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RIVER ENVIRONMENT EDUCATIONAL ACTIVITY IN A COOPERATIVE FRAMEWORK AIMED AT CREATION OF SATO KAWA

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ABSTRACT

This study examines consensus formation processes in the development of aquatic marine environmental education programs aimed at the creation of SATO-KAWA, bountiful rivers using aquatic life in the Hei River Basin after 3.11 Tsunami. Those processes are promoted primarily by local residents, as verified from "Project Design and Evaluation" viewpoints. Aquatic marine environmental education programs are discussed based on consensus formation. From the discussion, the following ideas for four programs were proposed: (1) Exploration of the riverhead of the Hei River flowing into Miyako Bay, which is close to the riverhead of Yanagawa River flowing into Morioka; (2) Appreciation of the Cherry salmon video images; (3) Understanding of the fish-eating culture in the Hei River Basin while tasting Cherry salmon caught in the Hei River Basin; and (4) Setting a scene for talking about Cherry salmon to reinforce recognition of Cherry salmon.

INTRODUCTION

Supported by local residents of Miyako City, Iwate Prefecture, which was damaged by seismic surges, Hei River Educational Academy (established in 2008) resumed activities from September 2011. The academy provided an "Aquatic Marine Environmental Education program" that has been highly evaluated by pupils and their parents (Sasaki et al., 2012), offering experimental learning about aquatic life, aquatic marine environments, and association with human beings, improving the aquatic marine environmental literacy of participants, and raising the consciousness of the people. However, the manner in which improvement of aquatic marine environmental literacy affects "Community capability" (ability to develop sustainably and spontaneously), and whether it causes tangible effects have not been verified sufficiently. Although the "Cooperative environment education" that is promoted by the region in an integrated manner is cited (Ministry of Environment, Japan, 2005), formation of a consensus is still being sought and establishment and promulgation for methods for development, practice, and assessment of aquatic marine environmental education program remain incomplete (NOAA, 2008).

Herein, aquatic marine environmental literacy is explained. Aquatic marine environmental literacy describes a human capability by which, based on the learning cycle theory (Sasaki, 2011a), one can "Observe familiar aquatic marine environments scientifically, discuss various problems cooperatively, comprehend aquatic marine environments' basic principles consisting of 66 items in 8 categories (scientific cognition, linkage of forests, rivers and seas, properties of water, understanding of fish-eating culture, and others), make responsible decisions and take action, and convey them to others. These human beings are defined as "Aquatic marine environmentally literate" people. Aquatic marine environmental education programs aim at nurturing "Aquatic marine environmental literacy" human resources, and support learners so that they themselves can develop through each stage of observing, thinking, and understanding aquatic marine environments, making decision and taking actions (Sasaki, 2011a). It is considered that if aquatic marine

environmental literacy were acquired, one could correctly understand aquatic marine environments including river basins and ocean areas, capabilities of using regional resources such as nature, scenery, aquatic life and others at a maximum, and developing it sustainably and spontaneously. "Community capability" is enhanced, as are the spirit of human dignity and the doctrine of mutual assistance. These might result in cultivation of the disaster prevention consciousness through regional cooperation, reconstructive capability to achieve earthquake disaster reconstruction, and disaster prevention and reconstruction power as long-term outcomes (Sasaki 2011b; Spranger, 2010). As stated, a state in which human resources with aquatic marine environmental literacy use nature, scenery, aquatic life, and others at a maximum and in which the entire river basin tends to develop sustainably and spontaneously through respect from human beings and mutual assistance while coexisting with nature is defined by the creation of rivers with which nearby populated areas can coexist (Creation of SATO-KAWA, a bountiful river).

This study examines consensus formation processes in the development of aquatic marine environmental education programs aimed at the creation of SATO-KAWA using aquatic life in the Hei River Basin. Those processes are promoted primarily by local residents, as verified from "Project Design and Evaluation" viewpoints. Aquatic marine environmental education programs are discussed based on consensus formation.

METHODS

To illustrate the development of an aquatic marine environmental education program aimed at creation of SATO-KAWA based on consensus formation, the Hei River flowing through Miyako City, Iwate Prefecture is selected as the object of analysis. Creation of SATO-KAWA produces a state in which humans with aquatic marine environmental literacy coexist with river environments, use regional resources such as scenery and aquatic life to the maximum degree and the entire river basin develops sustainably and spontaneously with a spirit of human dignity and mutual assistance. The aquatic marine environmental education program targets the river basin and surrounding inhabitants, who share concerns of the Hei River in an integrated manner and who take action to realize creation of SATO-KAWA aimed at maximization of the Hei River value.

The headwaters of the Hei River are at Kabuto-myojin-dake (1,005 m elevation) located at Kuzakai plateau in the central Kitakami mountainous area. The 75.7 km Hei River, a class B river winding along National Route 106 and flowing into Miyako Bay, has more than 200 small and large tributaries, as well as Yakushi River flowing from Mount Hayachine (1,993 m elevation). In the river, fishes of 58 types have been identified (Sasaki, 2004); it has class 5 common fishery rights. The fishery right fish species are Japanese trout, landlocked salmon, mountain trout, Japanese dace, and others, most of which are wide-ranging fish that are deeply related with the sea.

In this study, specific fish were selected from those fish species. Then, aquatic marine environmental education programs aimed at creation of SATO-KAWA were developed through the years. Regarding development of the program, based on Project Design and Evaluation (NOAA, 2008), Hei River Basin inhabitants became program promoters and participants, with citizens of adjoining Morioka City using a "Workshop" style. Assessment of the ADDIE model (described later) was applied to the "Workshop", which was held monthly from December 2012 through December 2013. Using results produced by the workshop, an aquatic marine environmental education program was developed and performed in May, September, November, and December. This paper describes the "Cherry salmon summit" aquatic marine environmental education program held in May.

The NOAA Coastal Services Center (USA) developed PDE. An agent of the Sea Grant college extension uses PDE when planning, designing, and evaluating social contribution activities for regional development and regional education (NOAA, 2008). One mission of the Sea Grant college extension is the support of activities that make a social contribution and are requested by the federal government such that an impact of the social contribution can be evaluated appropriately (NOAA, 2008). For this study, a workshop by regional residents is held by application of the Assessment, Design, Development, Implementation, and Evaluation (ADDIE) model in accordance with the PDE concept. Then an aquatic marine environmental education program is compiled. The ADDIE model executes development, execution and assessment of the program. SMART is used when a target is determined and shared. A LOGIC model is a means for substantiating the logical structure and for bringing measures to a successful conclusion.

When participants such as a sponsor (local government), local residents, and stakeholders carry out cooperative activities such as environmental preservation, the ADDIE model is used for development of a program that ensures the best effects and practices of the program. A series of cycle of Assessment, Design, Development, Implementation, and Evaluation is followed, with each step executed one by one. Then improvement is made as necessary to accomplish the best target finally. Assessment is done by a systemic survey to identify aspects of knowledge, technology, interests, attitudes, and capabilities of individuals in the target group for a specific issue. Then analysis is made for the following 12 items: (1) to identify object persons and problem areas, (2) to form a project team, (3) to retrieve information and literature, (4) to characterize object persons, (5) to establish goals and objects of needs assessment, (6) to select data collection methods and to create questions, (7) to determine a sampling plan of the target cluster, (8) to design data collection methods and to execute them in trials, (9) to collect and record data, (10) to analyze data, (11) to manage data, and (12) to summarize information and prepare reports.

In this study, local residents are targeted as (1). Project members of (2) are recruited from Miyako City, where the Hei River is flowing and adjoining Morioka City (consuming region) and a team is formed. The executive committee is held as (7) to execute (3)–(6). Then (9)–(12) are executed for the examination.

RESULTS

Results of the workshop corresponding to the ADDIE model are presented below

(1) Identification of the object and problem area

Huge seismic surges occurred off the eastern Japan Pacific coast on the afternoon of March 11, 2011. Many lives and assets were lost because of the tsunami, with heavy damage to local fishery industries including fishing harbors and vessels. Unloading of fishery products was halted. Since then, many parties related to marine products industries including fishery operators, fishery processing parties, and retailers have desperately strived to pursue recovery and reconstruction activities in the midst of such difficulties. As of 2013, shipment values of the Miyako fish market recovered to 80–90% of the level preceding the disaster (Ministry of Fisheries, Japan, 2014).

Oyster farming facilities in Miyako Bay were damaged catastrophically. The union was not sure of its restoration. They removed wreckage and accomplished the reinstallation of longlines. Finally, they had a clear picture of restoration in August. An oyster ownership system was established. Oyster breeding was suspended using assistance granting funding, and recovery was completed with excellent results in March 2012. They managed to achieve such a situation in which owners surveyed the fishing place and oysters that had just been harvested were presented. Direct sales of oysters improved the profit rate as compared with conventional indirect sales via prefectural associated fishery. In the next fiscal year, using the “Ganbaru fishery restoration support system” (Ministry of Fisheries, Japan, 2014), oysters were brought up to large size. Two-year-old Japanese oysters grown to substantial size were traded at ¥ 20,000 per 10 kg.

However, in addition to natural disasters, these disaster conditions created immense burdens for the future by the human disaster of the nuclear plant accident in the region. A big problem for everyone associated with fisheries is harmful rumors. The damage caused by the rumors is immense. In the spring of 2013, prices of brown seaweed were half those of 2012 (Kainou, 2013).

Such price erosion presents a severe problem that cannot be resolved by fishery-related parties alone. All natural fishery products landed in Miyako City, Iwate Prefecture are inspected. Only those qualified according to the safety standards are shipped. No radioactive contents exceeding the criterion level were detected in fishery products from Miyako Bay (Iwate Prefecture, 2014). Nevertheless, sales of fishery products are weak. These circumstances persist because of several factors, in addition to insufficient exchange of risk communications between the national and local governments, the utterances of researchers have fostered aversive behavior of consumers based on their opinions. Those researchers have ignored detailed surveys, but have stated that fish from the Tohoku district’s Pacific coast should be avoided.

As one measure against harmful rumors, the author regarded an aquatic marine environmental education program sponsored by local residents as necessary to promote understanding of aquatic life in the production area targeting general citizens. The final target of aquatic marine environmental education

programs is the development and practice of experimental programs in the place of production and to cause consumers to reawaken to the safety of aquatic life, where promotion of understanding of aquatic life in the production area is used as the main theme.

Furthermore, aquatic marine environmental education program is not a one-way program promoted by the sponsor. It should be undertaken as a bidirectional program with participation by the sponsor and participants and should be developed and practiced by local governments, the fishery union, commercial cooperative corporation, local residents, and other producers.

Here, the author would like to clarify the definition of a "harmful rumor", which is an important theme. On a certain internet site (<http://www.mag2.com/magspe/interview148/>), one university professor commented that "Ocean fish, fungi, river fish, citrus and other sea organisms from northern Kanto to Tohoku district Pacific Ocean side are dangerous. Adults should be careful in selecting these foods for children." This comment might be intended to warn that foods from northern Kanto to Tohoku district Pacific Ocean side are dangerous and should not be given to children. However, for overly sensitive consumers now, this comment might be interpreted as meaning that ocean fish, fungi, river fish, citrus, and others from northern Kanto to Tohoku district are dangerous and should not be eaten. Moreover, the expression "northern Kanto to the Tohoku district Pacific coast" is too obscure. Furthermore, sensitive consumers might misunderstand that all information or opinion by a university professor is necessarily correct and that all foods from northern Kanto to Tohoku district Pacific coast are unacceptable, even those which have come from less-contaminated areas. Such information is noticed here and there on the internet.

A question arises of whether scientific data are conveyed reliably to consumers or not. This is also questionable. Iwate Prefecture takes measurements of radioactive substances in foods periodically requested by the government and makes it available to the public on a website (Iwate Prefecture, 2014b).

Nevertheless, the degree to which this information transmission is regarded seriously, believed, and used for determination of consumption behavior has not been investigated sufficiently.

As described, large information gaps persist in relation to radioactivity between the transmitting side and the receiving side. Harmful rumors are defined here by the fact that consumption activity is suppressed by a conceptual gap.

Based on the discussion presented above, it is considered that, from a risk communication viewpoint as one measure against harmful rumors, aquatic marine environmental education programs conducted through regional cooperation involving general citizens are necessary. A final target for the main theme must be set to develop and practice an experimental program and to induce consumers to reawaken to the safety of aquatic life while promoting understanding of aquatic life in fishery production areas.

(2) Formation of project team

As described previously, the ultimate target of this study is that river basin inhabitants tackle regional activation subjectively. Creation of a framework of support for this should therefore be made. The foundation for this is improvement of aquatic marine environmental literacy by aquatic marine environmental education program. Temporary tackling of the issue by firms that are not directly related to the region concerned and NPOs is not hopeful. The following opinion was presented at the social network. "The event sponsored by a large corporation held in 2012 certainly attracted many people. However, it failed to induce subsequent deployment despite attracting many people. It did not contribute to the sales of local shopping streets, either. After all, local people should be involved to boost the event." Nevertheless, concrete measures for raising morale were not presented. When asked "Do you have any concrete ideas?", The response was "Every region has its own treasure; if this treasure is consumed, we must find the next treasure. However, that next treasure has not been found yet. For example, after visiting a festival, we have no further place to go. Accordingly, the next enchanting experience should be created." When asked "How about creating 'a value' that can connect Miyako with Morioka?", many expressed their support. A project team was eventually launched by local residents.

Subsequently, members from Miyako and Morioka joined the project team. Participation of these members generated proposals that bring out their natural flavor. Members of the cooperative effort are neighborhood people involved in river activities such as the "Sanriku ESD Hei River Educational Academy," a citizen's group, and "Preserving Morioka Nakatsu River," an NPO in Morioka City. Table 1 shows the flow of activities up to that day (summit).

Table 1. Preliminary meetings.

Date	Meeting name	Contents	Number of staff participating	Place
January 20	First Morioka meeting	Future direction was confirmed.	Two	Tearoom "Chaton" in Morioka City
January 26	Miyako meeting	Various ideas were presented for a proposal that Hei River activities should be boosted to a wider area.	Four	Miyako City
February 16	Second Morioka meeting	Points of the Cherry salmon summit were explained to the attendees including the Morioka Nakatsu River party. People who have a particular feeling related to Cherry salmon introduced their experiences and expectations.	Five	Azumaya main store
March 3	Third Morioka meeting	Opinion "A theme other than Cherry salmon would be adequate" was presented.	Eight	Plaza "Odette"
March 10	Fourth Morioka meeting	Future direction was discussed. On this occasion, video images of Cherry salmon were presented. All attendees agreed to proceed with the Cherry salmon summit.	Six	Azumaya annex
April 6	First Morioka and Miyako joint meeting	The Cherry salmon summit was discussed.	Four	Miyako City
April 10	Start of Aquatic Marine Environmental Education Laboratory seminar	The Cherry salmon summit was put into a year-round schedule.	Ten	Tokyo University of Marine Science and Technology
April 18	General meeting of Preserving Nakatsu River party	Expectations of the Cherry salmon summit.		Plaza "Odette"
May 4	On-the-spot study	On-the-spot study. Walked from Youth Outdoor Learning Center until the Riverhead.	Two	Kuzakai plateau
May 18	Day of Cherry salmon summit	Execution of programs	Thirty	Kuzakai plateau

(3) Retrieval of information and literature and (4) Characterization of object persons

At the third Morioka meeting, a discussion was made mainly of concerns about holding a Cherry salmon

summit. The Cherry salmon is a symbol and treasure of the Hei River. In the Sanriku seacoast, the Cherry salmon swimming upstream in the Hei River are abundant. Anglers prefer this river. Members of the project team described that Cherry salmon are appropriate as the target.

At the third Morioka meeting, some participants worried that a theme dealing with Cherry salmon is inappropriate. Reasons for this opinion are that it is not specific to the Hei River. This species is found in other rivers. No specialization is found. Some attendees noted that "In the first place, why is the Cherry salmon summit held for the Hei River? Cherry salmon live in the Kitakami River, Omono River, and Akita Prefecture, so it is not a particularly rare fish species and lives in many areas naturally. Using a fish that can be found everywhere as a symbol is not recommended." This statement reflects the view that Cherry salmon also swims upstream in the Nakatsu River, so even swimming upstream is not specific to the Hei River. This comment might be given by anglers who enjoyed fishing around Morioka City for many years.

However, the number of Cherry salmon individuals is decreasing drastically nationwide, and areas of Cherry salmon resource distribution have been decreasing as well. For this reason, the Ministry of Environment designated this fish species as a semi-endangered species. In Yamaguchi, Hyogo, Fukui and Shimane Prefectures, it is designated as an endangered species. If this situation is viewed in reference to the time axis and space axis, then it is apparently in a critical situation. Although northern Tohoku district is blessed with Cherry salmon resources, reduction in resources is remarkable nationwide, as typically represented by Toyama Prefecture, where previous 165 ton fish catches decreased to as low as 1 tons. Even in northern Tohoku district, construction projects that discourage swimming upstream and deterioration of water quality environments are progressing. The situation of upstream swimming continues to worsen.

In addition, some have said that "In Miyako, Cherry salmon is a special fish in one sense." Therefore, diverse people with different opinions are involved with Cherry salmon. No mutual understanding has been advanced well. According to Mr. M, who loves the Hei River and who enjoys fishing as a hobby, "Some people take up the position that Cherry salmon is the target of catch-and-release, while others catch it for eating. Consequently, a conflict of opinions arises and adjustment is difficult." There is apparently a no-win situation around the river basin. Although Cherry salmon resources have been decreasing drastically in many rivers, people in the Kuzuryu River Basin, where abundant Cherry salmon lived earlier, are making concentrated efforts for resource protection. Fishery resources are still rich along the Sanriku seacoast, and Cherry salmon is an abundant fishery resource. People there recognize that eating it as food is quite natural.

As described above, a huge gap of understanding related to Cherry salmon by local residents prevails in Morioka and Miyako. Cherry salmon is extremely popular as a target of sport-fishing and also as a food resource. Many people are interested in this fish species.

(5) Establishment of goal of needs assessment and target

Based on this background, a topic of the fourth Morioka meeting was whether Cherry salmon should be adopted as a theme and, if adopted, what themes are adequate. Mr. T, who found video pictures of Cherry salmon on the internet, was in attendance. This video picture was taken by a camera operator of a local broadcast station so that everybody could see it. After the members shared this video picture, a certain common thought arose. Everybody came to regard the Cherry salmon as a valuable regional resource. Certainly, at this moment, their inhabitation is confirmed in the local area, but they are showing a decreasing trend nationwide. If swimming upstream is prevented and their egg-laying sites are lost because of artificial structures such as barrages, the depletion of Cherry salmon resources will be accelerated. Simultaneously, the possibility exists that a long historical and cultural relationship between human beings and Cherry salmon can be lost.

Furthermore, a topic presented by Mr. S, who gathered information at K-river upstream in N-prefecture, suggested that the theme should be Cherry salmon. K-river, a branch of the N River, famous for its abundant wellsprings and forests, is crucially important for its nearby residents. However, it was reported that the river status is not good by any means because of biomass power generation and a forest collapse in recent years. Mr. S remarked that "I returned to Morioka 20 years after I left, excited and encouraged to find that characteristics of the home are unchanged. I have to do something so that the home river might not be brought into the same kind of devastated state as I encountered at K-river." Upon hearing such an opinion by a member, consciousness of "We should do something now" was cultivated. This caused a strong driving power for holding the Cherry salmon summit.

This conversation took place in Morioka. Results of discussions in Morioka were released in Miyako. On the following day, discussion with members of the Hei River educational academy was made also in Miyako. This discussion produced such conclusions that the "Summit should be held using Cherry salmon as the theme and next theme should be sought. Cherry salmon is a valuable fishery resource for the local area. Although such an activity linking Miyako with Morioka has not been realized to date, we would like to promote the preservation and protection of river environments and to tackle enlightenment activities while deepening mutual understanding through the planned summit." Based on these conclusions, it was determined that a detailed schedule and contents should be set.

DISCUSSION

According to this conversation, "Kuzakai plateau", a contact point between Morioka and Miyako, was set as the site and riverhead exploration of Yanagawa and the Hei River was selected as the activity to be promoted. The riverhead of Yanagawa, where dam construction is being planned and the riverhead of the Hei River Basin targeted currently starts from almost the same place. Although it seems that the Cherry salmon and riverhead have no mutual connection on the surface, the intention implanted here is to ascertain their possible linkage by understanding the riverhead.

Next, contents of the summit were determined in detail. After each member obtained a video picture, we were able to understand the biology of Cherry salmon for the first time ever and to understand that a river free from damming from the riverhead to the mouth is necessary. Some members proposed that this video image should absolutely be shared by participants. The video image has a great impact. The local NHK broadcast station planned this and put it on TV in 2010 under the title of "Natural heritage of Iwate Prefecture". This program was listed on the website known as eco-studio. Comments presented by the members came down to this one point of sharing of the video picture with a cameraman. "This is very valuable picture. Taking such a picture is not simple at all. I would like to invite the cameraman here and hear his fresh voice explaining how and why he came to take such a picture." "Pictures showing swimming upstream in the river and egg laying conditions are important for understanding of the river." "Cherry salmon is a treasured fish and we can see them only very rarely. I would like to share it with participants." Upon receiving such proposals, it was finally decided that we should invite his attendance and listen to his commentary.

The next stage is dietary education activity in which Cherry salmon is actually cooked and we taste it. Japanese people have a long history as a fish eating culture. Fish have remained an important food since before recorded history. Particularly, Cherry salmon swim upstream in the Hei River. They have been highly valued from old days as an important protein source from spring until summer. From such a context, a desire for enjoying Cherry salmon taste sprang up among participants. Mr T, who has been enjoying Cherry salmon fishing for long years has said that "Cherry salmon is delicious when they came to the river. More delicious than fish caught in the sea. Fat that is put on Cherry salmon is entirely different from that of other fishes." Several opinions were presented for the cooking of Cherry salmon. Some said that fish cooked in Morioka should be brought. The conclusion reached is that fresh and good looking Cherry salmon caught on the day should be cleaned on-site by fish store owners, grilled with charcoal, and served up. At the beginning, some said that it should be cut and trimmed by staff members. We thought that demonstration of cutting and trimming by the owner of local fish store will be impactful and that it might provide incentives for fish cooking to participants in the current modern society where fish are gradually being abandoned. It is said that Cherry salmon at this point put on fat well and those reached upstream are extremely tasteful. In fact, they are caught scarcely. Members wished all participants should taste Cherry salmon of scarcity value.

Another attention point is to provide a scene in which participants hold conversations with each other about Cherry salmon. As seen in the video picture during information collection by the cameraman, Cherry salmon is an extremely valuable protein source for people living upper stream. The swimming upstream of Cherry salmon was visible in the Hei River Basin as well as the Kitakami River, and the capture of Cherry salmon reached upstream was one pleasure of local residents. Mr. S, who grew up upstream of Yanagawa, shared amusing memories of catching Cherry salmon during childhood. People in the Kadoma area lived while catching Cherry salmon. Mr. S, living in Kawauchi district and over 90 years old now, spoke of an event of 80 years ago as though it were yesterday. "Cherry salmon came here and jumped at Kanioka

falls. My uncle caught one using a fishnet. I clearly recall that instance and I was greatly impressed." For people living upstream, Cherry salmon used to be an important protein source. Moreover, one reason they stayed there is the Cherry salmon. In addition to mere foodstuffs, Cherry salmon is an important factor for feeling an attachment to nature such as being involved with the Hei River pleasantly together with familiar people, having a feeling of gratitude for the Hei River, and feeling awe for the mountain. For river basin residents, association with Cherry salmon might be a motive to continue to live there. For local people and children, swimming upstream of "Cherry salmon" would have been a valuable treasure uplifting their spirits. We would like to share together episodes of appreciation of the Hei River's treasure and living there, while tasting Cherry salmon. We thought that such attempts might reconfirm the feeling of local residents for Cherry salmon, and that this feeling might be felt by pupils who attended thereby, deepening the recognition of Cherry salmon.

From the discussion presented above, the following ideas for four programs were proposed: (1) Exploration of the riverhead of the Hei River flowing into Miyako Bay, which is close to the riverhead of Yanagawa River flowing into Morioka; (2) Appreciation of the Cherry salmon video images; (3) Understanding of the fish-eating culture in the Hei River Basin while tasting Cherry salmon caught in the Hei River Basin; and (4) Setting a scene for talking about Cherry salmon to reinforce recognition of Cherry salmon. Table 2 shows the overall schedule chosen based on discussions described above.

Table 2. Overall schedule decided.

1 Time and date	May 18, 2013 (Saturday) 9:00–14:00
2 Place	Kuzakai Plateau walking center
3 Participants	30 pairs of grade schoolchildren and guardians
4 Food expense	¥ 500/pair
5 Items to bring	Boots, towel, rice ball
6 Application accepted at	Name, address, and telephone number of the participant should be mailed to the Cherry Salmon Summit Planning Committee secretariat
7 Schedule	9:00 Reception 9:30 Riverhead exploration (Hei River riverhead) 11:00 Screening "River where Cherry salmon swimming upstream" (Guest: K. Yanagisawa, NHK cameraman) 12:00 Let's taste precious Cherry salmon caught in the Hei River 13:00 Let's talk actively 14:00 Closing

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REFERENCES

- Iwate Prefecture. (2014). *Results of radioactive ingredient test about fisheries products*. Retrieved from <http://www.pref.iwate.jp/houshasen/torikumi> (in Japanese)
- Sasaki, T. (2011). *The theory and practice of Japanese aquatic marine environmental education*. Tokyo: Seizando Shoten. (in Japanese)
- Sasaki, T. (2004). *Research of resource biology of Wakasagi Hypomesus nipponensis in the Hei river*. Tokyo: The Doctoral Thesis, Graduate School of Tokyo University of Fisheries.
- Sasaki, T. (2011b). Engagement of the Hei River academy educational program: "Let's investigate, think and act for children's tomorrow after 3.11 Tsunami." *Sanriku Eco Vision Forum, 2011*, 8–12. (in Japanese)
- Sasaki, T., Ito, A., Hirayama, K., Uchida, N., Saito, N., Oyama, T., Mizuki, T., Yoshida, T., Nagahora, T., & Sato, R. (2012). *Are children hesitating to think ocean after 3.11 Tsunami in Sanriku, Northern Japan?* Anchorage, USA: National Marine Educators Association Conference.

- Kainou, K. (2013). *Quantitative judgment and evaluation in regarding of harmful rumor of agricultural products associating Fukushima plant crisis*. Tokyo: The Research Institute of Economy, Trade and Industry. 110pp. (in Japanese)
- Ministry of Environment, Japan. (2012). *Law regarding of environmental protect action, environmental education promoting*. Retrieved from https://edu.env.go.jp/files/co_2012.pdf (in Japanese)
- Ministry of Fisheries, Japan. (2014). *Actual condition and problem for fisheries reconstruction*. Retrieved from <http://www.jfa.maff.go.jp/j/yosan/23/pdf/kadaigenjou0305.pdf> (in Japanese)
- Mike Spranger. (2010). Community development and Ocean Literacy education in the U.S. *Memoirs of Study in Aquatic and Marine Environmental Education*, 3(1), 93–99. Retrieved from <http://oacis.lib.kaiyodai.ac.jp/dspace/bitstream/123456789/1083/4/AA12321630-3-1-93.pdf> (in Japanese)
- The National Oceanic and Atmospheric Administration (NOAA). (2008). *Project design and evaluation*. Charleston, SC: NOAA Coastal Services. Retrieved from <http://coast.noaa.gov/digitalcoast/training/project-design>