Study on art-oriented re-utilization and conversion of closed school facility for the promotion of rural tourism:

Focus on the case of Echigo-Tsumari Art Triennale of Niigata Prefecture, Japan

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Abstract

Closed schools are increasing in local municipalities due to the decreasing birth-rate and aging population in Japan. On the other hand, the importance of re-utilization and conversion of closed public facilities including schools has been widely noticed recently. Changing the existing use of public facilities into another or selling for private re-development is the general approach of re-utilization and conversion. This paper focuses on the "art-oriented re-utilization and conversion" (AORC) of closed school facilities to promote rural tourism by reusing them as a gallery or art object instead of deconstructing the existing school facility. This paper picks up two local towns in Niigata Prefecture, Japan which are the venues of Echigo-Tsumari Art Triennale (ETAT). Many closed school facilities have been re-utilized for the ETAT since 2000. This paper analyses the strategy of AORC of closed school facilities in ETAT, clarifies their operation mechanism and evaluates the features and effects of each kind of AORC of closed school facility in ETAT based on case research and analysis. Finally, some implications and recommendations for the future strategy of AORC of closed school facilities are concluded.

Keywords

AORC, closed school facility, ETAT, Niigata Prefecture, rural tourism

1. Introduction: the concept of art-oriented re-utilization and conversion (AORC)

Closed schools are increasing in local municipalities due to the decreasing birth-rate and aging population in Japan. On the other hand, the importance of re-utilization and conversion of closed public facilities including schools has been widely noticed recently. Changing the existing use of public facilities into another or selling for private re-development is the general approach of reutilization and conversion. As Saio [2008] mentioned, the closing and integration of public elementary and/or junior high schools have been caused with the merger of municipalities. In such cases, the municipal governments, however, have not had enough consideration for local communities. The local community lost their place for gathering after these school facilities were closed since they used to be the core of the local community. In fact, the budget for new construction of public facilities have fallen sharply in 2010 and have been flat since then, and maintenance and renewal budgets have increased significantly [MLIT, 2010; Uwamori and Tsutsumi, 2016]. The revitalization and maintenance of existing aging or closed schools has become an urgent issue. On the other hand, municipality finance is increasing the severity by population decline. For this reason, it is important to introduce a new approach to revitalize public facilities such as schools rather than to rely on the policy of municipality as before. The concept of "art-oriented re-utilization and conversion" (referred to as AORC) is to effectively utilize the know-how of private companies and art organizations to renovate and re-use closed school facilities, etc., to create the appeal of local tourism, and to re-energize school facilities that were the core of the local community.

AORC of closed school facilities by re-using them as a gallery or art object instead of deconstructing the existing school facility is proposed as a new approach for the revitalization of both closed school facilities and the local community. AORC helps to input art events and to attract visitors and generate new art business and industry.

The paper of Fujino et al. [2010] shows the subjects of retaining elementary schools by revealing the cause of abolishment. The results are summarized as follows: (1) Background of closing down schools today is due not only to a declining birthrate, but also deficit financing of local government and legal assistance of combining schools. (2) Parents and residents are different to the administration in thoughts on closing down their schools, and so they should share their thoughts. (3) Closing schools and converting to branch schools are an effective way to retain schools located among the mountains or isolated islands. Saio [2008] surveyed the past and present situations of 111 schools that were closed during the past 30 years in Ibaraki Prefecture and analyzed the relation of their location. Moreover, continuous relations between the process of closing/ integration and the process of re-use of those school facilities was investigated in the two cases which detail documents, especially considering the effects of the closing schools on the declining rural communities.

According to Nozawa et al. [2012], there were 161 closed schools: 66 % elementary schools, 19 % junior high schools, and 15 % high schools were closed from 1989 to 2009 in Aichi, Gifu, Mie Prefectures. Especially, after around 2003, there was an increase. The number of students decreased greatly, however the number of schools that decreased were few. It is possible that many schools will be closed immediately in the near

future.

The features of municipality closing many schools are the ratio of young people is low, elder people is high, and the forest area is high. In the present situation, it is a problem that the municipality has not a re-use policy of recycling closing schools. Re-utilized schools are the highest ratio of all. As a result, the highest usages for recycling schools are the gymnasium for the neighbourhood, social education for the neighbourhood, other schools, and so on. It is of overriding importance today that we positively use closed schools for various uses without restriction. In the case of Yamaguchi Prefecture, the rate of the re-utilization of closed school facilities is 62 %, un-use and dismantling occupies 26 % and 11 %. Re-utilization as a public school that does not entail the conversion and the physical education facilities is general. It was making the most of subsidy with the case used for the experience interchange facilities by the preservation requests from the local residents. In the case that the local residents borrowed the facility, the largescale improvement of the facility was not carried out, and use as the area activities base is the main [Yamamoto et al., 2012].

In a previous statement about AORC, as Gon [2016] mentions, art can become public art through various art activities undertaken by both artists and community residents at shut down schools. In the second part, it is argued that shut down schools can become a "public space" in the meaning of Hannah Arendt's technical term, by utilization for an art space. In other words, a closed school as a closed public "facility" can become public "space" for public art. From this point of view, he analyses the case of Nishi-Sugamo Arts Factory and introduces the thoughts of Arendt on publicness, or public space.

However, the details of the operation of AORC, as well as how AORC help the promotion of rural tourism, have not been analysed and discussed in previous studies.

2. Introduction of ETAT

Echigo-Tsumari Art Triennale (ETAT) is one of the world's largest international art festivals held once every three years from 2000 in Echigo-Tsumari (Tokamachi City, Niigata Prefecture, Tsunan Town), one of Japan's most heavily snowy areas with depopulation and aging. In the area, where the life of "satoyama", which has been related to the earth through agriculture, is still abundant, the new journey around satoyama is based on the art of a basic principle of "human beings included in nature." It is attracting attention from both inside and outside Japan as an advanced example of community development. The number of visitors reached approximately 540,000 in 2018, which has brought about economic benefits and an increase in the number of employment and exchange. The basic concept of ETAT might be shown as following:

· Satoyama and art:

The twentieth century was the era of the city and the art of the city. However, as the city ailed, art became isolated and gradually lost its latent power to connect people to place, and people to people. The nature and lifestyle of the satoyama of Echigo-Tsumari environment seems to inspire artists to recover the connections and collaborations that art once had but which has almost been lost.

Artworks are dotted across approximately 200 villages rather than displayed in a single center, an "absolutely inefficient" approach deliberately at odds with the rationalization and efficiency of modern society. Wandering among artworks which emphasize the beauty and richness of satoyama and reveal the accumulated temporal layers of human inhabitation opens the senses to the wonder of existence and revives the soul.

Approximately 160 artworks by artists from all over the world are dotted across the 760 km² area of the Echigo-Tsumari Art Field. Visitors are expected to feel and discover satoyama in different seasons via artworks in the fields, unoccupied houses and closed schools.

Co-operation beyond generations, regions and countries:
 In Echigo-Tsumari, artists have no choice but to create their artworks on someone else's land, requiring interaction with locals. The artists' passion and openness to learning moves local people, and they engage with artworks not as spectators but as collaborators.

Echigo-Tsumari Art Triennale has welcomed many young volunteers from cities. They call themselves the "Kohebitai" (little shrimp gang) and have been involved with many different projects. The encounter between the old, who have spent their entire lives on farming thinly populated lands, and students, who do not have clear purpose in their city lives, resulted in collision and confusions at first, but this transformed into appreciation and co-operation, leading to an opening up of the region through the initiative of these young people.

It was the artists and these supporters from the cities who became actively engaged and helped the area after the Chuetsu Earthquake in 2004 and continuous heavy snowfall for two winters under the "Daichi no otetsudai" ("Help the Land") project, through activities such as reconstruction work and snow removal. Through such activities, it has become apparent that Echigo-Tsumari has become a place for hope for those living in the cities. Young people as well as those with more experience are jointly participating in building a "new hometown".

• As a new model for building community:

The way Echigo-Tsumari has pursued community building has been acknowledged beyond the framework of art, including the "Furusato Event Award" (by the Ministry of Internal Affairs)"; the "Tokyo Creation Award"; and the "Machitsukuri Commendation by the General Affairs Minister". This approach to community building through culture and art has drawn great attention as a type of "creative city", and Echigo-Tsumari has influenced other community building projects in similar art festivals in Tokushima, Ibaraki, Niigata, Osaka, and Setouchi [ETEC, 2019].

ETAT is one of the largest art festivals in the world and has been held once every three years in the Echigo-Tsumari region since 2000. The triennale provides an opportunity to present projects and initiatives developed in the Echigo-Tsumari Art Field. These projects aim to reveal existing assets of the region using art as a catalyst, rediscover their values, communicate these to the world and find a way to revitalize the region. Basically, these contents can be summarized as following:

· Festival:

In addition to the triennale itself, visitors can enjoy the Summer Festival ("Daichi-no-matsuri") and the winter "Snow Art Project", which coincide with local festivals and traditional events throughout the year. The "Daichi-no-matsuri" takes place in the years between the triennale, welcoming visitors and opening artworks to the public.

• Events and performances:

Performances and entertainment from all over the world are presented on the unique stage of Echigo-Tsumari, set amongst artworks and terraced rice fields. Visitors can enjoy local expressions and entertainments [ETEC, 2019].

· Learn and play

Major facilities such as Matsudai Nohbutai and Kyororo and artworks in unoccupied houses and closed school facilities offer public programmes, and provide opportunity for learning and experiencing about the local life, culture, and science throughout the year. Training programmes can be organized for schools and companies.

Table 1 summarizes the first to sixth ETAT during 2000-2015. As can be seen from this data, the number of artworks and the number of artists groups as well as local communities participating in the ETAT have increased significantly each

Table 1: Summary of ETAT during 2000-2015

Year	Profile		
2000 1st	Number of artwork: 153 Community engaging in exhibition: 28 Artist: 148 groups from 32 countries.		
2003 2nd	Number of artwork: 220 Community engaging in exhibition: 38 Artist: 157 groups from 23 countries.		
2006 3rd	Number of artwork: 334 Community engaging in exhibition: 67 Artist: 225 groups from 40 countries.		
2009 4th	Number of artwork: 365 Community engaging in exhibition: 92 Artist: 350 groups from 40 countries.		
2012 5th	Number of artwork: 367 Community engaging in exhibition: 102 Artist: 310 groups from 44 countries.		
2015 6th	Number of artwork: 380 Community engaging in exhibition: 102 Artist: 350 groups from 35 countries.		

time, and the evolvement of ETAT has been steadily progressing. Actually, there are 21 major exhibition facilities for artworks in ETAT and 14 of which are closed schools, which means that closed schools are an important part of the art festival. These closed school facilities might be considered as one of the most important resources other than artworks in ETEC. In each of these facilities, important experience and implication about AORC of the closed school facility are entered. Due on this situation, ETAC is considered an important case for analyzing and understanding the concept and approach of AORC of closed school facilities.

3. Outline of this paper

3.1 Research purpose

The purpose of this paper is to clarify the effect of art-oriented re-utilization and conversion of closed school facilities for the promotion of rural tourism by analysing the representative case of ETAT of Niigata Prefecture, Japan.

3.2 Research methods

This paper conducted the survey by the following two methods. The details are summarized in Table 2:

- Field research based on site survey: Picking up the ETAT, this paper focuses on each project of AORC-based closed school facility in ETAT. In such a sense, site survey by visiting each facility is an important approach. This paper collects the details including previous reports from ETEC to realize the basic situation and operates field research to observe and record the real condition of ETAT by several times of site survey during 2015-2016 (see Table 2).
- In-depth interview: in-depth interview was mainly operated in Aug. 2015 during the period of ETAT. We interviewed several different actors who are involved with the ETAT including the director and staff of ETEC, artists, local people and officers of the public sector. Our interview focuses on

Table 2: Summary of main survey by this paper

Site survey		
1 27th July-8th August 2015 (14 closed school facilities and 30 other art projects)		
2 22th-23th August 2015 (14 closed school facilities)		
3 19th-25th September 2015 (6 closed school facilities)		
4 14th-20th January 2016 (7 closed school facilities)		
In-depth interview		
ETEC Staff	General director, Mr. K, Project director, Mr. (2times, 3hrs), Staff, Ms. M, Mr. S, NPO directo Mr. W	
Artist	Mr. L, Mr. C, Mr. H, Y, Mr. L	
Local people	Mr. O (local NPO), M (Tokamachi's committee) T(leader of A community), I (local café owner)	
Public sector	Mr. O, K (member of local assembly), Mr. O(section chief, Tsunan Town office)	

their involvement in ETAT, and their interaction with other actors (organization or individuals).

4. AORC of closed school facility in ETAT 4.1 AORC of closed school facility projects

As mentioned above that closed schools are increasing in local municipalities due to the decreasing birth-rate and aging population in Japan. Especially in the case of Niigata Prefecture, due to rapid ageing and depopulation, as a result of the Chuetsu Earthquake, houses which have been the core to the local culture or schools which have been the center of the community have become vacant and on the increase (see Table 3).

There have been almost 100 projects involving individuals, schools, cultural institutions and corporations from 2006. Ubusuna House runs an event to enjoy freshly harvested rice and the tea ceremony, whereas picking up morning glory at "The Day After Tomorrow News Paper Cultural Department" (2003) has become a regular event of the local village. There are other local rituals such as summer festivals, harvest festivals and the New Year ceremony, and we have been enjoying an engagement with the region involving artists, Kohebi members (volunteers from outside the community), local supporters (volunteers from the community) as well as visitors from elsewhere.

Today, there are 14 closed school facilities (projects) constructed from 2000 to 2015. As Figure 1 shows, 12 of them are located in Tokamachi City, and 2 of them in Tsunan Town. Each of them has different features and functions. The details

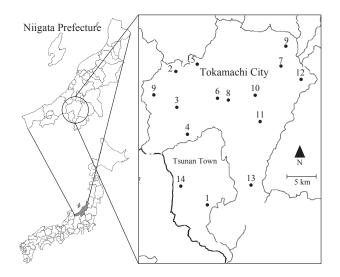


Figure 1: Location of closed school facility projects

of each facility are summarized in Table 4 according to the survey and analysis. Taking the Echigo Tsumari Kamigo Clove Theater (ETKCT) as an example, by introducing various spatial functions utilizing the layout of the existing closed school facilities flexibly, it is possible to regenerate the facility to meet the demand of the ETAT by an AORC approach (Figure 2).

4.2 Organizations engaging in AORC of closed school facility projects

Basically, these facilities are managed and operated by the staff of ETEC directly, however, detailed division of roles between several organizations exist.

First, NPO Echigo-Tsumari Satoyama Cooperative Organization (called ETSCO below) is an important partner for the operation and management of each closed school facility (project). ETSCO was established in 2008 in order to maintain and run artworks and projects created from festivals to rebuild the region. They foster a network of people in different backgrounds, generations and genre through festivals and pass on such a network to the future. Their goal includes: (1) locals live happily, (2) more places to work in the region, and (3) becoming a region where people with different sets of values can exist. Besides, Kohebi members as well as local supporters are also involved in the operation of each closed school facility.

Art Front Gallery (AGF) is a company related to art in general. Fulham Kitagawa (also the general director of ETAT) is the representative and conducts exhibitions and events mainly targeting on contemporary art, and community development such as the ETAT and the Setouchi International Art Festival, and planning and operation of public art, museums and cultural facilities [Art Front Gallery, 2020]. AGF has played an important role since the beginning of ETAT.

The brief image of operation of cooperation between each organization engaging in the AORC of closed school facility projects might be summarized as in Figure 3.

4.3 The planning and operation process of AORC of closed school facility projects in ETAT

The process of the planning and operation process of AORC might be summarized as follows according to interview surveys.

 Planning and selection of target: To list and select closed school facilities to be used in cooperation with ETEC and ETSCO, including Tokamachi City, Tsunan Town, and AFG.

Table 3: Transition of number of closed school facility and remaining school

Period Schools		1950-60s	1970s	1980s	1990s	2000s	total	Remaining
Tokamachi City	Elementary school	6	11	12	5	17	51	19
	Junior high school	6	11	4	1	0	22	10
Tsunan Town	Elementary school	7	6	6	1	4	24	4
	Junior high school	2	2	0	0	1	5	1

Table 4: Summary	of each closed scho	ool facility projec	ts in FTAT (Location of each	project see Figure 1)
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Project name	Location and community	Contents and feature	Closed/revitalized year
Katakuri house	Ketto community, Tsunan Town.	2F/wooden facility; Guest house (7	1992/2009
1. Ratakuri nouse	56 people/25 households	rooms), gallery	Managed by ETSCO
2. Day After Tomorrow News-	Azamihira community, Tokamachi City.	2F/wooden facility; Artworks, gal-	1992/2003
paper Cultural Department	158 people/63 households	lery, community center	Managed by artist
3. Sansho house	Sansho community, Tokamachi City.	3F/RC facility; Guest house (6	1989/2006
5. Sansno nouse	158 people/68 households	rooms), refectory, gallery	Managed by ETSCO
4. The Last Class	Higashigawa community, Tokamachi City.	2E/DC for ilitary Automobile11	1988/2006
4. The Last Class	27 people/64 households	3F/RC facility; Artworks, gallery	Managed by ETSCO
5. Center for Interlocal Art	Shimizu community, Tokamachi City.	3F/RC facility; Artworks, library,	2003/2009
Network	25 people/14 households	multi-function room	Managed by ETSCO
6. Museum of Picture Book	Hachi community, Tokamachi City.	2F/wooden facility; Artworks, gal-	2005/2009
Art	174 people/60 households	lery	Managed by ETEC
7 V1-i	Karekimata community, Tokamachi City.	2F/wooden facility; Artworks, gal-	2006/2009
7. Karekimata Project	35 people/10households	lery	Managed by ETEC
8. Asia photography and im-	Nagayama community, Tokamachi City.	3F/RC facility; Artworks, gallery	2001/2012
age center	104 people/41 households	5F/RC facility, Artworks, gathery	Managed by ETEC
9. NUNAGAWA Campus	Murono community, Tokamachi City.	3F/RC facility; Artworks, gallery,	2014/2015
9. NUNAGAWA Campus	288 people/110 households	café	Managed by ETSCO
10. Soil museum	Sukano community, Tokamachi City.	3F/RC facility; Artworks, gallery	2009/2015
10. Son museum	86 people/22 households	317RC facility, Artworks, gallery	Managed by ETEC
11. AKAKURAN	Akakura community, Tokamachi City.	2E/DC facility, Autyroda	2003/2015
II. AKAKUKAN	40 people/8 households	2F/RC facility; Artworks	Managed by ETEC
12 Commin Project	Kakuma community, Tokamachi City.	2E/DC for ilitary Automatic and account	2005/2015
12. Carry-in-Project	27 people/6 households	3F/RC facility; Artworks, art event	Managed by ETEC
13. Kiyotsu Warehouse Mu-	Kakuma community, Tokamachi City.	2E/DC facility, Autyroules, c-11	2009/2015
seum	62 people/20 households	3F/RC facility; Artworks, gallery	Managed by ETEC
14. Echigo Tsumari Kamigo Clove Theatre	ri Kamigo Miyanohara community, Tsunan Town. 97 people/36 households 3F/RC facility; Grooms), multi-fun works, gallery, at		2012/2015 Managed by ETSCO

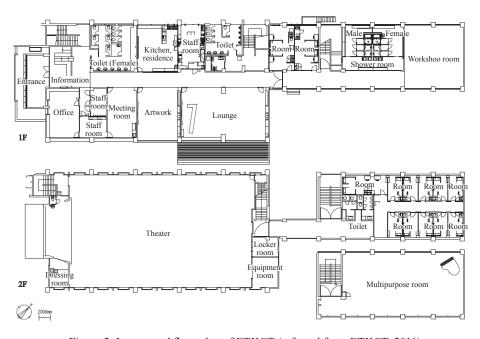


Figure 2: Layout and floor plan of ETKCT (referred from ETKCT, 2016)

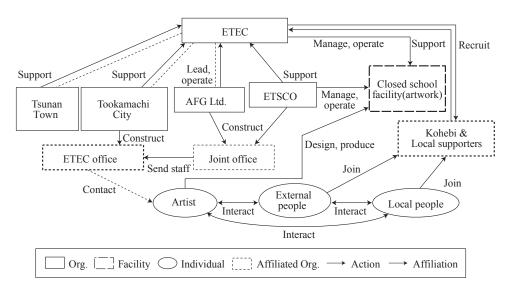


Figure 3: Operation model of closed school facility

- Decision on policy to use closed schools: "Contribution to local residents" as a prerequisite for participating artists, and as a concept of the art festival, artists "learned and deepened their understanding of the land and area." To create an idea obtained from the land as a work was decided in collaboration with ETEC and ETSCO. Of course, the installation of works on private land such as rice fields etc. The basic understanding of "making things" and communication, understanding, and cooperation with local settlements are determined as prerequisites.
- Contents of utilization of closed schools and recruitment and selection of creators: Artists are required to participate in the arts festival after understanding the prerequisite to "work in collaboration with local residents" at the stage of recruitment. In particular, artists that interviewed villages that would like to set up works before the call for work, and requests and issues to be solved from the community, disclosed such information when soliciting, and applied for a work plan that responded to those requests and issues. There is also a stage to ask the house in advance.
- Closed school utilization facilities and work production: In the production of works, it is hoped that artists and local settlements will work together to stimulate each other and rediscover the charm of the region. Actually, local residents and Kohebi are used as helpers from the stage of maintenance and production.
- Operation of closed school utilization facilities: The ownership of closed school facilities remains in Tokamachi City and Tsunan Town (both of the Board of Education) after the development, but during the operation period, the facility managers ETEC and ETSCO will borrow them. The site is operated in collaboration with local residents and Kohebi.

After the planning, the operation model of the closed school facility in ETAT can be shown as in Figure 2. These closed school facilities (artworks) are produced by artists. ETAT is

funded by AFG Ltd., Tokamachi City and Tsunan Town jointly. ESTCO works as co-worker and supporter of ETEC. The operation of the closed school facility is promoted mainly by ETEC and some of them are by ETSCO with the support of Kohebi and local supporters.

The overall planning and operation process of AORC of closed school facility projects in ETAT as mentioned above might be concluded as in Figure 4.

4.4 Effect of AORC of closed school facility projects in ETAT

First, the effect of AORC of closed school facility projects might be certified from the main outcomes of ETAT. Focus on the past three times of ETAT, the number of visitors and the number of registered volunteers of the art festival volunteer organization, Kanebi, have shown a stable growth trend in terms of the results of each year. They increased from 162,800 and 800 in 2000 to 510,690 and 3,424, respectively, and grew 3.1 times and 4.3 times, respectively (upper part of Table 5).

Regarding information dissemination and economic effects (middle part of Table 4), the number of news reports in Japan and overseas (lower part of Table 4), as well as the economic ripple effect on the local region, increased from 140 and 3,560 (million yen) in 2009 to 803 and 5,089 (million yen) in 2015, respectively, indicating a strong growth trend. In particular, the degree of attention overseas is great.

5. Conclusion

This paper summarized the features and analyzed the operation model of closed school facility projects in ETAT based on analysis.

Various kinds and functions which are input into the closed school facility projects through the AORC approach were discovered from the case studies and, thus, bring new possibilities for the local community especially in the rural area.

The operation of closed school facilities is carried out by multi-actors. The strong linkage and cooperation between them

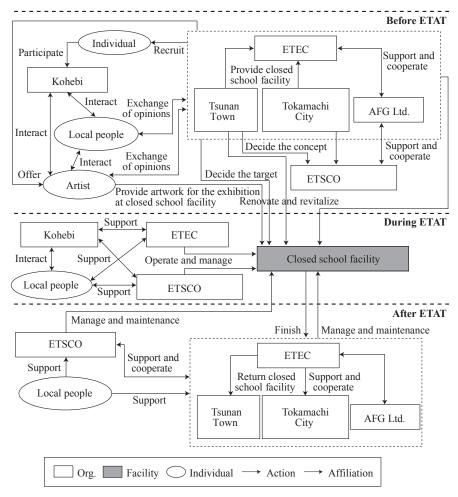


Figure 4: Overall planning and operation process of AORC of closed school facility projects in ETAT

Table 5: Summary of main outcomes of ETAT

Year	Number of participants
2000	162,800 visitors, 800 volunteers (Kohebi)
2003	205,100 visitors, 711 volunteers (Kohebi)
2006	348,997 visitors, 930 volunteers (Kohebi)
2009	375,311 visitors, 350 volunteers (Kohebi)
2012	488,848 visitors, 1,246 volunteers (Kohebi)
2015	510,690 visitors, 3,424 volunteers (Kohebi)
Year	Economic ripple effect
2009	3,560 (million yen)
2012	4,650 (million yen), growth rate: 131 %
2015	5,089 (million yen), growth rate: 109 %
Year	Amount of media report
2009	140 reports (including 20 reports from overseas media)
2012	552 reports (including 27 reports from overseas media)
2015	803 reports (including 97 reports from overseas media)

is essential. This kind of model not only realizes an effective operation and management of facilities but also creates active interaction and exchange between each actor including municipalities, NGO, companies, local people, artists and external people.

The case of ETAT provides us with a new model and possibility for the AORC of closed school facilities in rural areas. This kind of model is expected to bring more success and vitality to those local rural communities which are facing issues such as decreasing birth-rate, aging population and economic decline.

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References

Art Front Gallery (2020). About Art Front Gallery, http://www.artfrontgallery.com/. (accessed on 2020/1/25)

Echigo-Tsumari Executive Committee (2019). About triennale, http://www.echigo-tsumari.jp/eng/about/. (accessed on 2020/1/25)

Echigo Tsumari Kamigo Clove Theatre (2016). Facilities, http://clove-theatre.jp/. (accessed on 2020/1/28)

Fujino, A., Aizawa, H., and Sugawara, M. (2010). The cause of public elementary schools closing down and the subjects of them. *Journal of Architecture and Planning*, Vol. 75, No.

- 649, 579-585.
- Gon, A. (2016). Public space and public art: Utilization of shut down school for art space. Bulletin of the College of Community and Human Services Rikkyo (St.Paull's) University, Vol. 18, 41-55.
- Ministry of Land, Infrastructure, Transport and Tourism (2010). Maintenance and renewal of social capital, http://www.mlit.go.jp/hakusyo/mlit/h23/hakusho/h24/html/n1216000.html. (accessed on 2020/1/25)
- Nozawa, H., Taniguchi, G., Tsunekawa, K., and Tabata, E. (2012). A study on the feature of regions that have closed public schools and reuse: In case of Aichi, Gifu, and Mie prefecture. *Journal of Architecture and Planning*, Vol. 77, No. 674, 865-872.
- Saio, N. (2008). A study on the closing/integrated process of public elementary/junior high schools and on re-use of the school facilities: The actual situation of closing/integrated schools for the past 30 years in Ibaraki prefecture and its effects on the rural communities. *Journal of Architecture and Planning*, Vol. 73, No. 627, 1001-1006.
- Uwamori, S. and Tsutsumi, H. (2016). A study on setting of numerical targets for comprehensive management plan of public facilities and infrastructures. *Journal of Architecture* and Planning (Transactions of AIJ), Vol. 81, No. 727, 2011-2019. (in Japanese)
- Yamamoto, S., Nakazono, M., and Shimizu, S. (2012). Facility management of closed public schools: Survey report of closed educational facilities in Yamaguchi Prefecture. AIJ Journal of Technology and Design, Vol. 18, No. 38, 357-360.

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