episodes Cluster

There were seventy-eight episodes released from January 2020 to May 2021. Topics covered in *Pertanian dan Teknologi* Podcast consist of several clusters including:

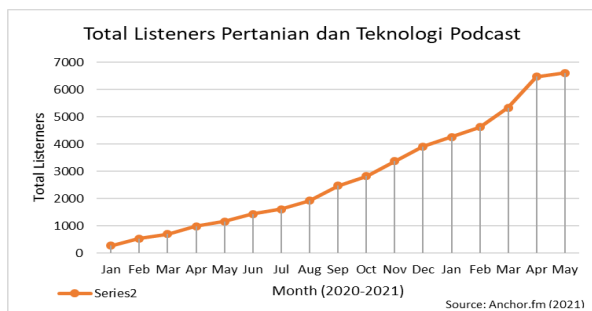
1. Agricultural Cultivation: contains information, technology and technical tutorials on agricultural cultivation from planning, agroinput, onfarm and agro-commerce
2. Livestock Rearing: discusses information, technology and technical tutorials in the field of animal husbandry, both planning, agroinput, onfarm and agrocommerce.
3. Yield Processing: discusses information, technology and post-harvest tutorials (agroprocess) from agricultural and livestock cultivation
4. Institutional: This cluster discusses the introduction and development of agricultural institutions, both formal and informal institutions
5. ICT (Information Communication Technology): discusses information and communication technology that supports agricultural and livestock development activities.
6. Success Story: presents public figures, both officials, agricultural/livestock officers, business actors and main actors to share stories in the agricultural and livestock sectors that have been experienced.



**Fig. 1.** Episodes Clustering in *Pertanian dan Teknologi* Podcast

### 3.2 Acceptance of *Pertanian dan Teknologi* Podcast

Based on the data of listeners, there is an increase in line with the number of episodes published by *Pertanian dan Teknologi* Podcast. This data shows that podcast media are increasingly in demand by the public. In the January-April 2020 period, the average podcast listener is 247 listeners per month, while in 2021, the average number is increased to 639 months. This phenomenon is inseparable from the Covid-19 pandemic in Indonesia. The increase number of podcast listeners in one year has reached 38%. This illustrates that people need to access the information easily, especially in the current limited access to information due to pandemic Covid-19. The podcast has had 6610 downloads to date (287/month January 2020, increased to 1133/month April 2021). It obtained 372 Spotify followers

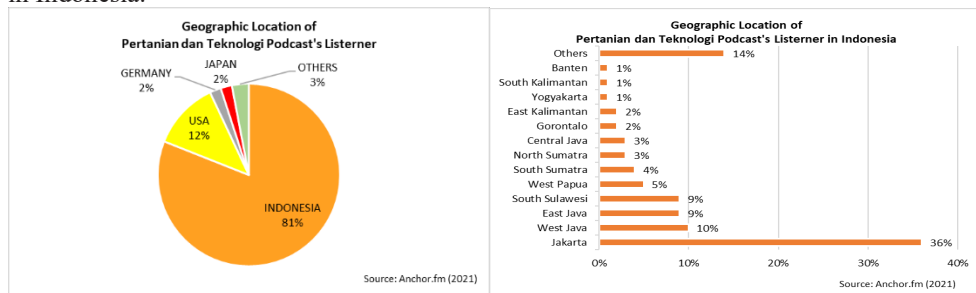


**Fig. 2.** Total of *Pertanian dan Teknologi* Podcast listeners

There were five listening platforms used by listeners, namely Spotify, Anchor, Apple Podcasts, Google Podcasts and other. The most platform used was Spotify. Spotify developed their businesses in Indonesia in the past 2 years. Previously, many Indonesian citizen subscribe to Spotify as their music player platform in their own gadget, besides Spotify and Anchor provide their services free of charge to their subscribers.

#### 3.2.1 Geographic Location

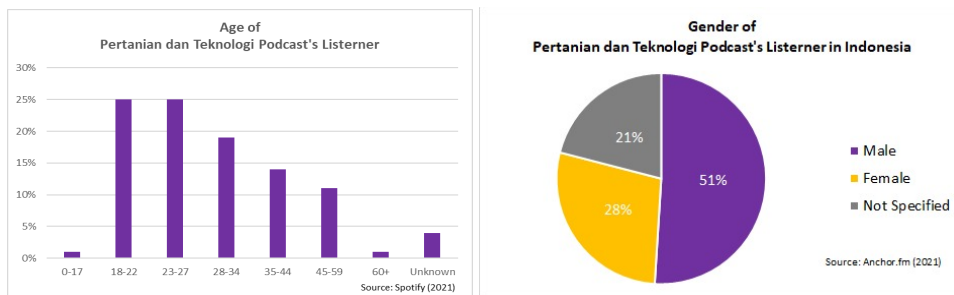
Downloads were recorded in more than 10 countries all over the world, as shown in Figure 3. Eighty-one percent of downloads were from within the Indonesia, with the other 19% represented by international downloads. Based on geographic location by provinces, most of the listeners were from Jakarta, West Java, South Sulawesi, East Java, West Papua, South Sumatra, North Sumatra, Central Java and Gorontalo. The highest number of listeners came from Jakarta and West Java. This is related with the different connection and internet access between big city area such as Jakarta and West Java compared to other areas in Indonesia.



**Fig. 3.** Geographic location of *Pertanian dan Teknologi* Podcast listeners; all over the world (left), in Indonesia (right)

### 3.2.2 Age and Gender

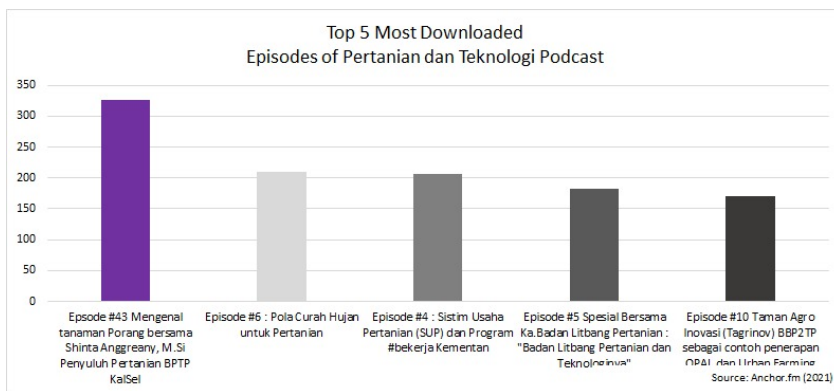
Based on the age, listeners were ranged from 18-22 years, 23-27years and 28-34 years. This shows that most of the listeners were from millennial generations. While in terms of gender, most of the podcast listeners are male, (51%) compared to female (28%). It is assumed that men work full time compared to women, which means men are more likely to be out of their home during the day and that's where they consume more podcasts. However, the genders of 21% listeners were not specified since they didn't use personal account when downloading the podcast.



**Fig. 4.** Age and Gender of *Pertanian dan Teknologi* Podcast listeners

### 3.2.3 Most downloads

Most downloads were for episodes “Introduction to Porang Plant” (327), “Rainfall Patterns for Agriculture” (210), “Agricultural Business System and Program of *Bekerja* by Ministry of Agriculture” (206).



**Fig. 5.** Most downloaded episodes of *Pertanian dan Teknologi* Podcast

In 2020, Porang (*Amorphophallus muelleri* Bl.) becomes trending commodity in Indonesia. Porang tubers have high economic value for their glucomannan which is good for health and can be easily processed into food and cosmetic industries. Porang plants can also be an alternative to move the community's economy in the midst of the Covid-19 pandemic. The porang farmer's success story motivates the community to seek more information about the plant. This makes people have more enthusiasm to find information, one of which is through podcasts. *Pertanian dan Teknologi* Podcast has also published an episode in Porang topic and got a lot of listeners.

### 3.2.4 Listeners' Comments

Listeners' comments of *Pertanian dan Teknologi* Podcast were entirely positive. Examples include:

1. Informant A: In the early 2020, I seek Indonesian agriculture podcasts on Spotify. There were only 1-2 channels and not really updated, they only have a few episodes. Finally, one day I found *Pertanian dan Teknologi* Podcast by Mr. Dani on Spotify, which I still subscribe to today.
2. Informant B: The resource persons have been very good so far. Each has unique skills and experiences. Maybe, occasionally, you can also invite resource person who have a great attention to agriculture even they are not a farmer/agriculture practitioner. Previously, Mr. Dani had invited his friend, Mr. Budi Ace. I really enjoyed the conversation between the two of them.
3. There should be a team of hosts who have their own specialties. For example, for youth, farmers, and official resource persons.

### 3.3 Identification of internal and external factors

In this study, the unit of analysis is the production and use of podcast media. All factors related to podcast production and use are classified as internal factors. Meanwhile, conditions that cannot be controlled in podcast development are classified as external factors. A comprehensive description of internal factors namely strengths and weaknesses, as well as external factors namely opportunities and threats can be seen in Table 2.

**Table 2.** Internal and External Factors Analysis Summary (IFAS & EFAS)

	Score	Weight	Total Score
<b>Strength</b>			
Fast creation process compared to video	4	0,08	0,32
Material/voice retrieval is easier	2	0,06	0,12
The tools used are easier to obtain and cheaper	3	0,06	0,18
Does not require certain skills such as making videos	3	0,08	0,24
Under ICATAD, dissemination institution	4	0,08	0,32
Podcasts can be played back	4	0,05	0,2
<i>Subtotal for Strength</i>			1,38
<b>Weakness</b>			
Less of visual aids	-4	0,11	-0,44
Tend to be considered boring, only audio	-1	0,06	-0,06
So far, podcasts are made spontaneously without scripts	-2	0,07	-0,14
Lacks agricultural theme branding	-1	0,05	-0,05
Needs the high-quality equipment	-3	0,05	-0,15
Needs room without noise	-4	0,1	-0,4
Specific audience and still not yet popular in Indonesia	-4	0,1	-0,4
Not disability friendly, especially for hearing problem	-1	0,05	-1
<i>Subtotal for Weakness</i>		1	-2,64
<b>Opportunity</b>			
New things, the number of listeners continue to increase [12]	4	0,08	0,32
Does not require a large quota compared to video	4	0,08	0,32
Decrease in the number of agricultural radio listeners	3	0,08	0,24
Wider distribution, can reach all over the world	3	0,1	0,3
Can be played on various platforms for free	3	0,1	0,3
Most of the frequent listeners are millennial	3	0,05	0,15
Compared to IG or YouTube, can be heard when working or doing something	3	0,04	0,12
ICATAD's branding as an agricultural innovation dissemination institution	4	0,08	0,32
<i>Subtotal for Opportunity</i>		1	2,07
<b>Threat</b>			
more dissemination through social media which is easier	-3	0,08	-0,24
not real-time	-1	0,08	-0,08
less of visual aspects compared to IG	-4	0,11	-0,44
Farmers still don't use gadget requirement for listening podcast	-3	0,12	-0,36
<i>Subtotal for Threat</i>			-1,12

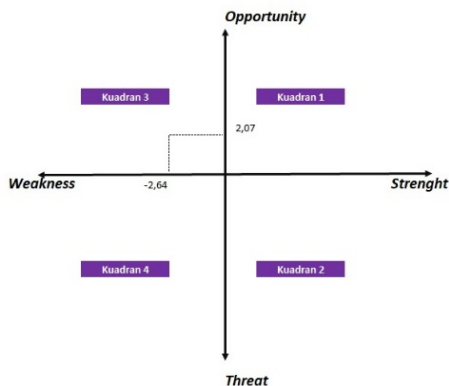
From the results of the matrix values above, the quadrant value is sought with the following assumptions to get the X and Y value.

$$S - W = X \quad (1)$$

$$O - T = Y \quad (2)$$

- S : total strengths (S)
- W : total weaknesses
- O : total opportunities
- T : total threats





**Fig. 6.** Matrix quadrant for SWOT analysis

Furthermore, the results of the matrix X and Y values were plotted to the diagram as shown in Figure 6. W-O strategies means the managers could overcome weaknesses to pursue opportunities in agricultural podcast.

### 3.4 Strategies of agriculture podcast development

The podcast development strategy is carried out by collecting a number of data which are then analyzed using a SWOT approach. From the SWOT analysis, it was found that the right strategy for podcast development is the WO strategy which will be explained in detail as follows.

**Table 3.** SWOT matrix on *Pertanian dan Teknologi* Podcast development strategy

<p>Internal Factors</p> <p style="text-align: center;">External Factors</p>	<p><b>Strength:</b></p> <ul style="list-style-type: none"> <li>✓ Fast creation process compared to video</li> <li>✓ Fast creation process compared to video</li> <li>✓ Material/voice retrieval is easier</li> <li>✓ The tools used are easier to obtain and cheaper</li> <li>✓ Does not require certain skills such as making videos</li> <li>✓ Under ICATAD, dissemination institution</li> <li>✓ Podcasts can be played back</li> </ul>	<p><b>Weaknesses:</b></p> <ul style="list-style-type: none"> <li>✓ Less of visual aids</li> <li>✓ Tend to be considered boring, only audio</li> <li>✓ So far, podcasts are made spontaneously without scripts</li> <li>✓ Lacks agricultural theme branding</li> <li>✓ Needs the high-quality equipment</li> <li>✓ Needs room without noise</li> <li>✓ Specific audience and still not yet popular in Indonesia</li> <li>✓ Not disability friendly, especially for hearing problem</li> </ul>
<p><b>Opportunity</b></p> <ul style="list-style-type: none"> <li>✓ new things in the past year continue to increase the number of listeners</li> <li>✓ New things, the number of listeners continue to increase</li> <li>✓ Does not require a large quota compared to video</li> <li>✓ Decrease in the number of agricultural radio listeners</li> <li>✓ Wider distribution, can reach all over the world</li> <li>✓ Can be played on various platforms for free</li> <li>✓ Most of the frequent listeners are millennial</li> <li>✓ Compared to IG or Youtube, can be heard when working or doing something</li> <li>✓ ICATAD's branding as an agricultural innovation dissemination institution</li> </ul>	<p><b>SO Strategy</b></p> <ul style="list-style-type: none"> <li>• ICATAD encourages extension workers to make podcast programs more varied</li> <li>• ICATAD support site-specific themes</li> <li>• Millennial farming/urban farming themes are expanded, millennial communication style</li> <li>• More frequently posting schedule</li> </ul>	<p><b>WO Strategy</b></p> <ul style="list-style-type: none"> <li>• selection of resource persons from the millennial generation with good storytelling skills</li> <li>• selection of interesting and imaginable material</li> <li>• create scripts and action plans</li> <li>• create agricultural podcast branding</li> <li>• develop slides/text type podcasts</li> <li>• promotion to podcaster communities, agricultural extension workers/academics, farmers, other agricultural communities</li> <li>• promotion through guidance and counselling on podcast optimization</li> <li>• infrastructure procurement</li> <li>• development of how-to theme podcasts</li> </ul>
<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>✓ Easier dissemination through other social media</li> <li>✓ Not a real-time media</li> <li>✓ Compared to Instagram, less of visual aspects</li> <li>✓ Many farmers still don't use gadget requirement for listening podcast</li> </ul>	<p><b>ST Strategy</b></p> <ul style="list-style-type: none"> <li>• development of video podcast</li> <li>• develop to visual aspects</li> <li>• capacity building for video podcasts</li> <li>• face-to-face technical guidance using podcasts as supporting tools</li> </ul>	<p><b>WT Strategy</b></p> <ul style="list-style-type: none"> <li>• script creation to lead imaginable conversation</li> <li>• selection of resource person who has a millennial communication style</li> <li>• face-to-face technical guidance using podcasts as supporting tools</li> <li>• ICATAD encourages outreach through podcasts</li> <li>• encourage millennial generation to establish their own podcast channel by conducting technical guidance</li> </ul>

### 3.4.1 Selection of resource persons

One of the disadvantages of audio podcasts is the lack of visual aids [13]. Due to the lack of visual aids, whether or not a podcast is interesting depends on the ability of the host and resource person to create an imaginable presentation of material. It takes hosts and resource persons who have good storytelling skills. The selection of hosts is also related to the survey results i.e. most of podcast listeners are millennial generation. Podcasts, nowadays,

are the millennial generation's preference as a source of agricultural information. Hence, this becomes a challenge for podcast managers to find strategies on how to increase the number of podcast listeners by creating podcast themes that match the current millennial style.

This is also an input from the answer to an open question, to invite the millennial generation, who is also an influencer in agriculture, to become resource persons. The millennial generation has been widely involved in agricultural promotion activities, such as the Millennial Ambassador Selection program conducted by Indonesia Ministry of Agriculture which succeeded in attracting creative young people to encourage other millennial generations. They can be an alternative resource person in *Pertanian dan Teknologi* Podcast to give the motivation for youth listeners to be more actively involved in agriculture.

### 3.4.2 Selection of podcast materials for better branding creation

The selection of interesting, quality and appropriate material according to the needs of the listener is very necessary to make a podcast episode enjoyable for listeners. The previous episodes were made spontaneously without a script. It is strongly recommended that each episode be made with careful preparation. An action plan should be made for one year. This includes creating agricultural theme branding to make it easy for listeners to remember the podcast. ICATAD is very close to its branding as an agricultural innovation dissemination institution. Agricultural information is very diverse from upstream to downstream. ICATAD is able to process them into a valid, reliable, interesting and up-to-date agricultural information rich in innovation for the agricultural community. Several podcasts in agriculture are available covering every imaginable topic, such as updates on crop markets, new technologies, which cover subjects from agri-tech to daily farm management tips. From in depth interview, it is revealed from the listeners' perspective that podcast information sometimes comes from the unique experiences of resource person which are hard to find in written documents.

To create better branding, it is also suggested to prepare a serialized several episodes for one big topic. The speakers for each episode can be different, but the important thing is that listeners could get a complete picture of a topic starting from the current conditions, existing problems, solutions that have been developed now, and what still needs to be done in the future.

### 3.4.3 Procurement of supporting facilities and infrastructure

Podcasts rely heavily on clear sound quality. To create a clear sound quality, several facilities are needed, such as the high-quality equipment and a room without noise [14]. ICATAD as a dissemination institution, can certainly consider podcasts to be one of the priority media in conducting dissemination. So that the procurement of infrastructure for podcasts can be considered to be included in priority activities in designing the annual budget.

### 3.4.4 Podcast information dissemination promotion activities

*Pertanian dan Teknologi* Podcast have a specific audience, namely the agricultural community. However, this can still be improved because according to the survey results, as a new thing, podcast listeners are increasing from time to time. More vigorous promotion of *Pertanian dan Teknologi* Podcast can also be done to the podcaster community, to the professional community of extension workers, farmers, and other agricultural communities

[15]. As a dissemination and extension institution for R&D innovations, ICATAD can also provide technical guidance to farmers by using a podcast media as a supporting tool other than booklets or brochure. ICATAD can also provide online/offline technical guidance to agricultural extension workers/academics on how to disseminate agricultural information using podcasts. With wide distribution throughout the world, podcast packaging can also be done using English about the site-specific agriculture in Indonesia.

#### *3.4.5 Development to an improved podcast*

Podcasts can be equipped with simple slides containing chat scripts/texts that can help disability friendly listeners to follow the podcast content well.

#### *3.4.6 Hands-on or How-to podcast theme concept packaging*

The podcast managers can consider to create a hands-on or how-to podcast theme concept. So, listeners can do a how-to while doing activities. Compared to podcast, people have to use their five senses other than ears to be able to enjoy the video to the fullest. Based on in depth interview, informant said that podcasts can accompany him especially when coming home from work or working in the laboratory (when he cannot access and read documents).

## **4 Conclusion**

The role of *Pertanian dan Teknologi* Podcast has been effective based on its sustainability and acceptance level in disseminating agricultural technology innovation information. This is proven by the number of listeners and followers recorded on the Spotify platform which increased significantly. The information content in *Pertanian dan Teknologi* Podcast is very informative for the agricultural community audience and the message is very easy to understand.

Based on the analysis of the SWOT approach, the right strategy in developing podcasts in the future is a weakness and opportunity strategy, where podcasts are a new thing that has several weaknesses as well as opportunities to be developed. This study mentions several WO strategies including the involvement of millennial generation as resource person, the procurement of infrastructure, to the promotion of the introduction of agricultural podcasts to the podcasters community, the extension profession/academics and farmers.

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