



International Exchange Programmes
between Japan and other UNESCO Member
States for the Promotion of International
Cooperation and Mutual Understanding

2007 University Student Exchange Programme

Practical Eco-tourism
for the Education of Sustainable Development

9 – 25 March 2008
Fiji and Tuvalu



Programme organisers

Saga University

Asia/Pacific Cultural Centre for UNESCO (ACCU)

In Cooperation with

Fiji The University of The South Pacific (USP)

Fiji National Commission for UNESCO

Tuvalu Tuvalu Government

Tuvalu National Commission for UNESCO

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TABLE OF CONTENTS

I. Programme Information	
1. Introduction	1
2. Objectives of the Programme	2
3. Delivery of the Programme	3
4. Expected Results of the Programme	4
5. In Advance Orientation	5
6. Follow-up Activities / Plans of the Programme	6
II. Proceedings	
09/March Day 1	8
10/March Day 2	8
11/March Day 3	8
12/March Day 4	14
13/March Day 5	25
14/March Day 6	33
15/March Day 7	36
16/March Day 8	41
17/March Day 9	41
18/March Day 10	46
19/March Day 11	60
20/March Day 12	69
21/March Day 13	78
22/March Day 14	78
23/March Day 15	92
24/March Day 16	93
25/March Day 17	93

III. Wrap-up Session Speeches in Tuvalu	94
IV. Outcomes and Future Plans	105
V. Students' Impressions in this tour	109
VI. Comments and Suggestions	
1. Comments to ACCU	127
2. Comments to UNESCO	127
3. Evaluation of the Tour (by Saga University).....	128
4. Suggestions to ACCU.....	129
5. Final Words from the Escorts.....	129
VII. Reference List	130
VIII. Annex	
1. Programme Schedule	132
2. List of Participants	137
3. From the Students' Evaluation Form	138
4. Collaborating Organisations	140
5. Travel Arrangements	143
6. Accommodation Places	144

I Programme Information

I-1 Introduction

Saga University executed University Student Exchange Programme to study the relationship between environmental problems and the traditional cultures in Fiji and Tuvalu from March 9th to March 25th in 2008. Participants included Japanese students from Saga University, the University of the South Pacific (USP) staffs (Suva City in Viti Leve Island, Fiji), Tuvalu governmental officials and USP Tuvalu campus students (Funafuti City, Tuvalu). This programme is coorganised with Asia/Pacific Cultural Centre as a part of the 2007 University Exchange Programme within the framework of International Exchange Programmes between Japan and other UNESCO Member States for the Promotion of International Cooperation and Mutual Understanding.

This report is a description of an eco-tour taken by Saga University students who visited villages, schools, hospitals, government and UNESCO in Fiji and Tuvalu, in order to learn first hand about the many environmental, cultural, social, historical, and sanitation problems that exist there. The students also learned that there is a deep relationship between environmental problems occurring in the world. They learned that the use of natural resources in traditional life-styles can be called self-sufficient life style. A self-sufficient life-style is the one where people make use of the area's natural resources over extended periods of time without having caused shortages in those natural resources. For example, the people in Fiji and Tuvalu have continued to breed and grow plants, domesticate animals, use the soil for agriculture, for generations without causing resource scarcity problems. However, the recent westernization of life-style has resulted in serious waste management problems (i.e. rubbish) due to the separation of nature and human life. This has also resulted in a shortage of fuel and food.

The students learned the importance of maintaining traditional, self-sufficient, life-style, which emphasizes an effective use of natural resources, due to care of nature around the village by the inhabitants.

This is a record of what the students learned regarding the manner in which the traditional cultures interact with the natural environment which can have an impact on solving some of the environmental problems occurring in the world today.

Visit to Fiji and Tuvalu provided the Japanese students with a great opportunity to acquire new viewpoints on subjects such as environment, culture, society, community and the relationships among them. The students learned the importance of obtaining a comprehensive view when dealing with environmental problem, not only from the environmental viewpoints, but also from the cultural, educational, or political points of view. They learned that in Tuvalu, the most serious problem in these days is the indiscriminate dumping of rubbish in Funafuti Island, and consequent occurrences of disease and sanitation problems, rather than the loss of land by seashore erosion due to rising sea levels caused by global warming. Japan has heard many times that global warming is causing Tuvalu to sink into the sea due to the emissions of carbon dioxide (CO₂) from developed countries such as Japan. Of course, this problem is a global issue. However, the people in Tuvalu were facing other urgent problem.

I-2 Objectives of the Programme

The programme aims at learning the importance of connecting environmental problems and traditional life-style. The deterioration of the environment is caused by the separation of human activity from nature, resulting in the destruction of nature, a shortage of natural resources, and the increased accumulation of the waste.

The programme leads the students to construct a practical viewpoint to approach environmental problems through considering the environmental situation of Fiji and Tuvalu.

The programme leads the students to have an idea to connect environment and history, culture, society (including styles of living), and the international position of Fiji and Tuvalu.

The programme leads the students to consider:

- (1) the origin or background of environmental disruption,
- (2) damage control,
- (3) practical measures, and test their suggestions in Tuvalu.

Concrete Objectives:

To encourage students to consider the following points:

- (1) Humans cannot live on earth without causing damage to nature.
- (2) People's use of traditional tools and natural resources, and society's care to maintain natural environment.
- (3) Most of the environmental problems are not attributable to regional inhabitants, particularly those of developing nations who are actually suffering damage.
- (4) The destruction of natural ecosystem caused by the interaction between society and the surrounding area.
- (5) Environmental problems cannot be solved without consideration of the life-styles of the people.
- (6) And the following:
 - 1) What does the term "environmental problems" mean?
 - 2) What does the sentence "The environment is getting worse" mean?
 - 3) What is meant by saying "environmental problems were solved"?

Actual, hands-on experience investigating environmental problems is the most important activity for students to gain an understanding and subsequently, a realistic outlook on how to deal with them.

The students will be able to present their viewpoints in workshops and start up their own environmental preservation groups in Japan as a result of their increased awareness.

I-3 Delivery of the Programme

In Fiji:

- (1) Lectures by USP, Faculties of Islands and Oceans and the Pacific centre for environment and sustainable development (ESD), etc.
- (2) Visit USP projects sites where the villages are affected by the climate

change and environmental problems.

- (3) USP campus tour to understand the university system and the tertiary education system in the Pacific.
- (4) Visit Fiji National Commission for UNESCO and exchange ideas.

In Tuvalu:

- (1) Visit conservation area, the islands, to see the mechanical erosion of shore caused by the probable gradual sea level rise and high tide.
- (2) Go to flooded areas near runway during high tide.
- (3) Visit hospitals to observe people's health conditions and health care.
- (4) Visit a fresh-water supplying facility to learn about the serious shortage of potable water.
- (5) Visit an electricity generating facility to learn about the sustainability of the electric power supply.
- (5) Go to rubbish dumps to see increasing amounts of foreign wastes.
- (6) Interview government officials on Environment and Education.
- (7) Visit schools to meet and exchange information with the students.
- (8) Visit villages, houses, markets, restaurants, and churches in order to gain information about local community and culture, the people's way of life, and to compare these with those of the past.

I-4 Expected Results of the Programme

- (1) This programme will provide students with the opportunity to learn about the Fijian and Tuvaluan customs, life styles, and history. It will also contribute to reciprocal visits thereby increasing the understanding between Japan and these countries. The programme aids in building and promoting communication in order to increase understanding and contribute to maintenance of peaceful relationships.
- (2) In this tour, the students can learn about the many environmental problems through visits, lectures, and workshops in Fiji and Tuvalu. The tour will offer Japanese students the chance to promote reciprocal understanding, not only in their knowledge but also in their emotion, which

can provide their motivation for constructive action.

(3) In this tour, the students are able to learn about the relationship between global and local environmental problems and the natural, historical, social, economical, and cultural situations in Tuvalu and Fiji. The students can develop realistic viewpoints for dealing with environmental problems by analyzing the results of this tour. The students can also develop practical propositions and implement them in an attempt to improve the situation in Tuvalu.

(4) The students who participated in this tour are expected to:

(i) Play a leading role and give constructive opinions regarding the environmental course at Saga University, in the Saga Environmental Forum and extension lectures. These are regularly open to regional residents of Saga.

(ii) Be a steering or executive member of the environmental management committee at Saga University. Saga University has been granted the Eco-action 21 title certificate by the Japanese Ministry of the Environment. This title is for the entire university, including the five faculties of Culture and Education, Economics, Agriculture, Science and Engineering, and Medicine, and is significant in that Saga University is the first university in Japan to receive one.

I-5 In Advance Orientation

1 07/Nov/2007

Introduction of participants and orientation.

2 28/Nov/2007

First lecture on environmental problems and submission of ideas after reading the Tuvalu notice.

3 12/Dec/2007

First meeting regarding the purpose and the contents of the tour and the activities based on the UNESCO Charter of the Asia/Pacific Cultural Centre for UNESCO (ACCU) (from DVD, etc).

4 19/Dec/2007

First meeting with the Japan Travel Bureau regarding the formalities for going abroad. Information given about the outline of Fiji and Tuvalu, and travel insurance for going abroad.

5 09/Jan/2008

English conversation and composition training.
Travel Insurance application submitted.

6 16/Jan/2008

Second meeting regarding the purpose and the contents of the tour.
Practice filling in the immigration card.

7 13/Feb/2008

Meeting regarding the tour schedule and the Opening and Closing ceremonies.

8 18/Feb/2008

Second meeting with JTB regarding the formalities of going abroad.
Handouts were provided to the students.

9 27/Feb/2008

Second lecture on the environmental problems of the study area along with follow-up plans. Information was also provided regarding emergency contact and other tour necessities.

10 05/Mar/2008

Third lecture on the areas environmental problems and about other COE programmes in ACCU at USP. Also a member of the University's Health Management Centre provided information on diseases.

I-6 Follow-up Activities/Plans of the Programme

(1) Saga University acquired the Eco-action 21 certificate from the Japanese government. It is an environmental management system (EMS) which sets a limit on the amount of carbon dioxide discharged (largely through the use of electricity, gas, and oil), the consumption of fresh water, and the generation of waste. The aim of this programme is to increase the management ability of Saga University's students, including both

knowledge-based and emotional awareness. The students are to play a leading role and their input will be utilized for developing an environmental management system. This EMS report is open to the public.

(2) The students are expected to make presentations at the Saga Environmental Forum, establish a working group for environmental activity and to deepen and enhance their research and study on the environment throughout their time at Saga University. The report is open to the public.

(3) The students will take specific actions with the support of the Fiji/Tuvalu National Commission for UNESCO, the University of the South Pacific, and Tuvalu government. These actions will be written up in a report which will also be open to the public through Saga University's homepage, etc.

II Proceedings

DAY 1 (9, March, 2008)

Departure from Japan

The team met in Fukuoka International Airport at 1:30 P.M. and departed at 3:30 P.M. for Inchon, Seoul by Korean Air flight KE790. The team then took connecting flight KE821 (Korean Air) from Seoul to Nadi, Fiji at 7:00 P.M.

DAY 2 (10, March, 2008)

Arrive FIJI

Flight arrived at Nadi at 08:15 A.M. and the team exchanged money at a bank in Nadi Airport.

Wilderness Ethnic Adventure picked up the team at the airport. Ms Lorissa Hazelman, administrative assistant at the Department of Tourism and Hospitality, USP also met the team. The team left Nadi airport 10:00 A.M. stopping for lunch in Sigatoka town and arrived at the University of the South Pacific campus, Fiji at 3:00 P.M. We stayed at USP's Upper Lodge.

DAY 3 (11, March, 2008)

USP Campus Tour / Visit The Fiji National Commission for UNESCO

9:00-12:45 USP Campus Tour

Welcome speech was delivered by Dr. Eberhard H. Weber, Senior Lecturer of Development Geography and Natural Resources Management, Head, School of Geography, Faculty of Islands and Oceans, USP at the USP library. Dr. Eberhard Weber explained that USP consisted of various campuses in the 12 South Pacific countries of Tonga, Samoa, Marshall Islands, Kiribati, Tuvalu, Cook Islands, Niue and so on. Dr. Weber coordinated the campus tour and took the team to the places below.



(Fig. 3-1, 3-2, 3-3 USP Campus Tour)

9:15

At CELT (Center for Excellence in Learning and Teaching), Ms. Eileen Tumaleali`ifano, Director of CELT, explained that CELT provides support for students who have problems with their subjects, time management or planning. Ms. Afshana Anzeg, a CELT tutor, explained that CELT supports students by finding a suitable mentor for them who can guide them through their problems. CELT also provides professional support for lecturers who can receive training to enhance and improve their teaching skills.

9:30

The team was taken to the Media Centre where Mrs. Linda Austin, the Media Resource Coordinator, explained that the communication center, which was funded by the Japanese government, has satellite system to coordinate communication among the 12 countries' campuses that make up UPS. The Media Centre's net includes TV, video, computers and the

satellite system. Programmes such as recorded lectures on video and DVD are sent using the satellite system to all branch campuses. The satellite system is a collaborative effort with JICA and will run until 2010.

Communication among students and staff is accomplished through the internet, chats and power-point presentations. This poses a particular challenge to countries such as Kiribati whose official language is not English. Exams are paper-based and are taken at the students' own campus. The exams are then sent to USP Suva where they are marked.

The Media Centre also has a student radio station, called Radio Pacific which is broadcast to USP campuses and the surrounding communities. Radio Pacific has no advertisements as it is a publicly financed institution. The station is staffed by 60 students. The station also raises funds through peace concerts to promote world peace. The radio station is beneficial for the Pacific area because little financial resources are needed to run it, it offers many language programmes such as Fijian, French and so on, and is relatively easy to maintain. At the time the team was there, we met Mr. Taitusi Raciri, a Radio Pacific producer and presentator.

The team also visited the Graphic Design Studio, the USP department that is responsible for the printing of textbooks, pamphlets, and posters.

10:00

The group was met by Ms. Jenny Evans, Director of the Distant and Flexible Learning Support Centre (DFLSC), at the Centre for Education Development and Technology, who explained the distance education system at USP. We saw how the department makes a "Live Lecture". A live lecture is done at USP in real time and it includes talking to other member countries, asking questions and making comments to all students throughout the USP area. Sometimes a specific country's students are directly asked questions to which they must respond to. These lectures are also recorded. The computer used for recording has two monitors, one is for the voice tutor and the other is for the visual presentation. Over two hundred courses are available through this voice and presentation, and the timetable is full from Monday to Saturday.

The E-learning lab training centre has been working with JICA for two years. This lab is used to develop materials such as CD's and DVD's for areas which cannot depend on the internets. Years ago, there were only books that were sent from the "Distant Education System", now all the lectures at USP are recorded. Each lecturer decides which classes should be recorded on DVD and sent to the students along with books. The E-learning lab was making materials for the next semester.

10:15

The team was welcomed by Ms. Basant Swann, Senior Library Assistant at USP library. The library is based on the American classification system and no bags or cellphones are allowed in.

Mr. Anasa Waqa, another Library Assistant took the team for a library tour. The first floor of the library holds the Oceania Sports Information Centre (OSIC) and all related serial publications. These serials include indexes, annual reports, bulletins, directories, journals, memoirs, newsletters, transactions and yearbooks. The second floor of the library has the Social Science collection while the third floor of the library contains the "Pacific Collection". The library is aiming to collect all the published materials concerning the Pacific region, written by both natives and foreigners. On the same floor, there is a separate section for postgraduate graduate students.

11:30

At 11:30 A.M. Dr. Weber took us to USP's Lower Campus where the Faculty of Islands and Oceans (FIO) is located. Thus, all our meetings and wrap-up sessions were held at the Lower Campus.



(Fig. 3-4 at the seafront of USP Lower Campus)

13:00-16:00

Visit The Fiji National Commission for UNESCO

The team left the USP campus at 1:00 P.M. to visit the Fiji National Commission (NatCom) for UNESCO. The NatCom is on the 3rd Floor of Ministry of Education building at Marela House. The welcome speech was delivered by Mr. Isireli Seniburu, Secretary of NatCom, and chairman of FIJI National Commission for UNESCO.

Mr. Isireli Seniburu expressed appreciation to Dr. Okajima and his team for the visit, and highlighted that Japan has much to share with Fiji and Fiji wants to learn from Japan. For example, how Japan has gone through many problems and overcome many of its pollution problems.

Professor Toshiya Okajima of Saga University, a professor in the Faculty of Culture and Education, expressed his appreciation for accepting the team visit and the programme's support from UNESCO. He explained the objectives of the tour under UNESCO's expectation as to what he would like the students to achieve.

Ms. Salote L. Dugu, the principal Education Officer of Technical Vocational Education Training (TVET), Fiji, welcomed the team on behalf of Mr. Josefa Natau, the Director of TVET and Chairman of the NatCom Science Committee. Then, she expressed appreciation of the team's visit. She was interested in knowing about what the major environmental problems in Japan are now. Ms. Dugu also suggested we should visit conservation area in Fiji in order to achieve our objective.

Mr. Misiwaini Qereqeretabua, Director of the Institute of Fijian Language and Culture, Ministry of Fijian Affairs, Culture & Heritage & Provincial Department, Fiji, welcomed the participants. Mr. Qereqeretabua highlighted the fact that he admires Japan because Japanese people are educated in the Japanese language.

In the question and answer session, we discussed the language used for education. In Fiji, English is used for Education although the standard Fiji language and some 300 dialects are used for daily life. Most Fijians speak English, standard Fijian and their native dialect. Fiji looks favourably upon Japan as it is able to keep its unique culture vibrant through law, history books and so on. Fiji has no legislation to protect the Fijian culture and there are grave concerns of losing it due to the westernization of the society.

At the meeting, Mr. Isireli Seniburu, Mr. Misiwaini Qereqeretabua wore the traditional clothing of Fiji called “thru” which is worn to show respect.



(Fig. 3-5, 3-6 in Fiji National Commission for UNESCO)



(Fig. 3-7 Workshop in USP upper Lodge)

DAY 4 (12, March, 2008) Lectures on Field Buretu

8:30-9:10

Mr. Fine Lao, a Fellow at the Climate Change in the Pacific Centre for Environment and Sustainable Development (ESD), Faculty of Islands and Oceans, USP, gave us an interesting lecture on climate change and the impact on the Pacific Islands.



(Fig. 4-1, 4-2 Mr. Fine's (left) and Mr. Leone's Lectures)

9:10-11:00

Dr. Weber, Mr. Lao, Mr. Leone Limalevu, a research assistant for the ESD, Faculty of Islands and Oceans, took us to a Buretu village where USP has a project. Buretu is located on the east side of Nausori airport and in the Rewa Delta area. Buretu has been greatly influenced by climate change as it is affected by disasters and coastal erosion. Buretu has a river along the village and the coast has mangrove forests.

Sebusebu Ceremony: The team was taken to the Buretu community hall, where some members wore the thru in order to show respect to the village people. The Sebusebu started with a prayer, and the entire ceremony was carried out with the native language. Mr. Limalevu presented a gift of yaqona to the village. Three men made a kava drink, which is made from the root of the yaqona. Once the village chief appeared, the kava was poured in bowls and then was drunk by all the attendants as a token of goodwill and respect. Following this, the village chief accepted the team to the village and welcomed them as members of the community.



(Fig. 4-3, 4-4 Sebusebu ceremony in Buretu village, Fiji)

11:00-11:30 Morning Tea

Team members introduced themselves and were then served morning tea. The meal was prepared by the ladies of the Buretu.

11:30-12:00 Village Excursion

Mr. Limalevu, (a research assistant at ESD) briefly explained the activities of the day. The first activity was a village excursion. Team was divided into 3 groups, each taking different courses escorted by a few young men from the village. The groups are expected to report to the chief what they found.

One of the problems that Buretu is facing is the impact of climate change. Rainfall has been affected and flooding has occurred due to an increase in sea levels. The Intergovernmental Panel on Climate Change (IPCC) estimates a 0.5 meter rise in sea levels over the next 100 years. The impact of this is also seen on the plantations, facilities, toilets and sewage tanks.



(Fig. 4-5 Mr. Leone's Briefing in Buretu village)

12:00-13:30

The team walked around the village in three groups with USP professors.

Group 1: Yuko Kikukawa, Kana Hideshima, Kiyoshi Yoshimizu, Toshiya Okajima

Group 1 found that river flooding has led to an increase in erosion. The village people are trying to protect the land from erosion by making higher banks, seawalls and planting trees. The seawalls are not made of artificial materials like concrete but rather are made of logs which do not harm fish nor pollute the river. The mangrove has a special feature as the roots grasp the soil and helps to keep it from washing away. The fish which used to live in lower part of the river are now coming up nearer to the village which is an advantage of climate change.

The children wear no shoes and showed us the bottoms of their feet. Some had open sores and were suffering pain. Diabetes is a growing problem with adults and has led to an increase in the amputation of legs. Men generally work outside in fields such as fishing and agriculture, where as women make baskets, carpets and so on. Some men work in the military and a number of them have gone to fight in Iraq. Of interest to the team were the funeral practices of the village. The deceased is left with the family for 4 days prior to burial.

Group 2: Nami Nakahara, Emi Hideshima, Sayaka Mukai, Junko Okajima

Group 2 also learned about the impact of climate change. The village now receives more rain than before, and this has led to more flooding of the river which has destroyed the banks of the river. The impact of this is that the natural land barrier between the river and sea is being lost, so seawater now often mixes with the freshwater due to rising sea levels also caused by climate change. Some plants and fresh water fish die from the sea water. Fresh water fish is also carried away by the high tides. The group also learned that hurricane damage is increasing and getting more severe.

As for the villager's life, they made a waterway for the fish to come in from the river. The people depend on coconuts and mangroves which are sold at the markets and used not only for food but also as fuel. In the plantation area, a lot of cassava and sugar cane were planted. Some modern technology such as TV's and audio players were seen as well as the transmitter for cell phone calls which was built in 2007.

The school and teachers houses were built with village money. Even though the school is a public school, there is little assistance from the government. However, the teachers are sent by government. One teacher has to look after two different grades and that makes it difficult to teach.

Group 3: Nanae Oshima, Aki Koga, Sayaka Shibata, Kumiko Shinohara

Group 3 found that it rains two or three times a week in the village and that enables most plants to grow without watering by human hands. The village has a big hurricane once a year. Drains in the village are not well maintained so that drainage is poor. A mangrove has been planted at the mouth of waste water since a mangrove is able to purify the water. Most things in the village, including pigs, are common assets of the village. There is frequent bus access to Suva and the road has been paved for 10 years.

Four neighbouring villages, along with Buretu have built a school with some government assistance. Lunch is cooked by mothers' groups in each village who take turns cooking. The lunch fee of 50 cents per day is collected

from each student. There are some students who cannot pay for the lunch. The students from each village go to school together and come back to their villages together.

13:45-14:45 Presentations

Presentation of Group 1: by Mr. Kiyoshi Yoshimizu.

The erosion of the river is taking away soil, so the village people are making river walls and are planting mangroves. The reason they plant these plants is to keep land because the roots catch the soil. There are many fish in the river and people catch the fish using nets and fishing line. Many fruits grow like mango, papaya, banana, coconut, passion fruit, grapefruit and so on. We saw people making carpet by hand.

The purpose of fishing by the village people is only for eating. The main income of villagers is obtained by working in Nausoli or Suva city. Fresh water is not always easy to obtain. So water is either piped in from Nausoli city or people dig well in the ground and save the water for use after it clears from sedimentation. The people make drinkable water by using the clear layer at the top of the water.

Presentation of Group 2: by Ms. Emi Hideshima

The strongest impact we saw was erosion. Heavy rains take away soil from the banks of the river. Fish are also carried away by seawater. At the public school ground, there was a big hole deep enough to see the roots of trees. The hole is dangerous. However, there is no way to fix this. The only solution is to have a good engineer to repair the pipe. Education is needed to make engineers, which illustrates the importance of education. But we found village people have to pay for the public primary school. In Japan, people do not need to pay for compulsory education as the government provides free text books. In this village some children cannot go to school because of poverty. We found these were problems of Fiji government.

Presentation of Group 3: by Nanae Oshima and Aki Koga.

As all the members in group 3 want to become teachers in the near future, the group looked closely at the school. Teachers told the group a lot of problems they face. One problem is that there are not enough teachers, and the teachers have great responsibilities. Teachers expressed the difficulty of teaching because they have to teach in English which small kids do not understand. Additionally, there are not enough textbooks which also makes teaching very difficult.

After the presentations, there was a question and answer session between villagers and the study team. People from the village explained that English is used in education in Fiji because Fiji was a British colony. The teachers use English. But small kids do not understand English. As a result teachers have to translate everything into the Fijian language so that the small children can understand what is taught.

After that Mr. Leone Limalevu, added that English is a developed language which can express so many things. The Fijian language, on the other hand, is not so well developed and one Fijian word can have three or more different meaning. So the act of translation or interpretation from English into Fijian is very challenging for the teachers.



(Fig. 4-6, 4-7 Students' presentations (left) and Mr. Leone's lecture)

15:00-16:00

Lunch was prepared by the people of Buretu. Fish, crabs and mud lobsters were caught in the river and from the river bank. Vegetables such as cassaba, taro and fruits such as mango, pineapple, and bananas are grown and produced in the village. These were cooked in the delicious Fijian style.

16:00-17:00

Presentation of "The Application of an Integrated Assessment & Action methodology to address the impact of Climate Change, Disaster Risk Management and Sustainable Development at Buretu Village, Tailevu Province, the Fiji Islands", by Mr. Leone Limalevu, a research assistant, Faculty of Islands and Ocean, USP.

METHOD:

USP applies a "Community-Based Methodology" for the project. The method ensures the community is an essential part of its project from the stage of engaging the community, doing the assessment, help doing the work, sharing information and so on. This is an important dialectic as not only does the village get clear information but also aids in improving conditions as the village has accumulated a great deal of knowledge over hundreds of years. Additionally, it is not good to just do the work for the village because once the project team leaves nobody will remain to continue the work.

STEPS:

1. Write to the donor: In this case, the government is funding the project.
2. Consultation with the community: Ask the village about problems then the village writes to USP and USP comes and consults
3. Assessment: The USP team makes their assessment while the community team makes their own assessment. The two teams share their findings and if needed bring in a team of outside experts such as engineers, ect.
4. Planning: Together with the community. Both USP and the community

develop a plan and discuss what they can do.

5. Implement: Initiate the work needed with the community.
6. Monitor: The project is monitored by the community. Every 3 to 6 months, members from USP come to the village and check if everything is OK, and continues the work. If things are not OK, they change the work.

The USP project manager is Dr. Kanayashu Koshy, the project members are Mr. Fine Lao (technical assessment), and Mr. Leone Limaleve (research assistant) and one financial coordinator. The community has the project manager talk to both the community and the USP team. So when USP team comes to do the work, everyone knows what is going on. It is also important to use simple language throughout the process so that village can clearly understand what is being done and what is expected to be done.

Problems Facing Buretu

1. Riverbank Erosion
2. Inundation: At the high tide water comes just under the floors of the houses.
3. Agriculture
4. Drainage at the back: Because the water does not flow away people can not plant therefore places they can use for planting is limited.

Address: The most important problem they are facing is that time and funding is very limited. After they solve one problem they quickly go on to the next problem. To make the work successful, the key is taking it “Step by step” and “One step at a time”.

USP Project Site

There are four project sites the team is addressing near Suva. One place has a problem with the lack of water and water pollution. Another has the problem of soil erosion in the lower areas (Buretu). A third site has the problem of soil which is reducing the amount of village land. The fourth site has the problem of little water.

Buretu Geomorphology, Hydrology, and History

Buretu is visible on the internet through Google satellite. Here you can clearly see the old mangrove, mature mangrove and the very young mangrove. The project planted mangroves at the bank near the church where there had been water erosion, and the mangroves are starting to grow. Mr. Leone Limaleve explained this by showing a picture of how the land has changed from the past.

Project Options:

1. Implementation of the soft method: Plant trees
2. Implementation of a hard method: Make hard walls
3. Implementation of both: Remove houses from the river side and relocate the village

Discussion with Buretu

1. Soft method: Buretu had not done this before.
2. Hard method: Buretu built two sea walls to stop the sea water. Unfortunately both fell into the river when the flooding occurred. For river drainage, Buretu made use of a dredge to remove sediment from the river in the 1980's and reclaimed high above the river bank. Although this was effective it was, unfortunately, too expensive.
3. Implementation of both: Buretu has other land available but it is far away and the village prefers to stay at the present location.

Plan

Combination of both the soft and hard methods.

1. Coconut planting in the field
2. Plant vetiver grass along the river
3. Make walkways along the river to stop erosion
4. Make a foot track into the river that does damage the riverbank

Vetiver (a plant)

Vetiver grass is a very effective plant as the roots grow about 3 metres

deep and hold the soil. It is not a weed as it does not spread but rather stays where it is planted. Vetiver is effective as it can be planted on both level areas and on very steep slopes.

At Present

The project is now doing the first step and monitoring.

17:30-18:00

Coconut Planting: The USP project team is taking steps to plant coconut trees to stop erosion. The village is in the delta. The need to plant coconut trees is not only along the river, but also inland where the water runs to the water dump area. One group has planted coconut in the bush.

Again, the team was divided into three groups and we all got to try coconut tree planting. The coconuts are shoots which are suitable for planting. A hole is dug big enough to hold the fruit part of the plant and then this covered with soil and lightly stamped on it to make it stable.



(Fig. 4-8, 4-9 Planting of coconut trees in Buretu village)

18:00-18:30

The team and Buretu people had time for a communication exchange.



(Fig. 4-10, 4-11 with children (left) and at the school in Buretu village)

18:30-19:00

Afternoon teatime

19:00-19:15

Sebusebu Ceremony for permission to leave the village

19:15-19:30

Exchange of songs

The team sang the Japanese song “If you are happy, clap your hands” and the village people sang Fiji farewell song called “Isarei”.



(Fig. 4-12 Exchange songs in Buretu village)

DAY 5 (13 March 2008) Lecture on Fields going to Vanua Navakavu

9:00-10:00

Dr. Randolph R. Thaman, Professor of Pacific Islands Biogeography Head, School of Geography, Faculty of Islands and Oceans, USP, provided us with a lecture to Vanua Navakavu. Vanua Navakavu is located on the Muaivusu Peninsula to the east of Suva. Vanua Navakavu is quite famous and one of the biggest fishery villages in Fiji. The marine products are sold at Suva Market and other Markets in Fiji. Some products like sea cucumber go to Japan for consumption.



(Fig. 5-1 Dr. Thaman's explanation about geographical features of Suva city)

In Fiji 83% of land is owned by the villages and used and managed by a designated group of Fijian people. 8% of the land is owned by government and only 9% of the land in Fiji can be sold or bought. Each village has its own people, traditions, culture, history and ancestor's spirits. There are more than 330 islands in Fiji. Some villages have rich mountainous land and rich oceans.

Traditional fishing grounds are called *iqoliqoli* and includes both marine and freshwater fishing grounds. This include reefs, lagoons, reef passes and channels, the open ocean, near shore ocean, blue holes, reef flats, seagrass beds, mangroves, mangrove channels and streams.

The problems related to the sustainability of fishing and the condition of the *iqoliqoli* first emerged in 1990's. The major problems were caused by:

1. Over fishing,
2. Illegal poaching (occurs at night making it very difficult to patrol and control),
3. Waste pollution (the trade winds blow from the direction of Suva city and large amounts of waste and oil from the vessels passing by arrive end up on the seashore of Navakavu),
4. Use of fish poison,
5. The degradation of mangroves (mangroves are important for fish habitat, the laying of eggs, and nutrition for fish, etc),
6. Land and coastal erosion, which increases the sedimentation of reefs and lagoons causing the loss of beaches and coastal vegetation.

These problems led to the need to protect the ocean, and subsequently a portion of Navakavu's ocean is now the Marine Protected Area (MPA) called *vanua maroiroi*. Some of these problems are present today such as illegal poaching, waste, and coastal erosion and still need to be solved. Other parts of Navakavu's ocean area are still used as traditional fishing grounds.

On the way to Navakavu, we passed the industrial area. In 1960's and 1970's the ocean was clean and abundant. However, the growth of the industrial area killed a wide range of reefs. Mangroves are important to stop land erosion as their roots grow wide and deep into the soil which acts as a hold on the soil. Unfortunately many mangroves have been cut and exported to Japan. Additionally tuna is caught in the area and exported to Japan.

In this area, the primary forest consists of timber trees. For the past 40 years the people have planted sea pine or Caribbean pine for the secondary forest. These trees are straight and the wood is good for building houses. This timber and the wood chips are exported to Japan as well.



(Fig. 5-2 Dr. Thaman's explanation of plants in Waiqanake village, Fiji)

Vanua Navakavu has four residential villages named Muaivusu, Nabaka, Waiqanake and Namakala.

After the lecture, Professor Thaman answered questions raised by participants, particularly in relation to the usage of village land and the way assets of the villages live on.

10:00-10:30

Sebusebu Ceremony at Waiqanake village.

Waiqanake village has a population of around 400 people. Of the 400, only 8 village members are working in other cities or towns. The village's income comes largely from fish or coconuts which are sold at the market. 80% of the village people have no money. There is no chemist shop to buy medicine, no supermarket to buy food, fruits or drinks, no police or hardware store. The people of the village are basically self-sufficient. In the village there exists several different classes and functional roles such as the chief, chief guard, chief's doctor, spoken people, government representatives, lawyers, priests,

house builders, and fishermen. The self sufficiency of the village is being threatened as the people have found that the algae now appearing on the surrounding reefs is causing problems with fishing.

10:30-12:00

Field Excursion in the village: Theme “A Self-sufficient way of Life”.

Some villages grow more than 150 different kinds of vegetables. Additionally the people have planted various types of medicinal plants which the village people use to treat medical problems.

For example wild ginger is used to stop a cough, stop bleeding and for a sour throat. Figs are used for stomachaches while danidani is good for bruises when used as a poultice. *Yare* is used to treat people with appendix problems and burk of litchi is used to treat cuts.



(Fig. 5-3 Waiquanake village resident explaining about medically usable plants)



(Fig. 5-4 Taro is villagers' staple food)

Taro, a type of potato, is one of the staple foods. The entire plant is used as food including the root, the leaves and stems. The top part of the Taro plant is saved and so that it can be replanted. Taro shoots can be seen three weeks after planting. Breadfruit from the breadfruit tree is also a staple food. The fruit is boiled and tastes similar to bread. Cooking bananas, also a staple food, are harvested green and eaten as a vegetable. Yams are eaten and are harvested twice a year. Cassava, known also as tapioca was introduced from South America. Sugar cane is grown to make sugar. Additionally vasili can also be used to make sugar if it is cooked for four days. *Yaqona* is planted as are Tahitian or Pacific chestnuts.

As for vegetables and fruits, *bele* is an important vegetable which comes from the hibiscus family. It is like spinach and contains vitamin C, vitamin A, and is high in iron. Coconuts, corn, mere apple, Fiji asparagus and noni were also observed by the team.

All the fences are natural fences. The houses are constructed from native trees and mangrove trees. Pandanus leaves are used for making mats, baskets, hats etc. The leaves are put into sea water, boiled and dried. After drying they are dyed black which makes black and beige designs for the products in which they are used. The dye is natural and comes from swamp primrose which is grown in the village. Other plants that are used include botebotekoro (branches used as toothbrushes), litchi and kura as fuel for fires.

In a field near the village more than 300 different types of orchids grow naturally. The villagers also use the field to cultivate duva, and derris root. These plants are pounded to make fish poison which is used to kill fish at low tide. The field looks very unorganised and untended but the reality is that this is not so. It represents an example of biodiversity and it keeps the land rich and healthy. There are no soil or plant diseases found in this field.

12:30-13:30 Lunch

Breadfruits, yam, taro, fried fish, crab curry vegetable curry was served.



(Fig. 5-5 Lunch in the village)

14:00-15:00 Excursion to the iqoliqoli (fishing grounds).

Dr. Thaman led the team down to the seashore along with several villagers. He explained that women are often responsible to getting marine products that are on or near the seashore such as sea urchins. These are sold at the market for five dollars each. While the market is open every day, the biggest market days is on Friday and Saturday morning. Shellfish and crabs were found on the seashore during this excursion.



(Fig. 5-6, 5-7, 5-8 Study on biodiversity at the seaside and Mangrove trees near Waiquanake village)

The team then walked to the mangrove forest. As mentioned previously, mangroves are very important to the local fish. The hatchlings hide in the mangroves and find their food there. Mangroves are somewhat unique in that they are one of the few land plants that are able to grow in sea water. The plant has a special root with which gets air. Mangroves are important to the village as they derive much of their medicine and dyestuffs from there.

While we walked along the coastline we saw both burnable and non-burnable rubbish everywhere. The village takes one day every month to collect the waste and burn it. This is all that the village has been able to do with the garbage so far.



(Fig. 5-9 Articles washed ashore, near Waiqanake village)

15:30-16:00 Lami landfill

The Lami landfill is located a 15 minutes drive east of Suva city when traveling from Navakavu. It is quite old and was used for 50 years until the new Naboro landfill was built a few years ago. The Lami landfill gave off such a foul odour that the nearby residents asked the government to move the landfill. The Lami landfill is no longer used and is now covered with soil and has plants on it



(Fig. 5-10 the Lami Landfill (now covered by grass))

In Fiji, there is no recycling system, rubbish separation system (burnable and non-burnable), nor is there garbage collection for different types of garbage. The country has no industrial recycling factory as well because the government finances are limited and the population is too small to make such a plant feasible. As a result, all the wastes end up in landfills.

The Naboro landfill, which is a new one, is located 15 minutes west of

Navakavu. It consists of a deep hole that is surfaced with a wide sheet that is meant to stop poisons and other toxins from seeping into the underground. (Both landfills close at 4:00 P.M.)

DAY 6 (14, March, 2008) Arrive in Tuvalu / Opening Ceremony

The team left the USP Upper Lodge at 6:30 A.M. for Nausori International Airport. We checked in at 8:00 A.M. and departed for Funafuti, Tuvalu on Air Fiji flight PC601. We arrived in Funafuti, at 12:30 P.M.



(Fig. 6-1, 6-2, 6-3, 6-4 Funafuti Atoll from ariplane)

Ms. Lanuola Fasiai of the Tuvalu National Commission for UNESCO, Ms. Katalina Taloka, the Director of Education in Tuvalu, and Ms. Syla Taafaki-Tevao the guide, coordinator and facilitator designated by the Tuvalu Government, Travel & Shipping Consultant, Tuvalu Air Travel and Shipping welcomed us at the airport. We were given time to exchange money and then walked to our accommodation the Filamona Moonlight Lodge.

15:00-15:30

The team made a courtesy visit to the Tuvalu National Commission for UNESCO, and the Department of Education. Ms. Taloka, the Director of Education officially welcomed us and she answered questions regarding the education system in Tuvalu asked by team members. We learned that there are two primary schools in Funafuti, each one in the outer islands. The primary school is open from 8:00 A.M. – 1:00 P.M. There is no lunch provided by the schools so the students go home and have lunch. One reason for the short school day is the heat. It is too hot in the mid day for the young children to concentrate on studying so they are let out. English education starts at the age of 8 or 9. The textbooks are brought from Fiji and are used by all the students, year after year. There is one secondary boarding school on Vaitupu Island. Classes are held 8:00 in the morning until 3:00 in the afternoon. There is also one private high school in Funafuti. Families do not have to pay for primary education but they do need to pay for their secondary education and kindergarten. Kindergarten is not compulsory for children but families are encouraged to send their children there before primary school.



(Fig. 6-5 in Ms. K. Taloka's office)

19:00-21:30 Opening Ceremony

The welcome speech was delivered by Dr. Falesa Pitoi, Hon. Minister for Education, Youth and Sports, Government of Tuvalu. Dr. Pitoi welcomed the team and the participants and he expressed that the team's visit would be a valuable one.

Mr. Minute Taupo, the Secretary-General for the Tuvalu National Commission for UNESCO and also the Permanent Secretary for the Ministry of Education, Youth and Sports, Government of Tuvalu, also welcomed the team and expressed his appreciation for the team's Eco-Tour visit all the way to Tuvalu. He said that climate change is affecting Tuvalu, and it is the issue that all people should think globally about at the same level. He also expressed an interest in hearing about the outcome of our team's research and findings in Tuvalu, their suggestions to help Tuvalu and how the team enjoyed Tuvalu.

Professor Toshiya Okajima, an associate professor from Saga University's Faculty of Culture and Education, spoke on behalf of the team. He spoke of his appreciation to Tuvalu government and Tuvalu National Commission for UNESCO, for collaborating with Saga University in creating the programme and accepting to arrange and host our team's visit.

Ms. Kana Hideshima, a student in Saga University's Department of Culture and Education, and a team member delivered an opening speech. She highlighted what is happening because of the global warming and rising sea levels in Tuvalu. Ms. Hideshima pointed out that this catastrophe will take place in other parts of the world, including Japan, in the future unless something is done. Despite the seriousness of this problem, however, she has found that not many people in Japan are aware of it. Ms. Hideshima expressed her will to see and learn about the problems in Tuvalu and to make use of this experience and knowledge where possible in the future.

The Ceremony was followed by the introduction of the Saga University team and other participant.

Ms. Katalina Taloka, the Director of Education, Ministry for Education, Youth and Sports, Government of Tuvalu, gave us a warm welcome and provided us with the full schedule that the team will be following during the week. Mr. Mataio Tekinene, Director of Environment, Ministry of Natural

Resources and Environment, Government of Tuvalu, spoke about the environmental problems in Tuvalu and said that he would like to learn what good solutions Japan can provide Tuvalu in his welcoming speech. Mr. Petieli Noa, Youth Officer, Ministry for Education, Youth and Sports, Government of Tuvalu, and Mrs. Lanuola Fasiai, Tuvalu National Commission for UNESCO officer also welcomed the team and then Mrs. Fasiai introduced the Cultural Exchange Group from Tuvalu.

The ceremony was followed by traditional dances and songs performed by the Tuvalu people. The Japanese was invited to participate in the dance and were able to wear traditional Tuvaluvian clothing.

Mr. Noa, the Youth Officer from the Ministry for Education, made a closing speech thanking the dance and song team for their inspiring performance during the ceremony and expressed his wish for a successful week for the Japanese team. The ceremony was concluded with a prayer offered by Mr. Noa.

DAY 7 (15, March, 2008) Fangafale Island Tour / Home Visit

9:00-12:30

Mrs. Sylia Taafaki-Tevao, who provide a van, explained that the tour would first go to the south end of Fangafale Island in the morning and then later to the north end of Fangafale Island for home visits in the afternoon. Fangafale Island is the main island of Funatuti Atoll, acts as the capital and is about 10 kilometers long.

During the ride we passed by the government officers residential area, the Governor General's residence, the Prime Minister's residence, the Philatelic Bureau, the Library, a fresh water supply tank, the Tuvalu National Provident Fund Bank and a cemetery.

Mrs. Taafaki-Tevao explained that Tuvalu houses have two parts. One acts as the main house where people sleep and the other is papa, just outside of the main house, where people stay mostly during day time to do things. Another feature Tuvalu households is that each family keeps pigs which are used in important ceremonies such as weddings and funerals.

She also educated us on the tax deduction and pension system in Tuvalu. 30% of one's salary is deducted as tax and another 10% is deducted and put in the Tuvalu National Provident Fund Bank. The people can choose when to start receiving their pension, either when they stop working or when they reach 60 years old.

Passing the cemetery we saw that the tombs are often decorated. Mrs. Taafaki-Tevoa explained that in the Tuvalu tradition tombs are decorated with many of pillows and rays made by the relatives after a funeral. People are welcome to take them when they pass by. The deceased are predominantly buried which tends to exacerbate the shortage of land problem Funafuti is facing.

Once we arrived at the south end of Fangafale Island, the team took a walk on the beach. We learned that the beach there is not made of sand but rather from coral, which shows that the land of Fangafale is made from atolls.



(Fig. 7-1 the Southern part of Fangafale Island)

We could see Fatato Island which is a part of the Funafuti atoll at this point of Fangafale Island. Mrs. Faataki-Tevao told us about the damage hurricanes can make. For example, in 1972 a strong hurricane (named Bibi) hit the island and destroyed many houses. This hurricane also caused a large pile of stones to appear between the two islands of Fangafale and Fatato.

On the way back, the team stopped at a location they noticed was full of garbage. It was a residential area and the water was covered with waste

and rubbish. A few students interviewed residents there and found that they suffer from rashes, itchy skin and coughing.

Responding to students question about the recycling system, Mrs. Taafaki-Tevao pointed out that there is no recycling system in Tuvalu. The only recycling found in Funafuti is at a bar near the airport runway. The company has a collection box for cans. They crush these cans and exports them to Australia.



(Fig. 7-2 Rubbish thrown away in the pond, in Southern part of Fangafale)

13:00-14:00 Lunch

14:30-16:30 First Home Visit

The team was taken to the home of Mrs. Cinderella Taulamati, an elderly lady and Sunday school teacher. Mrs. Taulamati family is a traditional extended family as some of her children and their families live near Mrs. Taulamati's house on the family land in Funafuti. Mrs. Taulamati's other children live the same way on their spouses' family land. One son is working for a construction company but most of family income comes from selling fish.

Mrs. Taulamati gave a brief overview of how a traditional extended family

lives on their family's land even after marriage. The land belongs to the entire family and is passed down to members of that family but not outside people. After marriage children have the responsibility to look after their parents and often they visit their parents once a week. Mrs. Taulamati has no pension but she has no worries about this as her children cook and bring all her meals to her. As a result of this traditional arrangement Tuvalu has no need for nursing homes to take care of elderly people.

Mrs. Taulamati answered many questions regarding married life. There are happy marriages and cases of divorce. There are many seamen in Tuvalu, and when seamen go overseas for long periods of time such as a year, wives usually stay in with the husband's parents. All babies are born in a hospital in Funafuti as women feel it is safer to give birth at the hospital. The students asked Mrs. Taulamati about the rise in sea levels. She answered that because she believes in God, who promised not to flood nor destroy mankind, the land of Tuvalu will not sink.

Mrs. Taulamati also answered questions in relation to the changes in life style. She notices that some Tuvalu cultures are disappearing because of the influence of Christianity and technology. However, she feels that the people should help themselves adopting the new style of living.

Mrs. Taulamati answered what makes her the happiest was that her children and grandchildren believe in God's word. She also said that what makes her the saddest is that they do not believe in God's words.



(Fig. 7-3, Mrs. Taulamati's granddaughter making coconut oil)

After the interview, her granddaughter showed us how to make coconut milk using a special kit. She demonstrated how it should be grated and then squeezed. She also explained that the milk must be cooked hours to make coconut oil and cream.

17:00-19:00 Second Home Visit

The second home visit was to the house of Mr. Petueli Noa and his wife Mrs. Tiani Noa. It is located near northern top of Fangafale Island. Mr. Noa showed the team how to make a roof using Pandanus leaves. He explained that the people of Tuvalu depend on coconut a lot. People can drink coconut juice or they can leave the fruit for as long as 3 or 4 months before consuming. If there is no liquid sounds coming from the fruit when shaken the coconut has a different taste called takataka. In this way, coconuts are a preserved food which can be kept for a relatively long period of time. The shell of the coconut is also used as a bowl or dish while the bark of the tree is used to build houses. Each family needs coconuts and some land to plant them on.



(Fig. 7-4, 7-5 in Mr. Noa's house, how to tan coconut leaf (left) and preserve fish by wrapping up)

The average family requires 20 coconuts while a larger family needs more.

Mr. Noa also showed the team how to make preserved fish. They use bonito fish for special ceremonies such as birthdays, weddings and funerals. After removing the insides from the bonito, he salted and wrapped it in coconuts leaves, smoked it, and then placed it in a hole in the ground. In this way, the fish can be preserved for over 6 months. It will also be dug up and eaten as an emergency food during times of poor fishing or disasters. In Tuvalu, fish are caught only for the consumption that day, and only for the Tuvalu people. Fishermen in Tuvalu do not catch fish to sell overseas.

Mrs. Tiani Noa showed the team how to make traditional leis worn by Tuvalu people when they congregate in daily life, or gather for special occasions. In the process, she made strings from pandan leaves and, next, put flowers around them, while the students watched on.

Mrs. Noa's family residence was equipped with western appliances such as a refrigerator, oven, washing machine, and so on. Her family explained that life in Funafuti has rapidly changed over the last 30 years, and the self-sufficient lifestyle exhibited by Mr. Petueli Noa is hardly seen in Funafuti now.

DAY 8 (16 March 2008) Sunday (Resting Day) / Church Visit

The team made a visit to the main Christian church in Funafuti, which is a 15 minute walk from the center of Funafuti. It was a special day and the service was carried out by children. The following Sunday would be Easter, so that the team learned that the next week was a holy week.

People in Tuvalu keep the Sabbath. As a result, the team took rest on Sunday afternoon.

DAY 9 (17 March 2008) Conservation Area

8:00-17:00

Mr. Semese Alafaio, marine conservationist, at the Tuvalu Association of NGOs (TANGO) was a guide for the team's conservation area visit. There is a regulation that visitors must be accompanied by a conservation officer when making such visits.

Mr. Semsee Alafio briefly explained the itinerary for the day. After that, we began touring several islets. These included Funafala Islet where the team could witness a traditional lifestyle, Fualopa Islet where the team could observe abundant marine resources, Tepka Vili Vili Islet which has nearly disappeared because of a rise in sea level and erosion, and Tepka Islet, which has also displayed visible signs of erosion.

9:30-12:00

It took nearly one hour to get to Funafala Islet from the wharf behind the Vaiaku Lagi Hotel.

While riding on the boat, Mr. Semese Alafaio pointed out rays swimming in the ocean. Near the shoreline of Funafala Islet, there was an experimental mangrove plantation, and Mr. Semese Alafaio explained that it was operated by a Japanese NGO, Tuvalu-Overview.

The team landed on the southern part of Funafala, and walked from the lagoon side to the open sea side where there was a big inlet. Mr. Semese Alafaio explained how the sand along the coastline had gradually eroded, resulting in the coastline receding 50 meters since the 1940s.

There are presently four families living in Funafala. One of these families was forced to move their house inland due to severe erosion.

These families have all chosen a self-sustaining lifestyle, not relying on money. The only cash income they make comes from handicrafts they produce and sell at the market. An example of their self-sufficient lifestyle would be that they paddle canoes, requiring no fuel, when they need to go to Funafiti.



(Fig. 9-1, 9-2, 9-3 Interview to villagers by the students (above), the foundation logs of the house left after the house moving to higher ground (below, left), rain-water storage tank and a water pipe (below, right), in Funafala Island)

Mr. Semese Alafaio lectured on biology, the effects of global warming, climate change, and geography.

1. The mangrove grows only in seawater. The *pandanus* is such an adaptable plant that it grows in sand and on rocky ground. Both mangroves and *pandanus* help stop erosion.
2. The *fetau* fruit produces strong glue. It is used as an adhesive for making goggles, and does no harm to the environment. Similarly, taume leaves are used for making fires.
3. The fiber of coconuts is used to make rope. The sap of coconut trees is

collected in a bottle every day, and is used to make toddy. Leftover dried coconut fruits and peels are, also, used as fuel.

4. Households depend on water tanks. The government provides one tank per home. People were able to make wells, and drink underground water before World War II. The underground water, however, has since become contaminated with sea water, high in salinity.

In regards to climate change, the arid season used to be longer and the rainy season used to be shorter, however, this trend has now reversed. On a positive note, plants and vegetables grow better due to increased rainfall. On the other hand, from a negative standpoint, there are increased risks of flooding and land loss, as well as a decrease in biodiversity of marine life, in particular the decline in the tuna population, as a result of increases in seawater temperatures.

Team members brought up questions regarding possible soil creep as a result of too much ground water. Mr. Semese Alafaio, then, explained the topographical character of Tuvalu using a panel and diagram. After an underwater volcanic eruption, magma cooled down to become land. The land gradually sank and the center of it was eroded by waves creating a lagoon shape. Hard bedrock lays just 2 or 3 meters below the surface of the land. Rainwater has soaked into the soil and has become accumulated on a bowl of bedrock situated 2 meters from the surface. The sea level has risen and at the time of high tide the exposed bedrock has become contaminated. Mr. Alafaio informed us that the first land measurement was taken in 1996. He also told us that Tuvalu does not have earthquakes because the land itself sits on very stable, hard bedrock.

Participants also questioned how human waste was treated in Tuvalu. Mr. Alafaio explained that some was composted into fertilizer, while other waste was absorbed naturally into the soil.

Next participants questioned how land loss influenced people's lives. Mr. Alafaio explained that land parcels are owned by each family, but the government has left some land as crown land. At the time of independence

in 1977, the population was 7,000, but the population has now grown to 12,000, putting further pressures on an already dwindling land area. Domestic disputes over land claims are now becoming a serious issue in Tuvalu. As a result of overcrowding, some residents are now migrating to countries such as New Zealand. Still, there is increased urban sprawl in some areas, yet other areas are on the brink of becoming ghost towns.

The team walked around the village and found a solar panel electric battery. At one time, there was a company that installed solar panel batteries in public and residential areas. The company has since left Tuvalu, but solar panel batteries are still in use in the Funafala Islet.

13:30-14:00

On the way to Fualopa Islet, the boat stopped for the team to observe an underwater reef. Then the boat moved ahead to Fualopa Islet. On Fualopa Islet, the team experienced strong waves crashing into the shore facing the lagoon. Then, the team walked around the islet.

Mr. Semese Alafaio led us to the places where the team could learn about the topography and other physical characteristics; for example, the white beach was not a sandy beach, but composed of the carcasses of coral and seashells. On the beach, a lot of creatures, mostly crustaceans, scurried along the sand. On the other side of the islet facing the open sea, a school of fish was observed.

14:30-15:00

The boat reached Tepuka Vili Vili. Mr. Semese Alafaio explained the islet is now small with only one tree stands at the center of it. Tepuka Vili Vili used to have more land area, and the bedrock did not used to be exposed. At that time, there was more soil cover and plants flourished throughout the islet. Gradually, the coast became eroded, and now Tepuka Vili Vili is disappearing.



(Fig. 9-4 Tepka Vili Vili, the island severely eroded)

15:00 - 16:00

The boat reached Tepuka Islet. Mr. Semsese Alafaio showed us the coconut trees along the coastline. Some stand firmly rooted, some are inclined towards the ocean, and some are already toppled over. Wave erosion has eaten away at the coastline, making the land less suitable for coconut trees.



(Fig. 9-5 Coconut trees leaning and falling by sea shore erosion, in Tepuka Island)

DAY 10 (18 March 2008) Visit Tuvalu Electricity Corporation, Water and Sewage department (Fresh Water Supplying Facility), The Government of Tuvalu , Hospital / Exchange Programme with USP Tuvalu Centre

8:15-8:45

Visit Tuvalu Electricity Corporation

The team walked to the Tuvalu Electricity Corporation which is located just across from the airport runway. Mr. Mafalu Lotolua, Officer of Tuvalu Electricity Corporation, gave the outline of the power generation system in Tuvalu. They have 900 customers in Funafuti and 600 customers in the outer islands. In 1982, when they started the service, it was only in Funafuti, and in 2000, the outer had built a generator. The electricity nowadays is used for TV, refrigerators, and other appliances, which has led to increased demand in Tuvalu.



(Fig. 10-1, 10-2 in Electricity Corporation)

Mr. Mafalu Lotolua answered questions about energy consumption in each household. He said that the generation of electricity is dependent on household energy consumption; the cost of consumption from 0 to 50 units a month costs 28 cents per unit, 51 to 100 units a month costs 35 cents per unit, over 100 units a month cost 55 cents per unit. The average family uses 50 to 60 units a month, which is the equivalent of 14 to 21 Australian Dollars (AUD) a month. The amount of usage is increasing 6% yearly.

The team asked about how electricity was created. Mr. Mafalu Lotolua said they use crude oil for thermal power generation. They buy crude oil from BP (British Petrol). The cost of crude oil has risen recently. For example, in February 2008, the cost was 1.45 AUD per liter, and in March 2008, it had increased to 1.50 AUD per liter. The country is looking at using renewable power such as solar and wind power in the future, and putting

them to practical use. A solar project by the Japanese government and E8 companies (a network of electrical companies from the G8 countries) has been undertaken, and there are now 20 solar panels. The project supervisors have been monitoring the situation and after one year will produce data on the project thus far.

There are two generators in the company and the maxim generation is 1800 kilo watts per day. The average consumption of electricity is 800 kilo watts per day. At present, they use only one generator unless the other one is required.

9:00-9:30

Visit the Water and Sewage department (on Fresh Water Supply)

Mr. Pisi Seleganiu, the Supervisor of the Water and Sewage Department under the Public Works Division of the Government of Tuvalu, welcomed the team and briefly explained the water situation in Tuvalu. The people of Tuvalu depend on rain water for their daily life. They usually do not use Fresh Water from there, but they depend on it at time of drought. Tuvalu has both a dry season and a rainy season. The dry season used to be from April to September. It, however, has changed over the last ten years because of climate change. And now, the dry season is from April but lasts for only one or two months.

The desalination plant is situated along the coast south of Governor General's residence in the center of Funafuti. The fresh water produced there is checked by the health center before going to public.



(Fig. 10-3 in Fresh-water Supplying facility)

Mr. Pisi Seleganui then explained how to make fresh water out of sea water. The outline of the process is: (1) The seawater goes through a rough mesh, (2) a semi-permeable membrane filter is then used to remove sodium ion. NaCl is removed at the filter. Freshwater can be made by filtering seawater through the membrane. In addition, highly concentrated salt is made from the extracted NaCl. Both the rough mesh filter and semi-permeable membrane filter need to be changed every three months, and it is reused as rope to tie the toddy bottles to coconut trees. The semi-permeable membrane filter is cleaned using chemicals. They are imported from Japan, at roughly US\$5,000.00 per meter.

The water produced is delivered to local areas via a water truck, and people can buy the fresh water at a rate of 1,000 gallons for 16 AUD. He showed us one of the trucks outside of his office.

The government supplies a 1,000 gallon tank of rain water for each family. If people want more, they need to buy a 1,000 gallon tank at a cost of AUD 1780.00, or they can buy a 2,200 gallon tank, at an even further additional charge.

10:00-10:50

Visit Department of Natural Resources and Environment

Mr. Mataio Tekinene, Director of Environment, Ministry of Natural Resources and Environment, briefly explained about the conservation area which the team visited the previous day. The Conservation Area project is a project run by the South Pacific region. The project began because people discovered biodiversity was decreasing and diminishing caused by over-harvesting of local resources. The project started in 1996. The purpose of it was to maintain land, air, and ocean diversity.

The project introduced rules which residents of Tuvalu should follow, and these were incorporated as several acts. The conservation area which the team visited is now managed by the Funafuti town council, and laws in the area are enforced by the Funafuti police. The job of the government is to give technical advice when asked.

The government plans to run an eco-tourism programme. Everyone who visits the Conservation Area must pay an entrance fee which is used for conservation work, and a tour guide ensures that no harm is done to the environment.

The participants questioned as to how the Conservation Area was chosen.

Mr. Mataio Tekinene Mataio explained the “National Environmental Management Strategy” which requires proper consultation. Firstly, Funafuti town council assessed the places with data to identify a place suitable for the Conservation Area. Then the government investigated and identified a suitable spot. Next, a report was submitted to the government, with endorsement and actual procedures forthcoming. After that, the government consulted and negotiated with the whole community, including fishermen, women’s groups, men’s groups, and so on. Collectively, they reached an agreement.

Another question arose from the participants related to illegal dumping in the southern part of Funafuti Islet witnessed by the team. Mr. Mataio Tekinene replied that it was an illegal dumping area. The government has

enacted laws to be enforced by each town council. The area is managed by Funafuti council and their agents. Unfortunately, the Funafuti town council lacks equipment and has no proper management system. He also explained about a landfill area in the northern part of Funafuti islet. He then introduced the “Waste Management Project Unit” under the Ministry of Home Affairs and mentioned that they are trying to stop dumping and make improvements.

He went on to explain in further details about the illegal dumping area. People from outer islands moved to Funafuti to look for jobs, but most property was already owned by land owners and the people could not find proper places to settle and ended up squatting. Further, there are health problems in the illegal dumping area. The government realizes the dumping problem and is hoping to take action. However, there are several problems:

1. There is no government held land, excluding a small runway for airplanes;
2. More and more people are migrating to Funafuti islet from outer islands to look for jobs, leading to population increase;
3. The government does not have sufficient budget, and still needs funds for development.

The team continued to exchange views with Mr. Mataio Tekinene regarding the situation in Tuvalu. People from outer islands want to come to Funafuti, the capital, to earn school tuition, and teenagers want to enjoy night life at pubs. 30 years ago, when people were living a more traditional life, money was not so important. Since then, modernization and westernization have crept in, and people are seeking these ideals. Tuvalu has not yet developed, but the peoples’ mindset has changed and they desire a more developed way of life. The government endeavors to provide education for all children in order to develop the future of Tuvalu.

11:00-11:20

Visit Acting Attorney General

Mr. Saaga Talu, gave an interview to the team. The question was made by Ms. Aki Koga, a student who majors in environmental law.



(Fig. 10-4 in Mr. S. Talu's office)

There are customs with according custom laws in Tuvalu daily life. Laws are passed by the parliament and become acts. Also, Mr. Saaga Talu mentioned that Tuvalu has a constitution and a supreme court. A bill of rights has been written in the Constitution. The Tuvalu Constitution mentions Christianity, as well as Christian values, and the constitution and laws cannot be separated.

There are still customary differences between men and women in Tuvalu in regards to inheritance, land title, and so on. However, men and women share equal human rights in all other ways. On another point, there are no light and noise control laws in Tuvalu. He finished his interview by saying "Tuvalu for God, and God for Tuvalu."

11:40-12:40

Visit Princess Margaret Hospital

The Hospital is situated about 1.3 kilometers north from the centre of Funafuti, and the hospital building was funded by the Japanese Government. Mr. Stephon Homasi, a doctor at Princess Margaret Hospital, agreed to an interview with the team. The request was made by Mr. Kiyoshi Yoshimizu, a student who majors in international nursing.



(Fig. 10-5, 10-6 in Princess Margaret Hospital)

Mr. Stephon Homasi gave a brief introduction of the Prince Margaret Hospital. The hospital has a total 50 beds, 1 surgery room, 3 main wards which accommodate 10 patients in each room.

Then Mr. Stephon Homasi gave an overview of medical facilities in Tuvalu. There is one main hospital, Princess Margaret Hospital in Funafuti. Each of the eight other islands has one medical center each. There are seven medical doctors for the whole country. Each medical center has four nursing staff members, including a mid-wife, general nurse, sanitation officer and nursing assistant. Sanitation officers look after water, toilet, and rubbish problems. Vaitupu Island which has a secondary boarding school of 600 students provides one nurse and one nursing assistant, for a total of six staff members in the whole community.

The biggest health problem in Tuvalu is heart disease, and it is the leading cause of death. Heart disease is closely followed by diabetes and high blood pressure. Tuberculosis is on the decline, and there are only between 12 and 15 new cases per year at present. During the 1980s, there were on average 36 cases per year. HIV was first recorded in 1995 and there have been 10 cases since then, which is high considering the population. Two of these carriers have already died, and eight are under treatment. A survey was administered in 2005-2006. It was believed that pregnant women, seamen, and youth between the ages of 15 and 24 were at highest risk of contracting the virus. For young people, partaking in a two part general knowledge and behavior survey was made mandatory. Out of

114 pregnant and 209 seamen, the research showed that none had been infected with the virus. However, the data indicated that 17.5 % of pregnant woman suffered from Chlamydia and 8.0% of men with Chlamydia demonstrated a latent possibility of HIV. In regards to the South Pacific, there are higher percentages of HIV, as well as sexually transmitted disease (STD) by Chlamydia and hepatitis B in Kiribati and Samoa. They are trying to reduce it in 5 years programme 2008-2013.

Dr. Stephon Homasi responded to a question in regards to the influence of environmental problems on disease. He responded as follows:

1. Climate Change

When there is no rain and little water, diseases increase. The diseases infected by water are dysenteries and choleras. But it is not anymore. Kids need to learn that flush water is no good , hand wash before eating.

2. Rising Sea Level

Eating habits have been influenced by the sea level rise. Nutritious food is not as abundant as before. Further, poor nutrition is leading to blood and blood vessel disease.

3. Cyclone Impact

Cyclones possibly bring contaminated rain-water from south-east Asian countries.

Participants asked whether herbal medicines and treatments were used in Tuvalu. Mr. Stephon Homasi answered that people still use some traditional, herbal treatments. Some are good, but doctors do not recommend them. One problem is that some traditional healers do local surgery which is dangerous, and could lead to infection. Therefore, such practices are banned. It is difficult to know when to stop using such traditional treatments and who should decide when to stop using them. The traditional treatments have limits and it is important for the doctors to let the residents know those limits.

The participants asked whether there are many cases of skin cancer as a result of the dangers of increased exposure to ultra-violet radiation. Dr.

Stephon Homasi answered that there are many cases of gastric cancer caused by a diet of dry fish, as well as many cases of lung cancer caused by smoking. However, peoples' naturally dark complexion helps protect them from the sun's dangerous rays, thus, resulting in few cases of skin cancer.

The participants asked if there were any risks of disease for people who lived in the areas of illegal dumping. Dr. Stephon Homasi answered that children get infected and complain of itchiness, as well as asthma from secondhand smoke from adult smokers. The hospital and medical centers are, now, educating people living those areas how to better treat waste and raise their children.

The question arose whether everyone gave birth at the hospital or not. Dr. Stephon Homasi answered that all the women on the main island give birth at the hospital. Women think it is safe to give birth at the hospital nowadays. For women living on outer islands, they at least give birth to their first child in the hospital. If women wish, they have no risk factors such as high blood pressure or diabetes, they are taught how all the procedures are done, go for regular check ups, and are given a choice of natural, traditional birth on their own island or hospital birth on the main island.

After the interview, nurses took the team for a hospital tour. They escorted us through the men's and women's ward, ICU, infant room, surgery room, nurse's station, and so on. They explained that there are no hospital fees for citizens of Tuvalu, and even transfers to hospitals in Fiji and New Zealand are free, as well as outpatient treatment.

Participants asked about care for the elderly. A sister at the hospital answered that hospitals only accept those who are sick. Infirm elderly people are taken care of by their families. Further, there are no nursing homes for elderly people in Tuvalu.

Participants asked about what is done with medical waste. The senior nurse explained that they used to have an incinerator outside but not any more, and they now collect the medical waste and dump it in a landfill. When questioned about the dangers of hypodermic needles, she answered that wastes are incinerated and that the points are melted to make them dull.

14:30-16:30

USP Tuvalu Campus

After lunch, the team moved to USP Tuvalu Campus which is located about 1.2 kilometers north from the centre of Funafuti. Mr. David Manuella, Centre Director of the University of the South Pacific centre in Tuvalu, welcomed the team and led them to a classroom where students were taking a university foundation course.

Mr. David Manuella welcomed the team and gave a brief overview of USP centre in Tuvalu. There are presently about 260 students enrolled, and they are hoping to increase enrolment to 300 students in the future. The number of students attending from outer islands is increasing. They are hoping to set up satellite campuses in outer islands to enable students from outer islands greater access. About 30 USP students participated in the exchange. They were aged 17-18.

Professor Toshiya Okajima from Saga University made a thank you speech for accepting the team for exchange.

Then Mr. Maho Homasi, the host instructor who supported the exchange, divided the Tuvalu students into 5 groups. Two Japanese students joined each group, and we participated in an intercultural exchange discussion.

Group 1: Yuko Kikukawa and Kiyoshi Yoshimizu and 5 of the Tuvalu students

They talked on the topic of sea level rise. The Tuvalu students thought Tuvalu might sink in 10 years, and expressed fear of such event occurring. However, they did not seem overly-concerned as they have not noticed much change in their daily lives because of the rise in sea level. On the other hand, if it happens, they would like Japan to help in accepting the refugees from Tuvalu.

Tuvalu students indicated dreams to be teachers, nurses, chemists, and accountants. If they get scholarships, they are provided 75 dollars every

fortnight. The Japanese team taught how to make origami.

Group 2: Aki Koga and Sayaka Shibata and 6 of the Tuvalu students

They talked on the topic of student life. School is from 8:00 A.M. to 17:30 P.M. The subjects they study include geography, sociology, history, English, and so on. They always speak in the Tuvalu language and find it a little hard to speak in English. Some students want to be teachers. When asked “What is the most important aspect of being a primary school teacher?”, a Tuvalu student answered “To be Patient”. Some of the students had already visited the USP main campus in Fiji. They are interested in foreign countries and plan to go overseas in the near future.

Many Tuvalu boys are shy whereas Tuvalu girls are, generally, not shy. If they become refugees, they hope Japan will accept them.

Group 3: Nami Nakahara, Sayaka Mukai and 6 of the Tuvalu students.

We discussed mainly waste problems. We learned from the USP students that the waste problem started in the 1990s when landfills were made. Waste is collected twice a week from each house and carried to landfills. The waste from illegal dumping areas is collected and carried to landfills, but the waste problem has become too enormous to clean everything up now. The USP students and their families are aware of the waste problems. They have learned about these problems in their homes, but do not know what the solution is; neither do people from the outer islands living in illegal dumping areas; nor does the government. Further, people do not seem that concerned, so nothing is changing in these regards.

In Form 6, at the age of 15 or 16, students who take geography study about environmental problems, including the waste problem and effective solutions. Unfortunately, students who do not take these geography courses do not learn such things.

In Tuvalu, students start to learn English from first year of elementary school. Other subjects include spelling, science, math, health, social science,

PE, and Tuvalu language studies. The textbook is written in English, but the teachers teach in Tuvalu language in order for students to understand, but note-taking is done in English.

Group 4 : Nanae Oshima , Emi Hideshima and 6 of the Tuvalu students.

Some Tuvalu students think Tuvalu will sink, and would like Japan to accept Tuvalu people. Other students believe in the Bible and they do not think Tuvalu will sink. They are interested in social studies, and some students are interested in Japan especially the volcanoes and the effect or the impact of them. They are planning to go to university. That also enables them to be independent from their families.

Group5 : Yuko Kikukawa, Kana Hideshima and 6 of the Tuvalu students.

Tuvalu students do not want Japan to make the problem any worse, yet they appreciate Japanese funds and technology assistance. The most popular dream that Tuvalu students hold is to study abroad. The reason is that they would like to earn more money after their studies. Also they would like to get out of Tuvalu to see the world. Some students complained about the religious constraints in their country, especially in regards to the roles between boys and girls. They are quite interested in western fashion. Lastly, students date at schools as they do not want their parents to know.



(Fig. 10-7 Exchange with USP students)

After the discussion, afternoon-tea was prepared by USP Tuvalu Campus, and the students engaged in free exchange. Mr. David Manuella added before we left that there was a waste management project between the Tuvalu and Australian governments which we would visit next.

17:00-17:30

Landfills

The team went up to the north end of Fangafale Island to visit two landfills. One was the project between the Tuvalu and Australian governments. A bulldozer pushed the waste to the edge of the landfill. Parts of the landfill were quite high and covered in soil with plants growing on it.



(Fig. 10-8 Landfill 1, in northern part of Fangafale island)

The landfill had all sorts of waste as there is no rubbish separation system yet.

Mrs. Syla Taafaki-Tevao explained the waste collection system in Funafuti. There are sections where the government or Funafuti council sends collectors to pick up waste in bags. Each family section is collected once a week.

Then the team moved up north to visit another landfill (Funafuti Council Landfill). It was a strip of long narrow land. There were many non-combustible items such as plastic diapers, and cans all mixed together. The waste was strewn on the lagoon side of the road, and the outer ocean could be viewed on the other side of the road.



(Fig. 10-9 Landfill 2, in northern part of Fangafale island)

DAY 11 (19, March, 2008)

TMTI Visit / Department of Education Meeting

8:00-13:00

A boat from TMTI (Tuvalu Maritime Training Institute) came to the wharf near the Vaiaku Lagi Hotel and took the team to TMTI. TMTI is in Amatuku Island which is one of the Fuafuti islets just north of Fangafale.

Captain Usunagafono, TMTI, welcomed the team and gave a brief overview of the activities.

Officer Mr. Puga Naseli, TMTI, gave the TMTI tour. The tour started at the generator building. TMTI has a generator, which is run off a diesel engine.

Next, we went to the seashore where the land had been eroded. Mr. Puga Naseli indicated to us the extent of the coastline of 20 years ago. TMTI staff members have been trying to stop erosion by planting plants along the coastline. Then we walked to the south end of Amatuku Island where you can see the north end of Funafuti Islet. The bedrock was exposed in the area where soil and sand used to cover. People used to be able to walk between the two islands when tide was low, but not anymore.



(Fig. 11-1 Bedrock between Funafuti and Amatuku Island)

Mr. Puga Naseli answered questions raised by the participants related to TMTI. He said that there are 60 students enrolled at any given time. Ever four months, new 20 students come in, and they spend first 4 months at school, followed by 4 months on a ship at sea, and finally the last 4 months are spent at school again. All the students are sponsored by a Tuvalu government scholarship which covers the tuition of 7,500.00 AUD. Aged 17 to 25 year old boys can apply, and the acceptance rate is about 20%. Applicants need to take a math and English test, as well as complete an interview.

Next, we went to see a vegetable garden. All sorts of vegetables were growing there. TMTI keep pigs in a pigsty and use pigs manure as fertilizer. Mr. Puga Naseli showed the first methane gas project in Tuvalu that they did co-jointly with France. The manure from the pigsty is collected. Leaving the manure in the septic tank specially made for the gas for a long time, it converts into methane gas. There is a hose to carry methane gas, and it is used in TMTI. They could make a barbeque using the methane gas. They are now extending the experiment to include human excrement to generate methane gas.



(Fig. 11-2 Methane gas generating project using manure from the pigsty)

After that, we went to a complex for drill training. The inside of the building is designed as the interior of a real ship. The complex is used to carry out all sorts of drills, such as fire drills, emergency drills, and so on, depending on the purpose of the class. For the fire-fighting drill students are put inside a chamber with the door sealed. After the fire is lit, the group has to determine what kind of fire it is, and choose the best way to extinguish it. Each group is timed and checked to see if they use the right chemicals to stop the fire. Mr. Tusaga Iosefa (Marine Instructor) and Mr. Steve Bonnor (Auditor) said all the training is based on real situations.

At 10:20, 20 TMTI senior students gathered for an exchange. The students and our team were divided into 4 groups to have free discussion.

Group 1: Sayaka Shibata, Kumiko Shinohara and 3 TMTI students.

TMTI students mentioned that their subjects include engineering, steering, deck work, catering, English and math. Catering is essential as seamen need to cook on the ship. They also have long-distance swimming training in the morning. Taiwan, China, Germany, Poland and other countries' companies are employing the TMTI students. Now lots of

students are employed by a Taiwanese Company, Yang Ming. They are willing to work for the sake of their families. They are scared of cyclones because houses and trees are often blown away.

Group 2: Aki Koga, Emi Hideshima, Yuko Kikukawa and 3 TMTI students

The Japanese students asked questions, and TMTI students answered them. TMTI students said that they want to be seamen because they need to support their families financially, and, also, would like to visit other places in the world. Four months training on the sea is a tough, frightening experience and they cannot wait to be back on land.

They have noticed the influence of climate change on rising sea levels, especially at high tide. Some of them think that Tuvalu will sink, but others think that it will not sink based on biblical prophecies. The methane gas generator costs 3,000 AUD.

There are no quarrels in TMTI, and the trainees gets along quite well.

Japanese students asked TMTI students to show their diaries. It has a part which educate them how to avoid the infection from HIV.

Group 3: Kana Hideshima, Nanae Oshima, Nami Nakahara and 3 TMTI students

TMTI students mentioned that seniors are mainly studying how to tie ropes, how to operate engines, and catering. They have daily morning swims in the sea which they found the hardest part of the school programme. They live in a dormitory but are allowed to go home on holidays. Some boys had unstable family backgrounds, and they want to support families by becoming seamen.

Group 4: Kiyoshi Yoshimizu and 5 TMTI students

All the TMTI students were scared of the influence of rising sea levels, but they do not believe that Tuvalu will sink. In their daily life, they do not feel much change caused by rising sea levels. Long hair is forbidden in TMTI.



(Fig. 11-3, 11-4 Exchange in TMTI)

At 11:20, 20 TMTI junior students gathered for an exchange. The students and the team were divided into 5 groups to have a free exchange.

Group 1: Kiyoshi Yoshimizu , Emi Hideshima and 5 TMTI students.

The TMTI students explained that they had to get up at 5 A.M. and have a swim in the ocean every morning. They can go home on weekends, but they can only visit between 10 A.M. to 5 P.M., and can not stay over night.

Group 2: Sayaka Mukai , Aki Koga, Kumiko Shinohara and 4 TMTI students.

The TMTI students explained that they sleep in dormitories now, but while it was under construction, they slept in the classrooms. The sailor cap is the symbol of their pride, and it can not be worn easily. All students become seamen. They discussed the influence of climate change. The TMTI students had witnessed waves coming to the edge of the land in 1998, but they were not causing erosion then. They also have felt the influence of more intense solar radiation and more frequent squalls recently. They believe that global warming is happening and that one impact is inland flooding, particularly during high tides in January. They, however, do not believe that Tuvalu will sink in the future.

Group 3: Sayaka Shibata, Kana Hideshima, Nanae Oshima and 4 TMTI students

TMTI students mentioned that they take turns at preparing classes. One example is preparing ships for the classes. Regarding marks, no one fails. However, if they do not succeed on a test, they cannot go home on weekends. In their free time, such as at recess and lunch, they like to work with mechanical devices.

Group 4: Nami Nakahara, Yuko Kishikawa and TMTI 4 students.

All the TMTI students happened to come from outer islands such as Nukufatau, Nui, Niutao, and Nanumea. Therefore, the questions from the Japanese team focused on the way of life on the outer islands. The TMTI students told the Japanese group that people are still living a traditional way of life, which is less wasteful and more ecologically friendly. When questioned whether they knew that the sea level was rising, one student replied that he had heard about it on the radio. When further prodded as to whether they are afraid or not, another student answered that he has no worries as God will protect them. Also, people in outer islands have learned how to adapt to change caused by rising sea levels. For example, they build houses on stilts. A fresh water shortage used to be a problem because ground water contained salt which made both plants and people sick. Now people collect leaves to make a soil mound for growing taro. Taro is damaged only when the root is soaked in salty water. When the eatable root is buried in the mound, there is no damage. Now each house is provided with a rainwater tank by the government, and also each village has a huge water rainfall collector which can provide more than enough fresh water to villages. Overall, the people in the outer islands are happy with life and the students explained that they prefer to live in the outer islands to the main island.

After the exchange, TMTI prepared coconut juice for refreshment and we had some free discussion time with TMTI staff.

13:00 - 14:00

At 13:00, the boat left TMTI and the team came back to the wharf at 14:00.

15:00 - 16:30

The Department of Education granted an interview with the team. The meeting was held with Ms. Katalina Taloka, Director of Education, Mr. Lapana Ene, School Supervisor, Ms. Valisi Tovia, Curriculum Supervisor, Ms. Evotia Tofuaola, School Supervisor, Ms. Teimana Avanitele Early Childhood Care and Education Officer, Ms. Maseiga Osema, Senior School Supervisor.



(Fig. 11-5 in Ms. K. Taloka's office)

A student asked about environmental education in Tuvalu, and Mr. Valisi Tovia, Curriculum Supervisor responded. The syllabus is written with all courses in mind, and environmental issues only make up a small part of it, but the developers are presently trying to integrate more environmental issues in with the social studies classes. Environmental studies cannot be considered a separate subject at present. Still, children should be taught about climate change. Periodically, the officers visit outer islands and collect data on environmental issues, and hope to use this data in future classes.

A student asked why environmental issues are not taught in families. Ms. Katalina Taloka, the Director of Education, explained that people believe in God, and in the bible, there is a promise that “He will not make flood again for His people. And His promise can be seen in the rainbow.” and “God also

taught that people play a part in taking care of His land and are able to make changes for the better.” Accordingly, people have a responsibility to look after nature properly. For example, if people do not take care of nature, the ozone hole will become bigger.

A student asked how environmental education should be taught, and a school supervisor answered. The Department of Education made leaflets and posters for schools to use, however, those were not used effectively as teachers did not know how to use them. What the officers are aiming to do now is to teach students environmental issues through integrated studies as children learn more through observation and hands-on learning. For environmental studies, it is more important for children to see authentic pictures about what is actually happening. Further, teachers should teach about the causes of environmental damage and that without a concerted effort the problem will grow worse. The education system is trying to teach “Do not create fire, otherwise, more CO₂ will be generated, which will lead to a rising of the Earth’s temperature, and the melting of the polar ice caps.” Anyway, experiential learning is the key.

A student asked about obtaining a teacher’s license in Tuvalu, and a school supervisor responded. The Department of Education employs teachers with a recognized teacher’s license. Tuvalu has no teacher training schools. As a result, future teachers have to go to universities in Fiji, Tonga, Samoa, New Zealand and so on. Lastly, there are various levels of licenses for teachers such as certificate, diploma, and bachelor.

A student asked about adult education, and Ms. Katalina Taloka replied. The education of adult is administered by woman’s groups and, also, the Department of Home Affairs is contributing, as well. As for environmental issues, the Department of Education helps students and expects them to talk with their parents at home to raise awareness among the older generation. As for additional adult education, there are community classes for young adults to study life skills such as cutting, and toddy making. The Department of Home Affairs sometimes goes to outer islands for workshops and stays there for a few days. Each workshop is different and covers

different topics. In order to run these classes, the community needs specialists in environmental issues, mangrove projects, health care, teaching, and so on. Officers from the Department of Education often accompany these specialists into the community.

A student asked if there are enough teachers. Ms. Katalina Taloka responded that there are enough, but they would like to have more specialist teachers in environmental studies.

A student asked about scholarships in Tuvalu. A supervisor replied. Most students on scholarship return to Tuvalu and work for the government. The Australian and New Zealand governments are contributing to develop human resources, and Japan is presently hosting Tuvalu on scholarship.

A student asked about the percent of national budget allotted for education. Ms. Katalina Taloka noted that the number one expenditure was education, followed by communication and transportation, government officials, health care, natural resource, and environment, respectively.

The Department of Education officers mentioned that content courses for children should be increased. A student asked if there were enough study hours to cover all these subjects. Ms. Katalina Taloka mentioned that they extended the secondary school hours by two hours a day a few years ago. Now, there is the possibility that primary schools will extend school hours, as well.

A student asked what Tuvalu people do to maintain their culture and how they are reacting to losing their traditional way of life. Ms. Maseiga Osema, an early childhood education officer, responded. Firstly, according to her, the culture is disseminated through the family. Traditionally, Tuvalu families are extended. Local skills such as fishing are passed on through the generations either orally or through writing. Recently, nuclear families are increasing and that is having an adverse affect on family culture. There is no national organisation or system to record culture. Secondly, lifestyles have changed a lot, and people are learning how to cope with the change. Change is fine so long as culture is kept strong. However, change should be gradual. Presently, change is happening too rapidly.

DAY 12 (20, March, 2008) Inland Flooding / Closing Ceremony

The morning and afternoon, until 15:45 P.M., was used for individual research, as well as preparations for the wrap-up session.

15:45-17:00

Mrs. Sylia Taafaki-Tevao had checked the time for high-tide with the MET Office, and on 20th of March, the time for high tide was 16:26 P.M.

At 15:45, the team started to walk to the TUFHA conference room which is located just across the runway from the Filamona Moonlight Lodge. The land in front of TUFHA was dry but had a small puddle. Then we walked to the MET office, the Meteorological Office, located north of TUFHA along the runway.

Mr. Tauala Katea, the Director of the Meteorological Office, welcomed the team, and gave a brief introduction related to weather in Tuvalu. Generally, in Tuvalu, from September to April is the wet season and from May to October is the dry season. The time of the king tide is in January, February and March. It, however, has been irregular over the last 20 years. In the 1980s and 1990s, a “pool of seawater” was discovered in Tuvalu at the time of king tide. From 1999 up until present, a pool of water emerged with every king tide, and the area around the MET is covered with sea water. Mr. Katea predicts that climate change in the next 10 or 20 years will get worse and the area covered by sea water will spread. Tide gage measurement data from 1993 to 2007 indicated a trend of an increased height of tide by 5.6 millimeters per year, so it could likely increase to 5.6 centimeters in 10 years. The average height in Tuvalu is about 1.5 meters, so it is a real threat. Other changes include heavy rainfall, strong winds, and an increase in the number of cyclones. They all are notable in the wet season. Storms at the time of high tide or king tide bring big waves from the sea to the lagoon.

The questions arose from the participants if they have any protection from the weather. He answered that the Meteorological office announces

forecasts on the radio, and they have devised a disaster plan in conjunction with the government, police force and Red Cross. The Meteorological office has disaster relief group cooperating with the Red Cross and Public Works department which has electricians, mechanics, engineers, and architects.

Mr. Tauala Katea continued to talk about climate change which is causing the melting of polar ice caps. This is contributing to the increased number of cyclones, rising sea level, increased sea water temperature, and irregularities in weather patterns.

He also highlighted the influence of climate change on water supply, which is diminishing due to a decrease in fresh water. On the land of Tuvalu, there is more sea water than rainwater now.

16:30

At 16:30, the team started to walk back in the direction from which we came. The area, however, was now covered with sea water. The sea water was up to people's ankle, and the students either jumped into the pools of sea water or took off their shoes and socks to walk back.



(Fig. 12-1, 12-2 Inland flooding in front of TUFHA)

17:15-18-45

The team prepared for the Closing Ceremony.

19:00 -21:30 Closing Ceremony

Professor Toshiya Okajima, Associate Professor at Saga University, gave an appreciation speech for Ms. Katalina Taloka, Director of Education,

Ministry for Education, Youth and Sports, Government of Tuvalu, Mrs. Valisi Tovia, Curriculum Officer, Ministry for Education, Youth and Sports, Government of Tuvalu, Ms. Lanuola Fasiai, Tuvalu National Commission for UNESCO Officer, Mr. Mataio Tekinene, Director of Environment, Ministry of Natural Resources and Environment, Government of Tuvalu, Mr. Pisi Seleganiu, from the fresh water supplying facility, Ms. Syla Taafaki-Tevao, the guide, coordinator, and facilitator, designated by the Tuvalu Government, Travel & Shipping Consultant, TUVALU AIR TRAVEL & SHIPPING.

He briefly explained the procedures for the wrap-up session. Each student would make a 5 minute presentation on their one week research, and he asked the Tuvalu participants to write comments on each Japanese presentation.

A complete presentation paper is in section **III** of this report.

[1] Presentation by Ms. Nami Nakahara, majoring in economy.
“Rubbish Issue”

In her presentation, she highlighted the rubbish issue, and the contrast of rubbish with beautiful scenery. She emphasized the importance of cleaning up the environment in Tuvalu.

She encouraged Tuvalu people to: not to buy unnecessary things, buy the things which do not produce waste, and not dispose of items quickly.

She found the number of people who knew about environmental problems less than expected. She suggested a need for improvement in education through: (1) helping teachers improve their knowledge of Education for Sustainable Development by inviting specialists to Tuvalu, discussing teaching methodology, and sending teachers abroad to learn how to teach about sustainable development, (2) educating the public with open workshops on how to manage rubbish properly, (3) giving perks to people who do good acts to motivate others to combat environmental problems.

She finished off by saying that she would continue finding ways to solve problems in Tuvalu such as asking specialists for advice.

[2] Presentation by Mr. Kiyoshi Yoshimizu, public health nurse and medical student major in International nursing.

“Increased diseases related to daily lifestyle habits and waste products”

In his presentation, he referred to the diseases he observed at the hospital such as heart disorder, diabetes mellitus, hypertension and failure hear. To prevent these health problems, he suggested: to introduce regular public health examinations, including measurement of weight, blood pressure, and percentage of body fat.

He saw a person rummaging through garbage at a landfill which can be harmful to one’s health and suggested: (1) to enact laws related to waste collection and waste separation, access to landfills, and enforcement of these laws; (2) to install incineration centers.

[3] Presentation by Ms. Kana Hideshima, studying culture and history of Asia countries and international relationships between Japan and other cultures.

“The effects of westernization in Tuvalu” and “responsibilities of companies on waste”

In her presentation, she highlighted that environmental problems in Tuvalu are deeply connected to westernization. She referred to a book on TUVALU HISTORY she read in the Funafuti library. She discovered a rich culture in this book, and stated that people are losing their culture due to westernization. She suggested: to adapt western culture to fit in with traditional culture in Tuvalu just as Japan has been assimilating other cultures for thousands years to fit in with the Japanese system.

She found there is not enough land to treat waste in Tuvalu and suggested: to ask developed countries who produce waste to take responsibility to treat it properly. With international cooperation, Tuvalu will be better able to keep the balance between development and environmental protection.

She finished off by saying that ancient knowledge was the key to promoting sustainable development.

[4] Presentation by Yuko Kikukawa, studying environment and welfare.

“Care for old people” and “Information tools”

In her presentation, she highlighted the praiseworthy Tuvalu tradition of looking after elders in families. In Japan, care for the elderly has been shifting from a family to a public system as nuclear families have become the norm. She suggested for Tuvalu people to keep their tradition of the elderly and not to change like Japan to the western custom of nuclear families.

She heard that there are some lifestyle and environment-induced diseases in Tuvalu, and she said that public information was not enough.

She suggested for the government to inform people of these diseases and their symptoms via radio, posters, books/leaflets in libraries, schools and other public places.

[5] Presentation by Ms. Emi Hideshima, international culture course, majoring in literature of Japanese classics and Asian culture.

“Write about your own culture”

In her presentation, she talked about books written about Tuvalu culture. Firstly, there were only a few books written on Tuvalu culture. Secondly, most of these books were written by Europeans. Thirdly, there were no books written about different the cultures on outer islands of Tuvalu. She expressed concern that Tuvalu might lose its culture without having any written record. She suggested: (1) the government collect copies of family books and preserve them to pass onto future generations; (2) Tuvalu culture should be written by Tuvalu people to be preserved through their own eyes.

She mentioned the tendency in Japan for people to return to traditional culture in order to solve environmental problems. She finished off by saying that she wanted the Tuvaluans to notice the importance of their own cultures.

[6] Presentation by Ms. Sayaka Mukai, human and environment course.

“Global Warming and Separation of Rubbish”

In her presentation, she stated that the purpose of her visit to Tuvalu was to witness the effects of global warming. Some Tuvaluans say shoreline erosion has been occurring for a long time, while others say it is the recent effect of global warming. She mentioned that she hoped to deepen her knowledge to get to the heart of the matter.

She thought the most serious problem is the rubbish problem. She found plastic bags, nappies, in-flight meals, machines, and used cars all dumped altogether at landfills, although they are supposedly strictly controlled by the government and town council. To make improvements, she suggested: (1) the national government and Funafuti city council cooperate to find a solution; (2) if cooperation is possible, they could start separating rubbish into categories, such as flammable and nonflammable, plastics, bottles, cans, pet bottles, and so on; (3) if possible, recycled cans could be sold to foreign companies, thus, helping companies and decreasing rubbish in Tuvalu at the same time; (4) the government should show greater leadership in regards to the above proposals.

She finished off by saying that she should study more deeply about environmental problems after returning to Japan.

[7] Presentation by Ms. Nanae Oshima, studying culture and history.

“Overall impression on Tuvalu and communication between the government and local people”

In her presentation, she addressed the shyness of Tuvalu people, but found them very kind once they opened up. Also, she found it difficult acquiring a taste for the traditional food. She thought the conservation area was so beautiful and attractive. In the contrast, some of the seashores were littered with rubbish creating an eyesore for visitors. She suggested: (1) to have more traditional restaurants; (2) to make the conservation area more appealing; (3) to clean up the litter from the seashore. Thus, the relationship between the local people and government would be of vital

importance.

She finished off by saying that she would study harder about environmental problems and development processes upon returning to Japan.

[8] Presentation by Ms. Kumiko Shinohara, studying environmental technology.

“Water Pollution”

In her presentation, she compared inshore water with offshore water and she found the inshore water more polluted. The water is probably polluted from the discharge of human waste from the ground, as well as litter, both of which are harmful to people’s health. Human waste could be saved in septic tanks, and could be used to generate methane gas. She thought it was necessary to make a human and animal waste treatment system in Tuvalu in the future, and suggested: (1) to generate bio gas generation from methane such as they did at the project in TMIT which she thought was good, as it contributed to less oil consumption and greater sustainable development; (2) to compensate people with free bio-gas for depositing human waste; (3) to make compost (called *Ekahi* in Japanese) from human waste. In fact, vegetables and fruits taste better when grown in fertilizer from human excrement.

She finished off by saying that she would try to examine the best way to make compost (= *Ekahi*) when she returned to Japan.

[9] Presentation by Ms. Aki Koga, specializing in environmental law.

“Illegal Dumping and Land Conflicts”

In her presentation, she mentioned that watching illegally dumping reminded her of the Japan in the 1960s when environmental pollution became a big problem. Many people suffered from serious diseases because of pollution. Also, she brought up the terrible illegal dumping case in Kanagawa prefecture, on Shikoku Island, Japan in the 1990s. Many laws enacted as a result. She suggested: Japanese past experience might provide some valuable lessons for Tuvalu’s present environmental problems.

She also touched upon land erosion. She would like to have studied more deeply on environmental problems, but it was not easy to obtain documents and detailed reports, so she suggested: to write annual reports or documents of environmental problems and publish them throughout the world. At the same time, increase environmental awareness among the people of Tuvalu.

She finished off by saying that this exchange was not the end, but just the beginning of a cooperative relationship between Tuvalu and Saga University.

[10] Presentation by Ms. Sayaka Shibata, studying human and environment.

“Prevention is better than a cure”

In her presentation, she talked about an over-reliance on overseas countries. She discovered that most facilities necessary to live in Tuvalu, such as water, electric power, food and finance are supported by foreign countries. Increasingly, there have been serious repercussions because of climate change. Also, human health has been seriously harmed by environmental problems. She thinks Tuvalu should become more self-reliant.

She noted that a lot of nature had been destroyed in Japan as a result of human action and that it took a long time to recover. Once Japanese people thought economic development was more important than nature, but Japan has paid a high cost for economic development. She witnessed rapid development in Tuvalu and thought the people were getting too caught up in it. She is worried that they are forgetting about their traditional life more in harmony with nature. She suggested: (1) to introduce environmental assessments, and to change accordingly; (2) to recycle; (3) to put more emphasis on environmental education.

She finished off by saying that development which does not destroy nature is necessary, something which Japan has become aware of in retrospect.

After the presentation, Mr. Mataio Tekinene, Director of Environment, Ministry of Natural Resources and Environment, Government of Tuvalu, made comments that he appreciated the presentations and he consider environmental problems never-ending. Although the students came to study climate change, they expressed greater concern over the waste problem, and he acknowledged that there was a problem. He then suggested that students contact the government, NGOs, and institutions, and inform him on whether he could be of more assistance in tackling this problem.

Ms. Katalina Taloka, Director of Education, Ministry for Education, Youth and Sports, Government of Tuvalu, made comments that the students did a good job in their one week research. The rubbish problem is something of which the Tuvalu people need greater awareness. She also agreed that partnership is important to overcome problems at hand. She noted that many students discussed the values of traditional life, and she appreciated this point. She said that the points raised by the students were correct. Lastly, she requested to send copies of the speeches and videos to her so that she could advertise the team's project and discoveries throughout Tuvalu.

8:20 P.M. Reception

After the wrap-up, the participants had a reception and free discussion.

Then the traditional Japanese culture was introduced by the team. The chairman wore and introduced a traditional Japanese garment. Then groups of students demonstrated traditional Japanese games; *Kendama = scooping a ball with a cup*, *Koma = spinning top*, *Otedama = a beangag gam*, *Ayatori = cat's cradle* and *Te-asobi =singing accompanied by hand gestures*.

Then the team shared songs such as *Furusato = Hometown*, *Tsubasa wo Kudasai = Give Me Wings*, *Kiyoshi no Zundoko bushi = Japanese ballad*, *Shiawase nara Te wo Tatakou= If you are happy, clap your hands* and *Shima Uta = Island Song*.

After that, Professor Toshiya Okajima made the final speech and said that he appreciated all the participants' spoken and written comments. He added that the students will treasure they had which will lead to deeper research. He once again noted that this was the beginning of a longstanding relationship, and he hoped that the Tuvalu government, participants, and Saga University could continue a mutually beneficial cooperative relationship in the future.



(Fig. 12-3 Present a commemorative square piece of paperboard, in the reception of Closing ceremony)

DAY 13 (21, March, 2008) Depart Tuvalu / Arrive Fiji

The team checked in at 10:30 for flight PC602, departing at 12:30P.M. However, the plane was late. The team walked back to the Filamona Moonlight Lodge to have lunch before the immigration counter opened. The plane departed Funafuti Airport at 14:30P.M., and arrived at Nausori airport at 16:30P.M..

At Nausori Airport, a bus picked up the team and took them to the Upper Lodge at USP, Fiji. The team had dinner at McDonalds in front of USP Upper Lodge.

DAY 14 (22, March, 2008) USP Wrap-up session / Suva Market 9:00-13:00

Wrap-up session was held at USP lower campus with Dr. Eberhard Weber, Senior Lecturer in Development Geography and Natural Resources Management, head of School of Geography, USP, Mr. Fine Lao, fellow,

Climate Changes & ESD ,Pacific Center for Environment and Sustainable Development, USP, Mr. Leone Limaleve, Research Assistant, Pacific Center for Environment and Sustainable Development, USP, Mr. Alan Resture, fellow, Institute of Marine Resources, USP, Mr. Melchior Mataki, Pacific Center for Environment and Sustainable Development (PACE-SD), USP, in attendance.

Dr. Toshiya Okajima, associate professor at Saga University, made a group introduction to the USP attendance. He explained that each student will have 5 minutes presentation and 8 minutes comment and feedback from the USP faculties. Dr. Eberhard Weber introduced the USP faculties and explained the schedule of the wrap-up session in which the 1st part was the students' presentations and 2nd part was Open discussion.

9:30-12:30 1st part: Students Presentation

[1] Presentation by Ms. Nami Nakahara, majoring in Economics.

“The Rubbish Issue”

In her presentation, she highlighted the rubbish issue. She suggested that Fiji be aware of making an effort to reduce rubbish in three ways: (1) Education is the key to make awareness, (2) Educate the public, both students and adults. The more people who talk about the problem, the more people will be aware of it, and (3) The government should recognize people who make the environment better.

On Nami Nakahara’s presentation,

Mr. Melchior Mataki made comments that he agrees with her about the waste problems. The Pacific countries are suffering from waste problems. In the Pacific, people have not done what they can do on “Waste Problems” such as littering. Beyond that, a lot of items were brought into the South Pacific small islands countries which have limited resources or don’t have a system or place to collect or treat the items. As for the technical issues, such as looking at designing a landfill, people will dig a few meters and suddenly there is the sea. It is challenging to find a place to create landfills in the small island countries.

[2] Presentation by Mr. Kiyoshi Yoshimizu, a public health nurse and a medical student majoring in International nursing.

“The Overall impression of this Eco-Tour”

He emphasized people should live in a way that is friendly to the earth. Humans cannot live without destroying nature. While the old traditional way of life was earth-friendly, people want to lead a westernized life because it is convenient and comfortable. People have not been renewing the balance of nature caused by their destruction and he hopes that people might be able to manage this conflict. Also he found it hard to understand if the climate change and rising sea level is caused directly by global warming. The environmental issues are in a battle with earth and the sea and all the animals. People need to observe the earth condition to find earth-friendly actions.

On Kiyoshi Yoshimizu’s presentation,

Mr. Fine Lao made comments that the group came from all the way from Japan and to identify what the Pacific countries have. The Pacific countries can learn from the developed countries’ past which is the Pacific’s merit to their sustainable development.

Mr. Melchior Mataki made the comment that he was pleased to hear that the Japanese students' comments which serve to remind USP that it is within their power to work together to solve problems.

[3] Presentation by Ms. Kana Hideshima, studying the culture and history of Asian countries and the international relationship between Japan and other cultures.

“The effects of westernization” and “The responsibilities of companies on waste”

In her presentation, she highlighted that the traditional culture and western system does not coexist well in Fiji and Tuvalu. Villages in Fiji have such a lot of useful knowledge in life and their way of life produce no wastes because all material are recycled into nature. This is the key to keep sustainable development. Rapid westernization destroys traditional culture

and produces rubbish. She suggested: (1) asking the developed countries companies to take responsibility for waste produced by the Deposit System, (2) increasing environmental education. Teach that the traditional way of life has great knowledge to live with nature.

On Kana Hideshima's presentation,

Dr. Eberhard Weber made comments that traditional village items such as coconuts result in no pollution while the good products that come from outside do not go back to nature and need more treatment. As for waste management, in Suva, waste is collected 3 times a week, but in the villages, there is no system. One issue is that the government does not encourage people to do proper waste treatment. What is needed in the Pacific is the avoidance of rubbish, and education on reuse and recycling.

Mr. Alan Resture made comments that traditional cultural aspects for sustainable development were well captured in examples like coconuts which are multi-functional. Traditional natural resources work together in environment. One example is a Taro farm in Tuvalu where all the leaves around are collected in the big hall in the farm. It is true that western culture is destroying the system. We should think about how we live and think about how the environment can support us. Then we can reach sustainable development in the end.

Mr. Melchior Matakai made comments that people tried to introduce the deposit system in Fiji 2 years ago. But there was resistance from the industries. Kiribati is the only country in the South Pacific which succeeded in introducing the deposit system. They legislated a deposit system and now every can or aluminum can be recycled overseas.

[4] Presentation by Ms. Yuko Kikukawa, studying the environment and welfare.

“Care for old people” and “The Rubbish Issue”

In her presentation, she highlighted the good Tuvalu tradition of looking after the elders in families and suggested to keep the good tradition of caring old people. She also mentioned the environmental problems are also

related to health. The waste which is just put in a illegal dumping area, will be blown to the ocean and the sea will be polluted. The fish will be polluted, the people will eat the polluted fish. She suggested introducing a fine to people who dump illegally ,to educate people and preach through radio and posters.

On Yuko Kikukawa's presentation,

Mr. Fine Lao made comments that he appreciated that Yuko mentioned the good parts of the traditional life.

[5] Presentation by Ms. Emi Hideshima, international culture course, majoring in Japanese classic literature and Asian culture.

“Write your own culture”

She talked about the books written about Tuvalu culture. Firstly there were few books written on Tuvalu culture, secondly almost all of the books were written by Europeans, and thirdly there were no books written about different cultures in different outer islands in Tuvalu. She worried that Tuvalu might lose their culture without recording it, and suggested : (1) that the government collect the copies of family books and preserve these to pass on to next generation, and (2) that the Tuvalu culture should be written by Tuvalu people to preserve their own wonderful precious culture.

On Emi Hideshima's presentation,

Dr. Eberhard Weber made comments that her presentation has much truth. Fifty years ago, the culture was seen as negative while only the modern way was seen as good and positive. Today it is changed and the people should be relying on their own foundation and culture upon which people can build progress.

Mr. Alan Resture made the comment that he should write a Tuvalu culture book before losing cultures as he is Tuvalian. In his recent paper, he wrote on how to reduce natural disasters, losing culture, and acknowledging traditional medicines.

Dr. Eberhard Weber added comments: Cultures were imported from

outside and Pacific culture was written about by westerners from places like the USA or Germany 200 years ago. At the time no native was writing in Fiji and the culture was passed down through oral traditions. Then, missionaries came and reported that there are here people who need support and money. The Europeans were interested in money. Only after a half century, the Europeans reported how fertile the soil was and used that to attract Europeans to settle in Fiji. As in this story, culture can be invented.

Mr. Fine Lao made comments that the team came from far north, and has told us that the solution is here in the Pacific , not from outside. It is “good news”.

[6] Presentation by Ms. Sayaka Mukai, from the human and environment course.

“Global Warming, The Classifying of rubbish”

She had one week research in Tuvalu, and some people say that the sea shore erosion was caused by recent climate change and some people say that has been happening from ancient time. She can't say which is true because she has not seen the past and there was no data she could find. She found the rubbish a problem in Fiji as well because there was no classification system. She suggested: (1) garbage can become manure and fertilizer and be fed to animal and plants, (2) Empty cans can be collected and exports where recycle is possible. She finished by saying that the Fiji government and Japanese governments should recommend that people lead traditional life style.

On Sayaka Mukai's presentation,

Mr. Fine Lao made comments that Sayaka came to see the global warming effects in Tuvalu for herself and tried to grasp whatever the data available. What is important is that Mr. Fine Lao wants Sayaka to acknowledge the problem is true: That the Tuvalu people are affected.

[7] Presentation by Ms. Nanae Oshima, studying culture and history.

“How to bring more tourists to Tuvalu”

In her presentation, she presented what she saw in Tuvalu. And she suggested some ways to bring more tourists to Tuvalu: (1) more restaurants where tourists can enjoy Tuvalu traditional food, (2) make conservation areas more appealing by having tour guides, posters, and a home page, (3) to clean the seashore, so that no rubbish is there. To do these things, cooperation between the local people and the government would be important and things might work better.

On Nanae Oshima’s presentation,

Mr. Alan Resture made comments that he was pleased to hear of the potential in Tuvalu which he supports in Eco-tourism and activities. He pointed out that it is more expensive to go to Tuvalu than to go to Europe from Fiji, and there should be more choices.

[8] Presentation by Ms. Kumiko Shinohara, studying environmental technology.

“Water Pollution”

She compared inshore water with offshore water in Tuvalu and found the inshore water was dirtier. The water is probably polluted by the discharge from the ground which also be polluted with human waste, waste from rubbish, and that can influence the health of humans beings. The human waste could be saved in septic tanks and then used to generate methane gas. She thought about the needs of making human and animal waste treatment systems in Tuvalu, and suggested: (1) Bio Gas generation from methane, (2) to expand the gas generation from methane and introduce a deposit system, and (3) Make compost (called "*Ekishi*" in Japanese) from human waste.

On Kumiko Shinohara’s presentation,

Mr. Melchior Mataki made comments that liquid-based waste and plastic-based waste are causing water pollution which is not only in Tuvalu but in

Fiji and other South Pacific nations. That is also an issue of technology. The septic tank system is using the wrong technology. They dig the soil where the sea lies, and liquid causes the septic tank to overflow. Different places need different technology. In Buretu village, in the delta area, the students might have found the septic tank was built high above the ground because the water table is high there. A compost toilet is useful as it can save water because it uses less fresh water, and human waste can be turned into products. Some years ago government promoted flush toilets. Environmental technology students should know that sometimes wrong technology can be introduced to where local community people do not know it well. For example, in a coral island where a geographically-located water tank is used to collect fresh water, the government introduced the flush toilet which is a waste of fresh water. The USP staff tried their best to help them understand why a flush toilet is no good. It was challenging work.

Mr. Fine Lao made comments that scientists should work together on environmental issues and especially in the area of environmental technology. The issue is a global issue and continuous issue. The team came to see the problem was in the South Pacific, and maybe one day the team can come back with a design for the needs in the Pacific.

[9] Presentation by Ms. Aki Koga, specializing in environmental law.

“The Effects of Climate Change”

She talked about the self sufficient life in the two villages she saw. The life there seems easy and simple on the surface but it is neither easy nor simple because climate change is affecting their lives. It is causing flooding and erosion. Those are serious problems. On the other hand, the people found an advantage to it because more fish and lobsters are coming in. That idea left deep impression on her. She also mentioned some environmental problems she found in Tuvalu. They were illegal dumping, noise, inland flooding, erosion, and air pollution. Also, the land erosion is causing a “land conflict” among the residents.

On Aki Koga’s presentation,

Mr. Alan Resture made comments that the "land heritage" to generations and peoples coming in from outer islands to Funafuti is contributing to the increasing population problem. The main issue is the availability of land in Funafuti as people culturally are not able to cremate bodies after death.

Dr. Eberhard Weber made comments that among the Pacific atoll countries the center has the highest population density, 2000 people in one square meters, despite the fact that the center of the atoll countries are naturally the least logical place to handle a large population. It is important to deal with the land conflict. In the future the problem will grow. The international community should look closely and see how conflicts are settled and ask questions about how the mechanism works.

Mr. Fine Lao made comments that law is important especially at the time of change. It would be good for lawyers to help negotiate the changes.

[10] Presentation by Ms. Sayaka Shibata, studying human and environment, specializing in environmental technology

“Prevention is better than a Cure”

She is interested in environmental management for sustainable development and she compared Fiji and Tuvalu. In Tuvalu, she found Tuvalu is still under development, but it has already stagnated as western culture is coming in so fast that what they need in their daily life is dependent on imports and support from foreign countries. In Fiji, she found that villages are influenced by western culture, but they are still leading a self-sufficient life that also coexists with nature. She was interested in the “Common Assets” policy that contributes to the community. The monetary economy is, however, also exists within the society, and she found it is very difficult to carry on completely self sufficient life. She compared more on the land conflict, the balance of damage-causing and favorable climate change, the possibility of traditional custom co-existing with sustainable development and the method of using subsidies. She suggested keys for sustainable development are to “Consume in the area where a product is produced” and to “Share.”

On Sayaka Shibata's presentation,

Mr. Fine Lao made comments that Sayaka saw economic growth and developments which the Pacific countries are trying to maintain. But she also reminded the Pacific the climate change and wastes are problems. Pacific countries don't have enough money and most projects rely on external funding. Pacific countries should initiate their own projects.

After all the presentations and comments to each presentation were made, everyone took a break for morning tea.



(Fig. 13-1 Wrap-up session in USP lower campus)

12:30-13:30

2nd part: Overall Wrap- Up ,Statements from the facilitators

Dr. Eberhard Weber, announced that it was time to wrap-up the few weeks of the students visit to Fiji and Tuvalu. Firstly, the students will give their impressions on their experiences, and then the facilitators will give short statements. He also mentioned that even though it is finished for the moment , the few weeks of experience in the Pacific will remain in the students and the facilitators there also gained from the students visit.

Then each student made a statement, expressing their appreciation for being given the opportunity to come to Fiji and Tuvalu. They found that the environmental problem is connected with many other factors and that it is not simple to solve the problem. They expressed a willingness to study more

and do what they can do after going back to Japan.

Dr. Eberhard Weber expressed appreciation for the students' statements and made the following statements:

1. He hoped that the students learned the global climate change is best observed where the people live, and the impact is on people and people are affected such as Buretu , Tuvalu and other atoll countries.
2. What he wished the students to realize was “to change the change”. There are lots of changes including changing society. Changes need direction. Without direction, the problems will be bigger. To do this, it starts person-to-person, people talking about it, making other people aware of it, and educating people. Governments need to go a new way that includes making laws and maintaining the changes.
3. The international community including the developed countries such as United States, Japan, and Germany have contributed enough to produce the green house gases while these gases are not produced much in the Pacific. It is the industrialized countries’ responsibility to change their way as these problems are generated.
4. “How can these problems could be solved?” The only solution is that everyone contributes to the system on individual, community, national and global levels toward making the change. Although the reality is severe, he is optimistic and suggests “let the actions follow.”

Mr. Leone Limaleve expressed appreciation for the team visit to their programme site and made the statement:

1. The total of the South Pacific countries’ global emissions in the atmosphere is less than 0.03 % which is very small. However, the South Pacific countries are committed to the reduction of green house gas. The South Pacific countries have made a declaration and have made a target to reduce to a certain percentage by 2015. Although the South Pacific countries are seen to ask for funds or donations while negotiating at international conferences, they also committed to the reduction of the green house gas effect.

2. Buretu village people of all ages were happy to have the group. The village resources are limited. So the projects team made sure of the villages' building capacity to enable them to do the work by themselves even after the project. They also tried to find a way to adapt to the climate changes in a soft method which does not costs much.
3. There are six USP project sites. For example there is a water recourse programme site where they make the water flow to and from the house by making pipes. The Tokyo University of Technology helped them take the sediment gathered in the rainwater tank for purification and monitored the water as it collected. They also made sediment traps along the river for the reefs.
4. Climate change is only one of the stresses for the community. The project team always tried to understand the other stresses. He hopes the Saga university team will be one of his teams and go to the projects site to study. Since the team is multi-skillful, it is very important to get such a team to go to a project site and understand every aspect before implementing the adaptation method. Once the project team has implemented the method and there are other stresses, the community would stay back and the efforts would not work well. This is the reason why he feels it is important that the Saga University team be a part of their projects.

Mr. Alan Resture expressed his appreciation for the opportunity that is related to where he can contribute in Tuvalu and made statement:

1. The team identified Tuvalu has not only suffered the impact of global warming but also has water, health, traditional culture, education and aids issues. Tuvalu is only 30 years into its independence and still has a "colonial hang over" in which they rely on aid from overseas.
2. There are other immediate issues. One is population density. Four thousand people in Funafuti is a sign of overpopulation. This puts pressure on fish resources, water resources, land resources, the quality of education related to the number of students that one teacher can handle and health conditions as there is only one hospital . And he can always

link these agricultural, social, and health problems to climate change.

3. “Where does Tuvalu go from here? Does Tuvalu continue to rely on the international community? When the aid is finished, does Tuvalu search for the next step or wait for another one?” are the questions he asks himself. The students' presentations gave him the opportunity for him to reflect on these points.

He hopes Saga University continues this exchange and follows up and comes to see any change both for the better and the worse, and moves on from there.

Mr. Fine Lao expressed his appreciation that the team came in the challenging time of the South Pacific and made statement:

1. He was impressed with the range of research covered in a week. The students' presentations were encouraging for him and USP colleagues. The Saga University team came from North which has been seeing the climate change from a global aspect. The South Pacific countries that do not rely on materials as much as Japan and other developed countries must not make the same mistakes as those mentioned in the presentation.
2. He also was impressed how the students look at Tuvalu and Fiji from global scale. Climate change has been a heavy burden. The students came and saw the facts that the erosion was there, that Tuvalu was effected, and that the culture is civilized. The students' coming was encouraging for USP as they were able to see the process with them.
3. He expressed gratitude for the insight that there are some solutions in the South Pacific. The South Pacific can use their traditional and education system.
4. “Where do we go from here?” is also a question to him. And he requests the team write a report on how global change effects Tuvalu, etc. Any small information can help to find a way for their future. He hopes that the team comes back with “Good News.”

Mr. Melchior Mataki expressed appreciation for being invited to the discussion and made this statement:

1. The environmental issues are in waste management, water usage and include economic and culture aspects. One thing that the team can take into consideration is that there have been meetings between the Pacific leaders and the Japanese government leaders. Waste issues were talked about in 2000, but it is no longer the issue because climate change is the biggest global issue now. However, looking at the local level, there are still waste issues. We must consider putting environmental issues and social problems together.
2. Health is influenced by climate change like the HIV that is a threat in all the South Pacific islands. Environmental problems are like HIV. It causes a slow change and when the symptoms appear it is too late. Climate change slowly proceeds and gives subtle change. It slowly affects agriculture, the fishing industry and coral changes. That's why the government's response is slow or it does not catch the government's attention. It is challenging to reconcile these subtle problems.
3. The South Pacific countries must utilize their own resources and people need to take concrete action to address the governments. Although the governments are very poor, they must use their resources where they are needed. They are looking for outside resources to assist them, but it is "Sustainable Development" which is important.
4. He finished by asking the students "How do you reconcile these different objects such as Sustainable Development, economy and culture to former colonial countries like Fiji and Tuvalu?"

After the USP faculty's speeches, Dr. Okajima, professor at Saga University, expressed appreciation of their attendance and speeches and addressed that this was the starting points for the relationship between USP and Saga University, and closed the wrap-up session.



(Fig. 13-2 USP staff with commemorative square piece of paperboard)

14:00

After the wrap-up session, Mr. Alan Resture, fellow, Institute of Marine Resources, USP, and the team had an excursion to Suva market. On the way, the group had Fijian lunch at Old Mill House.

Suva Market is in the central part of Suva, and is recognized as the largest market in the South Pacific. The market is located in the rather unsafe section, so the students were told to hold their bags in front. The team were walked together, spoke no Japanese and did not take out cameras. (That's why there are no photos here.)

All of the participants walked from the fish market to where the sea products are put. A lot of the sea products seemed to already sold out since that morning. There were, however, shell fish and other products remaining. In the vegetable section, Yangona, Taro leaves, and many other fruits could be seen.

In the evening, the team had Indian curry at Maya Daba in Suva city.

DAY 15 (23 March 2008) Leave USP for Nadi

At 10:30, the bus arranged by Wilder Ethnic Adventures picked up the team.

The bus driver headed for Nadi. On the way, he explained what could be seen from the bus windows such as industrial areas, a natural orchid garden, and the land where the first Chinese settlers tried to grow the rubber trees, but failed to do so because the soil was not appropriate. He made a stop at Bravi Handicrafts where Fijian crafts were seen. Next, he made a stop at "Chicken Express" for lunch in Shingatoka. After that the group made a stop at Shingatoka Sandy Dune where the group took a walk.

At 17:00, the team arrived at the Capricorn Hotel, and had dinner at the hotel at 19:00. Then, the students were handed evaluation papers to fill out. The early breakfast sets were brought into each room.

DAY 16 (24 March 2008) Leave Fiji for Incheon, Korea

At 7:15, The Capricorn Hotel Shuttle bus took the team to Nadi International airport, and arrived there at 7:30.

At 7:40, the team checked in and departed Nadi at 09:40 for Incheon, Seoul by Korean Air flight KE822 and arrived in Incheon, Seoul at 17:30.

The shuttle bus from the hotel came to pick up the team at the airport. The team took accommodation at the Incheon Airport Hotel.

In the evening, the team had Korean food at a nearby restaurant.

DAY 17 (25 March 2008) Leave Incheon / Arrive Fukuoka, Japan

At 5:30A.M., the Incheon airport hotel shuttle bus took the team to Incheon, Seoul International airport, and arrived there at 6:00A.M..

The team departed Incheon, Seoul at 8:00A.M. for Fukuoka by Korean Air flight KE787 and arrived in Fukuoka at 9:20A.M. The team was dismissed at Fukuoka airport.

III Wrap-up Session Speeches in Tuvalu

Wrap-up sessions were presented twice, namely, both in Tuvalu and at USP in Fiji.

Here, only the ones spoken by 10 students in Tuvalu are presented.

Nanae Oshima:

My name is Nanae Oshima. Thank you for coming today. I study culture and history in Japan and I'm also interested in relationship with people who live in Tuvalu. What they think, what they do. So, I want to know a lot of circumstances in Tuvalu on my own. We came to Tuvalu to study environment problems. We went to a lot of places, for example, the end of the island, rubbish dump area, church on Sunday, and conservation area, fresh water supplying facility, hospital, TMTI, and visited the families who continue traditional lifestyle. However, I am a freshman at our university. And I don't have enough knowledge about the problems of the environment. So, I thought hard, but I can't come up with suggestions. However, during my stay in Tuvalu I noticed a lot of things while sightseeing. So, I'll talk about it as a tourist. Firstly, when I came to Tuvalu, people gazed us. And I was a little bit afraid of the people. However, as I spoke to people and talked with them, and I found that they are so kind. I think it's very nice point. Secondly, we can't eat traditional foods of Tuvalu. So, you should build more restaurants we can eat your traditional foods easily and be careful about things being sanitized. For example Japan has restaurants that serve a lot of sushi (raw fish). Thirdly, at the conservation area, we can see a lot of beautiful scenery. I think they are very attractive. If you want to bring a lot of tourists, you should advertise your conservation area, using tour guides, posters, and the Internet. Finally, the most important thing, I think, is rubbish. Tourists like to see beautiful seas, skies, and beaches. However, they don't like to see rubbish on the seashore. So to bring a lot of tourists, you should treat waste. If you have a beautiful, no waste seashore, a lot of tourists will enjoy sightseeing and when they go back to their countries and they will say "Tuvalu is great." And I think the relationship between the

local people and government is important. For example, if you want to do a project and you have a good connection with local people, the project might succeed much better. So, I think if the government and local people get together to do a lot of things, probably, the two will get along. Tuvalu is such a good country. Nature is beautiful here. People are so kind. I had a lot of good experiences in Tuvalu. So, I will take my opinion to Japan and I'll study harder about environmental problems and how to develop the country. Thank you for listening.

Aki Koga:

Talofa! Nice to meet you again, thank you all for coming here today. I am Aki Koga, a graduate student specializing in environmental law. I stayed in Tuvalu for about 1 week, but it is not so enough time to do research, I think, however, I saw some places which are illegally dumped areas. I remembered a sad experience which occurred in Japan. In the 1960's public nuisance had come to surface in Japan, quite many people suffered from various and serious diseases and lost their health, as you may know. In 1990, a terrible illegal dumping case in Kagawa prefecture was exposed, after that a lot of laws and conference systems were set more practically. Here in Tuvalu, I heard there are some other environmental problems besides illegal dumping. These are air pollution, noise, rubbish burning (but it is not so often), and climate change. However, there are no measures to research the impact of such problems, and so it is really difficult to solve or improve the situations. I also heard that land conflicts between the residents in Tuvalu are increasing now. By "land conflicts", I mean, because of the land erosion, the land in Tuvalu is getting smaller to live on, and it causes conflicts among the people, so it seems to be a kind of environmental problem. Thus, I found out some environmental problems in Tuvalu. However, I can not indicate detailed documents or reports for analysis now. In the case of the environmental conflicts in Tuvalu remarkably increasing in the future, then, I think Japanese past experience can be applicable. In comparing Tuvalu and Japan to resolve the problems, I have come up with one idea. Please write an annual reports or document about the environmental

problems and publish it all over the world, and also let the people in Tuvalu know. Finally, I would like to say one more thing. Please do not forget that our eco-study tour is the beginning of our cooperation and relationship. This is not the end. It has just started. After I go back to Japan, I will be ready to study more about environmental problems in Tuvalu. Please keep in touch with us in the future. Thank you very much for listening.

Yuko Kikukawa:

I study environmental problems and welfare at Saga University. Now, I am going to make presentation. Firstly, I observed that older people are nicely cared for by younger people. Families usually take care of old people in Tuvalu. In Japan, some families don't, because caring for people by themselves is hard to do. In addition to that, welfare facilities are full, and many older people cannot get in. A long time ago in Japan, families were used to take care of older people, as in Tuvalu. But the nuclear family has increased in Japan, recently. Consequently, younger people in families that take care of old people had decreased. I heard that the nuclear family is increasing also here in Tuvalu due to the westernization of your lifestyle. But, don't be like Japan! I hope that Tuvalu's traditional way of looking at older people will last a long time. Secondly, I observed the air pollution and health care. I heard that life style-related diseases are increasing. I think that people don't know these diseases at all. I suggest giving information about these diseases and their symptoms through radio and poster announcements, and educate the students at school. I urge you to go to hospitals to investigate this matter. I think that people go to hospital because people need not worry to pay bills. If people can prevent disease, the expenses of the government will lighten. And if the number of people who use vehicles decreases, exhaust pollution will decrease, and consequently, air pollution will be improved. Finally, I observed environmental education. I heard that workshops have been done about environmental problems, but I think that workshops are not enough. People don't know how serious the environmental problems that occur here are. So, I suggest extending school hours and teach the students the details.

Besides, I suggest informing the public about environmental issues through radio and posters. You can place books in library, in schools, and in common places. I think that people will start to act to solve environmental problems by getting a lot of information.

Emi Hideshima:

Hello, my name is Emi Hideshima. I belong to the international culture course in Saga University. I'm majoring in Japanese classic literature and Asian culture. So, I'm very interested in Tuvalu's traditional culture. At first, I went to the library to learn about it and I found some interesting things. Firstly, there are few books about Tuvalu's culture. Secondly, almost all of these books are written by American, German, Fijian, and other countries' scientists. Thirdly, there aren't any books about the culture of each island in Tuvalu. These facts were strange for me. Because one of the writers says "I studied Tuvalu's language and culture intensely, but I couldn't understand. It was too difficult for me to understand." I was very surprised by that. He couldn't understand Tuvalu's language and culture, however, he wrote his book as if he knew Tuvalu's culture well. I think Tuvalu's culture in the book may not be true. Each island has its own culture, but these books explain only one island's culture. I worry that people in Tuvalu will lose their own culture in the future and children will be taught a distorted Tuvalu culture. I think traditional culture is very important for people, because traditional culture presents a lot of good ways of living. In Japan, we have tendency to overlook traditional culture. One good example is the "fuloshiki". A "fuloshiki" is a square cloth to carry things. A "fuloshiki" is like an Eco-bag. Instead of using plastic bags, people who use fuloshiki are increasing and this serves as an activity for earth protection. Like this, we should learn a lot of things from traditional culture and we can do it. These are many keys to solve environmental problems in traditional culture, I think. Finally, I'll give my view. The government should gather family books and preserve these to pass Tuvalu's culture on to next generation. Second, I think Tuvalu's culture has to be written by people in Tuvalu to preserve good culture. I think people in Tuvalu have a

lot of wonderful culture, not only Tuvalu but other countries as well. So I want people to notice how important their own cultures are. Thank you for listening.

Kana Hideshima:

I study about the culture and history of Asian countries and the international relationship between Japan and other countries. I think the key to foreign affairs in the 21st century is environmental issues; that is why I came to study in Tuvalu. Also, while in World War II; Japan had a lot of colonial property in the South Pacific Islands, so I'm interested in them, too. I researched the environmental issues in Tuvalu from the view of culture and history; especially how the westernized system influences Tuvalu, because it connects deeply with environmental problems. My first impression of Tuvalu was that it is more industrialized than I imagined and the lifestyle is very westernized, so I was surprised. Because of that I thought people of Tuvalu don't need their traditional cultures any more, so I thought people of Tuvalu have a little consciousness about their own culture and history. But I was wrong. There is a traditional cultural education in Tuvalu from elementary school to secondary School. People live with their family and also the family consists of many generations of people. People have traditional techniques to keep foods long without putting them into refrigerators. Culture and traditional customs have strong power in Tuvalu even now. I read a book called "Tuvalu: A History" in library this morning. It says that many foreigners want to write about Tuvalu's history and culture. It is a good thing, but they are not Tuvaluan. So, I think they can't share their views in a true way. People should record their history by themselves. This book showed me how the people of Tuvalu think about their own culture and history. It's sure that they lost a lot of traditional culture. The westernization of their lifestyle brings rapid change nowadays. It has big impact on their culture. In my opinion, the environmental issue is less important for people, and westernization of lifestyle brings more serious destruction to Tuvaluan culture and the environment. I know that developed systems are needed for people, but we have to protect culture and

environment. We have to do both of them. The way of life for the people in Tuvalu has developed recently and will continue to develop. Their culture has changed since the first settlers arrived. Life in Tuvalu has been shaped by 3 main forces. The influences of these forces are both lasting and obvious. The impact of the so-called Western world which began in the 19th century with the arrival of palagi traders and Samoan pastors is one of the forces, so westernized problems did not happen just now, but long ago. I think it is important to remake the westernized system to meet Tuvalu's lifestyle system and traditional culture. Japan has remade many kinds of imported cultures from thousand years ago, because Japan is also an island country. I think remaking culture is possible in Tuvalu, too. For example, Tuvalu doesn't have enough land to treat waste, then why don't you ask developed countries to take the responsibility to treat the waste when they export items to Tuvalu, like the deposit system. Do you know the deposit system? It is common in Japan. In this system, a company has to have responsibility to treat its own waste. In that case, you can develop and still protect the environment. I think the key to solve environmental issues is to know our ancient knowledge once again and to promote them. It will lead to discovering the way of having sustainable development. I didn't have enough time to research, so I want to study more now. Thank you.

Nami Nakahara:

We have seen many things and talked with many people throughout the seven days in Tuvalu. My biggest impression was the rubbish issue. Before coming, I had thought that the most serious issue was the rising of the sea level because of the effects of global warming. But I found that people have spoiled Tuvalu, not only by the rising of the sea level, but also by rubbish. If Tuvaluans ignore the rubbish problem, the issues on culture and health will become a larger problem, I think. In Tuvalu, I saw beautiful seas, sky and also rubbish piles. It was too much of a mismatch. This wonderful scene must be your pride of Tuvalu. But I saw rubbish and I was very shocked. It's very unfortunate. Tuvaluans should stop increasing waste and clean-up Tuvalu because Tuvalu must be one of the treasured islands on the earth.

It's difficult to do it all at once. People should start from small things or what people can do now. Firstly, everyone should not buy unnecessary things. Secondly, everyone should buy things which produce little waste. Thirdly, everyone must use things as long as possible. These actions were not seen anywhere in Tuvalu. The reason is that it seems that people do not know that kind of idea. So, I think education is very important. It's no use suggesting anything if people in Tuvalu don't have an awareness of the importance of the effort to reduce rubbish. Any facilities built by foreign aid will become useless beneath the low consciousness of people for environmental problems. People don't know that they must not throw away rubbish, or rubbish will harm their own health. They seem to think rubbish is dirty, however, they seem to have little plan to stop throwing it away. There is a large difference between government and civilian. The government has to reverse the situation that foreigner's consciousness about rubbish is higher than that of Tuvaluans. People who live there should know their homeland best. I have three suggestions. Firstly, the education of sustainable development for future: Tuvalu needs to improve teacher's ability to teach environmental education. To do this, the government may call upon someone who is familiar with environmental problems, and discuss how to teach about it. The government should give teachers the opportunity to go abroad to study environmental problems. Secondly, the education of sustainable development at present: There is a need to educate adults, the government needs to open workshops with inhabitants regularly. If everyone talks over the problems, awareness on the environment will increase even more. Then, Tuvalu might find answers. Thirdly, give advantages for people of high consciousness: For example, I think the introduction of a deposit or discount system is effective. The system is one in which the government may make honorable recognition of people who do environmental activity, or proposed a good idea and gave advice. Then people will be encouraged and, as a result, want to try their best. There are some ways to load less of a burden on nature even if there are not facilities like waste treatment centers. So Tuvalu has to think of remedies at the local level and find the ways to fit their own culture. I am

going to continue to find solutions in Japan. For example, I will listen to experts. It's necessary to cooperate with Tuvaluans for their environment. I would like to do my best to improve Tuvalu's environment with you.

Sayaka Shibata:

Hello, my name is Sayaka Shibata. I study green engineering at Saga University. I am happy to come to Tuvalu. I arrived in Tuvalu last week, I visited a lot of places in the Funafuti atoll. I noticed two things from my viewpoint. The first point is that most of facilities in Tuvalu are built by the support of foreign countries. Most of these facilities are necessary for Tuvalu people to live, for example, the supply of water, electric power, and food, etc.

The fuels used in the facilities are also from abroad. Support from foreign countries promotes climate change on the earth and health problems in Tuvalu at the same time. I thought that the facilities' construction should be continued domestically if it is given by the support through the foreign countries. A preliminary poll is mutually necessary for that. And, I think that if it's done, it will support the sustainable development of the home country. The second point is that rapid lifestyle modification occurred in Tuvalu, and the traditional style is rapidly being destroyed. Moreover, many people cannot catch up with the changes. Nature was destroyed, which also occurred in Japan at the time of its period of economic growth. The compensation at that time is hard to see now. We have experienced that nature destroyed once needs a lot of time to recover. I think the information in Japan should be spread out to the world at once, so as for many people to be able to make a change into a good direction quickly. Tuvalu is a low-land country with little natural resources, in addition, the population density is large though its land is very small. As an improvement plan for the above-mentioned problems, I would like to suggest that :

- (1) An appropriate environmental assessment should be taken prior to the development, and the adverse effects should be prevented.
- (2) Garbage should be made into resources by using the environmental tax (such as deposit system).

(3) Practice environmental education more frequently at the community and governmental level.

Finally, talking about Japan, we have been developing the proper procedures to take on developments. As for the recovery of the environment, we came to understand again that the development without destroying nature was necessary because the recovery of nature needs a lot of time and money. We wish to express our gratitude to the people of the government for kind answering to our question. Thank you for listening to the last minute.

Kumiko Shinohara:

My name is Kumiko Shinohara. I study environmental technology at Saga University. We stayed in Fiji and Tuvalu to study, and we visited many places to see the environmental pollution and culture. I was especially interested in water pollution. Tuvalu is a country surrounded by the sea. The sea is very beautiful, so I like it very much. I compared inshore water with offshore water. I found that the inshore water is dirtier than the offshore water. Then I noticed the human waste treatment in Tuvalu. The drainage consists of, for example, domestic wastewater discharging into the sea in Tuvalu. And human waste is saved in a septic tank that most families have. Then septic waste is used to make methane gas. But now methane generator is broken, so now human waste is buried underground. This may cause marine pollution and groundwater pollution. In addition, these problems may affect human health. So I think a human and animal waste treatment system is needed in Tuvalu. There are two different advantages. The first advantage is the power generation of methane. This project has already proceeded in Tuvalu. By producing methane gas, charge of oil will decrease. This will contribute to sustainable development. To expand this system, I think it should become a so-called “deposit system”. For example, people who supply waste to the system, they can get gas for free. Then many people will cooperate and live a kind life for the earth. The second advantage is compost. In Japan, it’s popular to make compost from human waste. It’s called *Ekahi*. Many Japanese like vegetables and fruits

made by *Ekihi*, because those are more delicious than others. I think you need to keep the area for *Ekihi* small as to enable community to work together. When I go back to Japan, I will examine the best way to make *Ekihi*. I think it's important for Tuvaluans and Japanese to cooperate with each other. Thank you very much.

Sayaka Mukai:

Nice to meet you. My name is Sayaka Mukai. I came from Japan to see the effects of global warming. For example, the rising sea level, damage from salt, and inland flooding by high tides. Firstly, before I came to Tuvalu, I thought Tuvalu might have a serious problem that is encroaching on seaside and King tide. I spent one week watching various places. The conservation area, the rubbish dump area and so on. Some Tuvaluans say that the effect on shore has already happened in the past, while others say that it started from climate change in recent years. I cannot know which is true, since I can only see the present conditions. I wonder if it really happened by global warming. It is difficult to know this answer. However, my opinion is changing. I think Tuvalu has a more serious problem. It is a rubbish problem. There are some garbage dumps in Tuvalu. The places are flooded with different types of rubbish: Plastic bags, nappies, in-flight meals, machines, used cars and so on. This is both in government and Funafuti city control dumping areas. If the government made a law to manage rubbish, the city would need to act. I think that their cooperation is most important. If cooperation between them can be practiced, waste treatment activity will be promoted. Rubbish should be separated by types: Flammable, nonflammable, plastic bottle, cans, pet bottles, etc. Diesel and oil can be produced from plastics. It is possible to collect empty cans and export them to foreign countries. This action will activate the economy and decrease rubbish. I feel the government must make a move. Lastly, I realized that I should study environmental problems and deepen my knowledge when I go back Japan. Thank you for listening.

Kiyoshi Yoshimizu:

My name is Kiyoshi Yoshimizu. I'm a public health nurse and also a graduate student at Saga University in Japan. I would like to talk about the issue of the "increase in lifestyle related diseases" and "Health problems caused by waste products" as a theme.

Firstly, the health problems related to a negative lifestyle habit. Dr Stephon Homasi said that four lifestyle diseases have been increasing these days in Tuvalu. These are heart disorders, diabetes mellitus, hypertension and failed hearts. It is also same situation in Japan. These health problems are brought on by negative lifestyle habits. Eating habits and fitness habit are big influential factors. To prevent these health problems, it is very important to have a regular health check-up and health education. This might be able to be achieved by making requests to NGOs or other organisations. In Japan, Public health nurses promote these supporting activities. I think it is very effective and important for you to have weight measurements, blood pressure measurements and body fat percentage measurements. You can understand your health conditions through having these measurements. Continuation of these activities is very important to keep your good health. I suggest that you make a health card and deliver it to people. Then you should propose recording the health measurements. I'm sure that it will work.

Secondly, the Health problems caused by waste products:

I saw a roosters picking at garbage in the waste landfill place. I thought it is very serious and dangerous, because of the bio-concentration of poisonous chemicals. So, I considered the ways to solve this problem.

1. Review the "rules of garbage collection, including the way refuse is separated".
2. Make standard rules for breeding domestic animals
3. Make standard rules for entering garbage landfill
4. Give punishment to violators
5. Set up an incineration facility

It costs a lot of money, but I'm sure that it will bring considerable improvement.

IV Outcomes and Future Plans

The Japanese students were given a priceless time to experience, learn, and acquire knowledge on many environmental problems in the South Pacific region, by visiting Fiji and Tuvalu. These two countries are suffering from many, rapidly and simultaneously proceeding environmental problems.

In Fiji and Tuvalu we observed many of the environmental problems the people there are facing such as falling and leaning trees on the seashore, disappearing islets, bared bedrock between islands after the sand was washed away by waves over the narrow lands, repaired embankments after being washed-out, and sea-water bubbling out from the ground during high tide. In Japan we had heard about these phenomena caused by global warming but it was very alarming to see them first hand.

We were able to observe what happens in countries that do not have a system to treat or recycle rubbish. We found waste materials discarded in ponds and creeks where the waste was piled up without being separated. It consisted of flammable and non-flammable materials, plastic, cans, metal, and house garbage. We were shocked by the contrast of the beautiful scenery and these piles of unseparated rubbish.

We were also lucky to learn from the people other problems that are occurring there such as the loss of fresh under ground water as it is being replaced by sea water and the increased use of rain water kept in storage tanks. We also heard how the fast growth in adoption of a western lifestyle has caused the disappearance of their traditional life, increased health and sanitation problems due to the burning of rubbish or water contamination from toxins oozing from waste materials that include harmful chemicals. We were also told about how there is a great loss of educational opportunities on these environmental issues as the government does not have the finances necessary to fund schools properly.

In Japan the students had heard that Tuvalu is a country which is slowly sinking into the sea due to global warming. They learned in Tuvalu that this serious problem is not only the result of sea level rise and land erosion but

also discarded and unseparated wastes. The problem can only be solved by increasing the educational opportunities both in schools and society because the people themselves are not fully aware of environmental problems they are now facing and suffering from. A significant improvement in the quality and a wide offering of educational opportunities to both children and adults is of primary importance to these two countries and, indeed, likely to all the countries in this region.

After the students returned to Japan they created their own group to improve their lives and to reduce the environmental damage in Japan. The detail of their activity plan is shown in latter part (II) of this chapter. They applied for the fund on environmental measures and it was granted.

In March 2008, Saga University was certified to be the first university in Japan to promote Eco-Action 21 activity, which is offered by Japan's Ministry of Environment. Eco-Action 21 requires environment control measures, such as the reduction of carbon dioxide discharges, wastes discharge (including separation), or water discharge, and so on. Prof. T. Okajima is one of the directors of Eco Action 21 program.

Additionally, the students participated in Saga University's *Saga Environmental Forum*, in which teachers, students, and civilians living in Saga prefecture participate to discuss, study, and learn about environmental problems and measures from different point of views (economically, socially, or regionally). Prof. T. Okajima is also one of the directors of this Forum.

The students' communicating and negotiating abilities with officers of local government or regional residents in Saga are expected to be improved by performing these activities.

We are planning to establish cooperative-project with USP, Fiji and Tuvalu government. Analyzing our suggestions and their feedback at the wrap-up sessions, we need to further discuss with FIO of USP, Fiji, and Tuvalu government for the practical cooperative-project that our team can work with. The projects can be, for example, making tools for promoting

environmental education to help people tackle the waste problems and other environmental problems, joining with FIO project team and assist the Fijian villages facing environmental difficulties.

I During the Eco Tour

(A) Students acquired basic knowledge and learned about the environmental problems occurring in Fiji and Tuvalu. They also learned about the complex relationships between environmental issues and the cultural, social and economic problems that countries face. In Fiji, they heard lectures provided by Dr. E. Weber, Dr. R. Thaman, Mr. Fine Lao and Mr. Leone Limalevu on Fiji's situation and the students also heard from many of the villagers they visited.

In Tuvalu, they were able to interview some specialists of environmental related sections (the officers, chiefs, heads, or the persons in charge, etc, of each field) and thereby gain a unique understanding of the problems.

(B) Students learned and built up a foundation to continue their activities in some fields such as environmental technology, education, law, medicine, sanitation, etc.

(C) Students had exchange opportunities with Tuvalu's USP and TMTI students. After returning to Japan they sent thank you letters to some USP staff members and Tuvalu governmental officers, as well as personal letters to their newly made friends. Saga University students will maintain this contact with the people they met in Fiji and Tuvalu.

II After returning to Japan:

(A) All ten students who participated in this programme established an acting group called "Ragoon."

Its homepage is <http://ragoon.ikidane.com/>.

(They named their group "Ragoon", not "Lagoon")

(B) The "Ragoon" group applied for a grant-in-aid (called "Eco-Saga Fund") from the Saga Newspaper Company as a sponsor of the students, and they successfully obtained some funding (10 million yen) for their

environment-friendly actions in Japan in 2008.

- (C) The activities of Ragoon in 2008 are planned as follows:
- (1) producing a report about this eco-tour in Japanese
 - (2) holding presentations at Saga University
 - (3) holding exhibitions of photographs
 - (4) participating in field work (studying the problems of the local area, farming and studying the waste treatment facilities)
 - (5) presenting in other educational institutions, such as schools
 - (6) doing other activities
- (D) Several students, participated in “Eco-Action 21”. Eco-action 21 makes the following demands on students:
- (1) becoming aware of the environmental problems.
 - (2) setting numerical targets for the reduction of CO₂ discharges, the amount of fresh water usage, and waste discharge.
 - (3) taking actions to achieve numerical targets shown in (2).

V Students' Impressions in this tour

Nanae Oshima:

Where do I go from here?

I wanted to know for myself the reality regarding climate change in Tuvalu and Fiji. This is the reason I participated in this programme. While staying in Tuvalu and Fiji, I talked with a lot of different people, people from the government, professors of USP, and local people.

I was most impressed by how the people are attempting to lead their lives while trying to maintain development, keeping their traditions alive, and dealing with their environmental problems at the same time. From the government, I received the impression that government thinks that the development of the country is more important than the solving of their environmental problems. Moreover, I found that the government and the local people recognize the problems differently and maybe it is a cause of misunderstanding.

As a result, I think education is very important to solve a lot of the problems. It is important to answer difficult math questions and to study the social systems of the world. However, I think the most important thing is that the people there should know about their country. Additionally, they should examine what they can do and carry on with education to support better development. For this reason it is necessary that local people fully understand what is happening in their own country and the world in relationship to climate change. They themselves must take the appropriate actions to solve the environmental problems in their country. It is the same not only in Tuvalu and Fiji but also in Japan and other developed countries.

At USP, one professor said, the quantity of carbon dioxide which Tuvalu and Fiji have emitted is quite small. However, great changes in the countries' environments have occurred due to climate change.

This fact was deeply etched in my mind as a serious problem. I think the environmental problems are not only soil erosion, rising sea levels, and rubbish, but also the drastic changes in the surroundings in which the people live. Now, in developing countries like Tuvalu and Fiji, additional

problems, such as increased pollution due to development have occurred along with climate change. These problems can not be treated individually and it is necessary to note the relationship between those problems. After that, we must consider a new solution.

From this point of view, I think it is important that developing countries and developed countries keep working together in developing viable plans or solutions to assist countries. Developed countries also have to provide financial support to the less developed countries to make this successful. I also think it is necessary to inform the local people about the problems and to develop a process where they can solve many of these problems themselves.

I have gained a lot of experience in Tuvalu and Fiji and I got a lot of new information and knowledge for the future. I know I have much time in my life and I want to study about this problem, not only at my desk but also on site.

Aki Koga:

Since I entered the doctoral course of Saga University and started to do research in environmental law, I always looked for opportunities to go and see some actual environmental problems that are now occurring throughout the world. I would consider a resolution or remedy that is most needed and suitable for the situation. I do not want to be a top-heavy researcher who always mentions impracticable theories, but rather I strive to be a respectable researcher in the near future. For this reason I was very happy to be a member of this eco-tour.

My life in Japan is as simple as I can make possible. For example, when I go shopping, I always take my own shopping bag instead of using plastic bags at shops. When I go to a restaurant, I also take my own chopsticks instead of using the disposable wooden chopsticks provided by the restaurants. When I take a bath or wash clothes and dishes, I use synthetic soap and detergent. I do not buy disposable products because I would like to decrease the burden on the environment. However, it is impossible for us to have a completely environmentally harmless life on the earth. Therefore it

was necessary that I see life in endangered countries and consider the problems they suffer.

In Fiji, we visited two villages which keep to the traditional way of life and customs. Their life seems to be much more modest than that of Japan, but many of the people there have their own cellular phone and other products used in a typically westernized lifestyle. This lifestyle and their products have a tendency to overtake and ultimately destroy the traditional culture. The impact of climate change also affects their life gradually. As a result, their way of life is changing now. Westernization has meant that the people are now living in a monetary culture instead of a material one. They have to earn money to live. They suffer from the land erosion, flooding and sick fisheries caused by climate change. However, they get almost no compensation from the government for this damage. I had a deep impression when they said that their poor government always puts them into trouble. I felt that they could say this because I am a foreigner. However, if I were a Fijian or someone familiar to them, they could not say this. I recognized their social system then, and realized that our role was to try and understand their problems and then point out matters while being outside of their community.

In Tuvalu, we visited some families which kept a traditional lifestyle. However, it was not an authentic traditional lifestyle as we had imagined. I found life in Tuvalu was much more westernized than that of Fiji. Tuvalu is particularly more advanced in terms of their economy.

In Tuvalu, we visited many places. I also noticed that there was a lot of rubbish everywhere. I certainly agree that Tuvalu has a beautiful blue sky and sea; however, the scenery is ruined by such rubbish. It was strange and disappointing to make such a discovery. Further, many people in Tuvalu did not recognize rubbish problem as an environmental problem, so paid no heed to tossing away trash on the road, and elsewhere. This happens not only in Tuvalu, but also in Fiji. The waste treatment system does not work well in both countries. When I stayed in Tuvalu, I discovered it has many environmental problems such as illegal dumping, air pollution, noise, burning nonflammable rubbish, climate change, and land erosion. Among

these problems, the most serious and urgent seemed to be waste treatment. I thought that better environmental education for the residents of Tuvalu is of great importance. Through exchange with residents, it became apparent that they were unaware of risks associated with noxious waste. They regarded waste to be as harmless as flowers and trees. Ignorance sometimes causes a big problem, which is why I emphasize the importance of education.

Based on my observations, I suggest a plan to create an environmental textbook or to make posters which advertise the threat of pollution to the people of Tuvalu. Through these initiatives, people will eventually instigate change. Fortunately, serious illnesses caused by pollution that had previously occurred in Japan have not yet happened in Tuvalu. However, it cannot be prophesied that such illnesses will not come about in the future. I think Tuvalu's people must ascertain the problems from which their country suffers. Moreover, they must, in the end, resolve these problems by themselves.

Japan used to be notorious for public nuisance and diseases caused by pollution. Thus, the unfortunate experiences of Japan's past can provide a lesson for Fiji and Tuvalu, so they do not fall into the same trap. Of course, all of our eco-tour members can provide aid in the form of ideas and action to the local people. I, too, am ready to cooperate with them at any time.

During my stay in Fiji and Tuvalu, I could not confirm results in my specialty area of environmental conflict. In this regard, I have regrets. I would like to study more in future, and if I have a chance to do research in Tuvalu again, I am willing to go and study.

Lastly, I would like to thank all concerned: all the staff in ACCU, UNESCO and USP, all the officers in the Fiji and Tuvalu governments (including our wonderful guide, Ms. Sylia in Tuvalu), all people in Fiji and Tuvalu, and I also wish to thank all the members of this eco-tour and Mr. and Mrs. Okajima.

Yuko Kikukawa:

I learned about the cultural, educational, and environmental problems in

“Practical Eco-Tourism for the Education of Sustainable Development.”

Firstly, I visited two villages in Fiji. I drank kava in the "sebusebu" ceremony when entering each village. It was my first experience to taste the drink. I had never drunk it before. I was glad to experience their hearty receptions. There were similarities in the two villages. Plants play a very important role. For example, the coconut trees are used for drinks and for food. People can make carpets and baskets by using dried coconut leaves. People use medicinal herbs for diseases because there is no pharmacy. I was surprised at these customs because there are no customs like that in present day Japan. Thus, people living in the villages demonstrated self-reliance. So, I felt that Japanese people should follow their example.

In the first village I went to, I found severe soil erosion along the river side. People have been trying to prevent the erosion by planting trees and making river banks. In the second village I went to, people said that the amount of fish they can catch has decreased due to the drainage from Suva. I was sad because people in the villages have suffered from losses that the developed countries, parts, or the cities have brought about.

In Tuvalu, I visited many places, such as the Department of Education, the Department of Environment, a power generating station, a hospital, and TMTI. I learned about techniques for educating people about environmental problems from the Department of Education. I learned that workshops about environmental problems are held in schools and educational programmes have been performed for adults by an NGO. I thought that the education concerning environmental problems is not enough. I felt that people's consciousness about the environment is low in Tuvalu. I think that a higher educational level is important to change their consciousness. I also learned that Tuvalu is being westernized gradually. Therefore, nuclear families are on the increase, and people don't know what they should do because change is happening so rapidly. I felt that people in Tuvalu want to protect their culture.

I learned about the conservation area from the Department of Environment. Tuvalu plans to establish an eco-tourism programme in the conservation area. They will use the income to protect the conservation

area. There is no worry about trampling the conservation area because visitors must be accompanied by an expert guide. I suggest that Tuvalu should advertise this eco-tourism programme worldwide. If increased tourism brings additional income, Tuvalu can channel the monies into education to deal with environmental problems.

I saw inland flooding phenomenon at the time of high tide for the first time in the final day of our stay. I have known about inland flooding from books, but the scale of it exceeded my imagination. The water welled up under the ground, and the water tasted salty. The water increased as the time went on. I felt terrible when I thought about this inland flooding by high tide that might occur over the entire island in the future.

I felt that the rubbish problem is the most serious problem in Tuvalu now. There is a garbage dump at which people illegally dump. People who live near the garbage dump get very itchy when they clear away the garbage. Further, at the official garbage dump area, rubbish is not treated properly. If the rubbish floats out to the sea due to high tide or a storm, the sea will become polluted. The rubbish problem seems to be solved only within Tuvalu because Tuvalu is such a small country. I think international involvement to solve the rubbish problem is necessary.

I felt that education, culture, and medicine are linked to environmental problems. We should consider environmental problems in relationship to other problems, such as education, and culture to find the solution. I felt that individuals should act, and not leave everything up to the government. Correspondingly, I will try to do whatever I can.

Emi Hideshima:

My most insightful experience during the tour was to visit the villages in Fiji.

People in the villages follow a traditional way of living even now. They showed us their traditional ways. They raise crops and animals for food. They also get coconuts, bananas, pineapples, papayas, and sugar cane from their fields. They use the coconut and its leftovers from meals as bait. The domestic animals' excrement is used as manure. I found their crops grow

well. They even make medicine on their own from plants in the villages. They can make whatever they need by using natural resources. Although they don't have much money, I thought they live with enriched minds. Their self-reliant lifestyles are environmentally-friendly as they don't create rubbish. I was impressed by their lifestyle and became more interested in their traditional culture during our stay.

In Tuvalu, I went to the library to learn about Tuvalu's traditional way of living. I could find only a few books written about Tuvalu's traditional culture. These books were written by American or German researchers. One of the writers said "I found studying Tuvalu's language and culture very hard. However, I couldn't understand the writings on Tuvalu's culture. It was too difficult for me to understand." I was very shocked to read that. He didn't understand Tuvalu's culture but he wrote his book as though he knew Tuvalu's culture well. I think Tuvalu's culture in this book may not be true and this book may create misunderstanding.

I think traditional culture is very important for us because traditional culture is the crystal of the wisdom of ancient people who had a lot of ideas so that people could coexist with nature. Tuvalu's children should be taught Tuvalu's traditional culture by Tuvaluans. Tuvalu's culture should be written by the people who were born and grew up there (native Tuvaluans). We should learn a lot of things from traditional culture.

I think Fiji and Tuvalu have wonderful cultures. The traditional way of living is the key to solve environmental destruction. I want Tuvalu's people to notice how important their own culture is and to keep ancient wisdom.

I want to see Japanese tradition in a new light. I would also like to adopt good traditional ways of living in Japan. I would like to take the Fijian example as a good blueprint for my own life.

Kana Hideshima:

I study the culture and history of Asian countries and international relationships between Japan and other countries in university. I think the key to foreign affairs in the 21st century is environmental issues; it is why I participated in this programme. At first I thought there was no connection

with my majors of history and culture. I thought environmental problems were only isolated issues, and I would have little opportunity in which I could get some ideas to solve environmental problems due to lack of knowledge.

When I got to Fiji, I studied environmental issues and listened to some lectures at USP, but I could not feel that the problems were real. But then one day I was able to get a big hint. It is the westernized system that effects not only the destruction of history and culture of the Pacific Islands, but also our surrounding nature and environment. Therefore, I decided to research environmental issues in Tuvalu from the view of culture and history, especially the effect of westernization, because I think it must be strongly connected to present day environmental problems.

I realized the relationship between these problems in two villages I visited in Fiji. People have much practical knowledge in these villages. They drink the juice and eat the inside part of coconut shells, and then use them as cups. Instead of being wasteful, the shells are used as vessels. This is only one illustration. They have a lot of ways of living without producing waste. I think this is the key point to achieve sustainable development.

It reminded me that many items were also recycled between nature and society in the past days before industrialization in Japan. I believe almost all materials had been recycled in Fiji and Tuvalu, when they lead their traditional way of living. But now, a self-sufficient lifestyle does not seem to penetrate adequately through to the people of Fiji and Tuvalu. Traditional culture and a westernized system cannot coexist well in Fiji and Tuvalu today. The westernized system has been destroying the traditional culture of Fiji and Tuvalu. Consequently, environmental problems have occurred. Because their lifestyle has changed rapidly, traditional culture has not caught up with the westernized system. As a result, a natural recycling system doesn't work well, and a huge amount of rubbish is generated.

What I was most shocked about in Tuvalu was that people throw away rubbish everywhere; and I was also shocked that people don't separate waste according to type, even in the collection area. There were all kinds of rubbish, flammable, non-flammable, plastic, CDs, metal, other garbage, etc.

I could not believe what I witnessed. Indiscriminant disposal of waste is clearly very bad for the environment and, likewise, has a bad influence on human health. I noticed one other thing. People didn't need to separate waste. It could easily be thrown away as it was all decomposed and returned to nature anyway.

At present, traditional culture and western culture do not coexist well in Fiji and Tuvalu. However, we need both. Developed systems are convenient for people, including myself. We must achieve an environmental-friendly culture or life-style that goes hand in hand with development.

I think it is important to think of how to rebuild the lifestyle of the Pacific Islands by adjusting traditional culture with western culture. It has been said that Japan has assimilated many outside cultures and shaped them into a uniquely Japanese culture over thousands of years. The experience of Japan is applicable to the development of other island countries, as well.

Now I have two ideas.

Firstly, the Pacific Islands don't have enough land and money to manage waste. They had better ask developed countries to take responsibility for treating waste which is exported to the Pacific Islands. In a deposit system, companies who make materials have to take responsibility for treating waste produced by those materials. I think this system has a good effect because the Pacific Island countries will be able to develop and protect the environment at the same time.

Secondly, they should promote environmental education in schools. I think changing consciousness of people on environmental issues is required to protect their culture and nature. For example, they do not know why they should separate waste by type. That's why they throw away waste anywhere and mix all sort of waste together. Developed countries have to help them, of course, but developing countries also have to do something to help themselves. They must educate their people about how to deal with their waste. They need a higher level of individual consciousness to solve environmental issues.

A traditional way of life contains a lot of knowledge about how to live with nature. I think the key to solving environmental issues is to remember our

ancestor's knowledge once again and to hold on to it because it goes along with surrounding nature. It will lead to a discovery of a way to achieve sustainable development.

I couldn't do enough research because I did not have enough time, but I'm very glad to gain a new way of thinking about environmental issues. Everything is related to environmental problems. I want to continue my study from my new views.

Nami Nakahara:

We saw many things and talked with many people throughout the seventeen days of our stay. My biggest impression was the rubbish issue. Before coming from Japan, I had thought the serious issue was the rise of the sea level caused by the effect of global warming. Yet, I also found there that people spoil the islands, namely by throwing rubbish all around them, which is a bigger problem than the rising sea level. If people continue this rubbish behavior, cultural and health problems will also become more serious. In Tuvalu and Fiji, we can see beautiful seas, beautiful skies, and rubbish piles. The mismatch was disappointing. These wonderful scenes must be the people's pride in Tuvalu and Fiji. Yet when I saw rubbish at the same time, I was very shocked. It is regretful. People should find measures to deal with the problem and also should clean the islands. It is easy to start, though difficult to achieve. People should start with action that they can do. The people's environmental activities could not be seen. Maybe no one has knowledge about what the problem is. I was surprised to see a man was throwing away food wrappings on the ground. I saw many other people do the same thing. I rarely heard from them about their knowledge of environmental problems. They probably didn't know that they should not throw away rubbish, and that the rubbish will affect and harm their health. How can they solve this issue without a basic knowledge of the environment? Thus, education is very important.

It's no use suggesting a solution if the nation doesn't have an awareness of reducing rubbish. It is the same when garbage-treatment facilities are built by foreign aid when people do not know about environmental problems.

They seem to think that rubbish is dirty but they cannot do enough to treat, and that nothing will change.

I found there is a huge difference of consciousness between the government and the civilians. Talking about Tuvalu, the government has to change the situation in which a foreigner's consciousness of rubbish problems is higher than that of Tuvalu's people. Citizens should know about their homeland more than foreigners do.

Here are three suggestions:

Firstly, create education about sustainable development for the future. Tuvalu and Fiji need to raise their teachers' skill levels. The government should choose teachers who are familiar with environmental problems, give them information about how to teach about environmental problems and send them abroad to study.

Secondly, create education about sustainable development for the present. To educate adults, the government needs to hold workshops for residents regularly. If everyone talks together, the awareness of people will rise. Then, the nation will find an answer.

Thirdly, create motivational things such as awards. For example, I think an introduction of a deposit or discount system is effective by making people's recognition level of the environment higher. These kinds of systems could make people's consciousness lead to epoch-making actions in real life. If people who act responsibly are rewarded, they will want to try their best. There are many ways, such as making posters or signboards to learn to separate rubbish by type, gathering rubbish along the road together, etc. in order to make less burden on nature. The construction of waste treatment centers would also be good.

I am going to continue to find things I can do in Japan. For example, I will listen to experts. For environmental conservation, it is necessary to cooperate with Tuvaluan and Fijians. Through my experiences on this tour I could also find negative points that Japan can improve. Here, there are a lot of methods I can suggest for Japan. For example, Japan can learn from Fiji and Tuvalu in education on environment, people's relationships in regions, production and consumption in a same area, and the medical system.

I hope that a reciprocal relationship continues between Fiji, Tuvalu and Japan for a long time.

Sayaka Shibata:

I was interested in the customs in Fiji's villages in which there was a consciousness of "what's mine is yours" and "what's yours is mine." This consciousness of common property was a trait seen in the villages. Sharing things was very important and excessive private possession was not practiced.

Moreover, villages in Fiji reminded me Japan's mountain villages, though there were some differences. Both Japan's and Fiji's villagers think deeply about their coexistence with nature and they know the importance of protecting natural resources and to live in a traditional way. A monetary economy has made a self-sufficient traditional life difficult. Governmental policy is very important. Both damage and benefits brought by climate change can be seen at the same time. I felt the vagueness of the word "environment," namely, whether the word "environment" in "environmental problems" means "natural environment" or not. I also sensed the difference of people's sense of values from their positions in the environment.

Concerning Tuvalu, I felt that Tuvalu's people did not have a sense of impending crisis, even though it is said that Tuvalu will sink in the sea because of the erosion of the country's land caused by climate change. I also learned about the serious rubbish problem in Tuvalu. And I felt that mass-media only features a certain part of environmental problem in Tuvalu. This distortion of information causes conscious differences between how Tuvalu's people and people in other countries recognize the influences of climate change.

I saw a lot of facilities supported by foreign countries, which I found some of those cannot be operated without foreign assistance. Support from foreign countries, such as that from ODA from Japan, has been increasing. However, Japan, a similar island country, is also suffering losses due to climate change. The construction of facilities should be the ones that local people could operate. It is most important that development in Tuvalu or

other developing countries should be based and created sustainably by themselves. I think one of the proper policies is “production and consumption in the same area.”

During this eco-tour programme, I found both the difficulty and the complexity of achieving sustainable development. There are a lot of common problems in other countries and I want to do my best to use the knowledge I gained in this tour in the future. It was necessary to improve many problems at the same time, such as education, economics, health, etc. in order to approach environmental problems. I believe developing countries have great advantages, because they do not have to make the same mistakes the developed countries have. They can avoid the failures. The usage of advanced technology is one of important measures to avoid the same mistakes. Developing countries should accept the technological assistance from developed nations to prevent the same failures. I began to understand that a lot of money and energy are required to solve environmental problems and that people’s consciousness and thought can strongly influence environmental problems. In other words, people’s consciousness, thought, or fixed belief could also make problems complex. To take precautions against environmental disruption is the most important step toward sustainable development. I wonder if we can find ways to solve the problems that have occurred in Tuvalu or Fiji. However, I can think of many actions we can do in Japan. I became aware of much waste in our lives in Japan. I believe that “production and consumption in the same area” and “sharing” are the most effective measures to achieve sustainable development at the community level.

I experienced many enjoyable, stimulating, and surprising experiences about lives on this tour. People in Fiji and Tuvalu were very kind to us. I was very happy to meet these people. Telling our experiences to people in Japan is the next action. Climate change causes excessive stress to all the living things on the earth and we must solve it as soon as possible. Otherwise, people will take a “who-gives-a-damn” attitude, which is very dangerous for the future of the world.

Kumiko Shinohara:

I was very happy to participate in this programme. I could see and learn many things about environmental pollution and different cultures. Our thematic purpose was to think about what we should do to achieve sustainable development.

We stayed in Fiji and Tuvalu, and visited many places. I found that Tuvalu has many kinds of environmental problems, such as the rising sea level, water pollution, water shortages, waste problems, and pressure due to population increases. However, many developing countries do not have the technology and funding in order to solve these problems. If the problems are left as they are, the circumstances will get worse. It is very important that advanced countries offer technology to improve these circumstances. Advanced countries have a lot of technology. However, they should not force their technology on developing countries but consider if the technology is adaptable in the developing countries. Many facilities have been built in developing countries under foreign aid. However, if those facilities do not work well, they mean nothing. Those facilities should be built and maintained by people of the developing countries they are located in. Developed countries must explain how to operate them and keep offering guidance on operating the facilities. I realized this after hearing people's talk in Fiji's villages.

I also thought about the proposition to solve environmental problems in Tuvalu. I was especially interested in water pollution. Tuvalu is a country surrounded by the sea. Tuvalu's seas are very beautiful, but I noticed that the inshore water is dirtier than the offshore water, which made me notice the lack of sewage treatment.

I would like to propose two suggestions:

The first point is the introduction of power generation by methane gas. I found this project has already been proceeded in Tuvalu. By using methane gas, the cost of oil as fuel will decrease. I think this system would contribute to sustainable development. This system will be expanded to a deposit system. People who supply waste can get methane gas for free. Many people will cooperate and live an environmentally-friendly life.

The second point is the use of compost. In Japan it is popular to make compost from human waste. It's called *ekihi*. Vegetables and fruits grown by using *ekihi* are delicious. Most Japanese people like them very much. In order to actualize this system in Tuvalu, a small facility in each community is enough so as to be operated by the community itself.

We should do something. However, we should not force our own thoughts, ideas, or plans on those people. Instead, we should propose and discuss with them which activities can have fruitful results for each problem. First, we should think about what is most necessary for the country. Tuvalu has received funds to solve environmental problems. They received funding and technology from foreign countries. Environmental problems can be solved in cooperation with the international community.

We are going to study harder from now on. This tour should be the starting point of our activity. I must think of what I can do and how I can cooperate with people in developing countries.

Sayaka Mukai:

Before I went to Fiji and Tuvalu, I heard Tuvalu had problems such as inland flooding from high tides, seashore erosion by tides, and sinking land because of global warming. I found that these were not the only problems. Various other problems in the areas of education, law, or westernization of lifestyle were also there. I recognized these problems as being unsolved and it seemed to be a heap of problems to my eyes. I also started to think seriously about global warming as my own problem.

I often saw the mark of the Japanese flag. It was a sign that Japan has built some buildings and provided many vehicles. I listened to the staff from ODA (Official Development Assistance) during this tour. I thought some of the facilities and equipment were needed in Tuvalu. However, others are not needed and go unused. Japan and other countries should consider what is truly needed there. Also, Japan should consider assistance not only from the point of economics, but also from practical and sustainable points of view.

I had something on my chest in both countries. It is the problem of

rubbish. Rubbish is buried and not separated by type (flammable, non-flammable, plastic, etc). Tuvalu does not have proper techniques to treat waste. That's why waste dumping areas are a mess. Moreover, there is illegal disposal of waste. This rubbish clearly causes pollution of water, and an outflow of rubbish causes health problems for people nearby. I thought Tuvalu could solve domestic problems like rubbish more easily than more difficult problems like seashore erosion caused by a rising sea level. Japan should support the solution of the rubbish problem more strongly because it is closer to local people.

I listened to various opinions from various people who suffer from many environmental problems. I thought it was very important to listen to different views on environment problems from various angles, and I found various phenomena caused by global warming. My perspective became broader. We must not forget our convenient life is based on the sacrifice of many people in the world, and there are surely people who suffer from many environmental problems. There are many environmental problems in Tuvalu; however, one problem is fatal: That country might disappear in the near future because of the erosion of land, and the people of Tuvalu will be forced to move to other countries. Each of us should act to decrease the emission of carbon dioxide.

I swear here that I will change my lifestyle and act to solve environmental problems.

Kiyoshi Yoshimizu:

I am a graduate student at Saga University and a public health nurse.

First of all, I'd like to thank all the people who helped and supported us and our programme. The theme of this tour was "practical eco-tourism for the education of sustainable development (ESD)."

I'd like to share about what I felt and what I thought on this tour. I thought traditions and cultures in the past times were very lovely everywhere in the world. This tour was a very valuable opportunity for me from an international viewpoint. People live in nature, and humans must live by destroying some of nature, yet people and nature must coexist on the

earth. A battle always occurs between mother earth and father sea, and humans participate in it.

I felt the most valuable activity was cultural exchange. I found many old traditions and cultures in each regional group. The people there live in nature and together with nature. On the other hand, they have chosen a western life-style; they wanted westernization (convenience) in their culture. Westernized society is convenient and comfortable for living, but they inherited their traditional lifestyle, too. It was a coexistent lifestyle with nature. This tour gave me great opportunity and made me think about our modernized lifestyle.

One of my objectives in this tour was to think about the global environment in each country. I observed health problems related to the environment in the Pacific region because my major is international health. I found the present activity on health problems was not enough in developing countries. I felt that rubbish problem was also a big problem nowadays. I would have to say that people there live in and with garbage. They have to tackle the uncontrolled increase of garbage. I saw livestock such as chickens and hogs enter a rubbish-dumping area. People live with livestock. I thought we have to think about the effects on the people's health from the livestock.

I also found many plants, fruits and medical herbs in the islands. They use natural resources instead of artificial resources found in modern medicine. This was a valuable opportunity to think about modern medicine, which is usual in countries adapting a western lifestyle. I worried that preventive activity in the medical field could not be found. I thought that education and learning about health was important. This tour became a great opportunity to learn about the condition of health and sanitation problems in developing countries.

I think the environment is a function of all animals in this earth (ecosystem). We humans are all trying to solve problems. To adapt to the environment properly, we need to observe and learn about earth's present environment as much as we can. By taking earth-friendly action after learning about earth, we can find earth-friendly ways and can continue to

live on the earth.

Now, global warming may be out of our control. We have continued to live convenient life-styles. We have unnecessarily used many resources, polluting nature. We have been living comfortable lives on the excessive use of resources. To stop global warming, humans must restrict their own life-styles. Climate change is a complex problem and I think there will not be only one solution. Efforts from all sectors are required to approach this crisis. Environmental problems will cause serious damage to underprivileged people most. Global warming will have devastating implications, especially for the poor. It will be too late if disaster happens.

I would like to appeal to everyone to reduce, reuse and recycle (3R activities). I would like to tell many people in the university and other communities about what I saw on this tour. I hope this kind of educational activity is continued. People must concentrate individual powers together, which will grow to one bigger power. I hope to make a world of coexistence between humans and nature after struggling with present environmental problems.

VI Comments and Suggestions

VI-1. Comments to ACCU

We would like to express our sincere thanks to ACCU for funding for the programme which provided us meaningful experiences. We believe the funding from ACCU was effectively and fully used to achieve our purpose to construct an international relationship between Saga University and the National Commission for UNESCO in two countries, USP in Fiji and Tuvalu, and the Tuvalu government. We would like to expand this relationship to other countries in the South Pacific and develop a widely cooperating relationship.

This programme gave us a real opportunity to understand the importance of mutual understanding for international cooperation in such areas as attaining sustainable development.

VI-2. Comments to UNESCO

The construction of a human network is necessary for the UNESCO charter, and the friendship we have obtained is one of the outcomes of this programme.

The programme gave us a good opportunity to learn the real situation in the South Pacific region. We are keeping in contact with the National Commissions for UNESO in both countries, USP, and the Tuvalu government. The students established the group named “Ragoon” after they came back to Japan. They are going to act as a team to promote ESD. They also keep in contact by postal and electronic mails with new friends in the two countries.

We are willing to contribute to making a human network in order to construct a mutually supportive world for achieving sustainable development. Now, we have obtained a foothold, namely between Japan and those two countries.

We have been encouraged by UNESCO’s promotion of ESD, and we would like to continue our efforts to achieve its goals through our activities and from what we have gained from this programme.

VI-3. Evaluation of the Tour (by Saga University)

“Went, Saw, Thought and Changed”

I was one of the interviewers for the applicants who applied for the Fiji-Tuvalu Eco-Tour. I met them in November, 2007 for the first time. I patiently listened to why they wanted to participate in the tour, taking nearly one day to complete the interviews.

Almost all of the participants' answers were similar to “I think environmental problems including global warming are very important for the future of mankind. But there is no imminent threat around me.” There were a few who did not even have their own passports yet.

What I had interest in during the interviews was how those who are about the same age as my own son would express their thoughts with their own words. The words they uttered implied hesitation, and were not smooth. I had a worry whether they could communicate well in Fiji and Tuvalu. Then they departed in March.

I met them again at the Saga University president's office in April for the second time. I can not forget the impression I had then. I found adults who seemed different from the ones in November. They had changed into wonderful men and women who could express their thoughts without hesitation. I needed to know what changed them.

They held a report meeting in June. They expressed their thoughts with their own adequate words. There was a display of the written notes they made during the tour, many pictures, the coins of the two countries, and so on. They proudly presented in front of the audience what they saw and what they thought about the people who live surrounded by a heaps of waste, the women's status in the predominantly male society, the real situation of the sea level rise and its solution, and so on.

Now, the students say that every day is trial and error. They, however, are trying to continue to get information from Fiji and Tuvalu. They are willing to establish a co-operative project with Fiji and Tuvalu, carry out public relations on their tours in Saga Prefecture, and moreover, rediscover the

goodness of Japan.

I wonder how each of them feels now looking at themselves.

Can people change this much by going, seeing and feeling? I respect those who are trying to find new assignments, breaking their routines. I was assured that the door to the future is not closed for Japanese society which can obtain such opportunities and for the young people who live there.

Isao Mitsutake
Manager of International Affairs Division,
Saga University

VI-4. Suggestions to ACCU

We found some difficulties and would suggest two following points:

- (1) On the written contract: It should be written not only in English but also in Japanese because not all the university's staff can read the English version accurately.
- (2) On the allowance: the provision of all the allowance at one time would be helpful for accounting.

VI-5. Final Words from the Escorts

We would like to thank all the organisations in Fiji, Tuvalu, and Japan for their support that enabled this programme to be implemented. Without their support, we would not have been able to achieve the goals and yield those fruitful outcomes.

We would like to express special thanks to the University of the South Pacific in Fiji and the Tuvalu campus of it, the National Commission for UNESCO in Fiji and Tuvalu, Tuvalu government, Tuvalu Air Travel & Shipping, the Tuvalu Embassy in Japan, and the Japan Travel Bureau (JTB), Saga branch. We would also like to thank the people in Fiji and Tuvalu who accepted our visits and interviews in their villages and houses.

Lastly, we would like to thank all the people concerned with this programme for their kindness and cooperation.

VII Reference List

Information from USP (delivered to participating students)

- (1) ***Sustainable Development and the Pacific Island Countries***
Pacific Centre for Environment and Sustainable development, the University of the South Pacific, 2005. (A4, 50 pages)
- (2) ***Ilava Ni Navakavu, Finfishes of Vanua Navakavu, Viti Levu, Fiji Islands***
R. R. Thaman, T. Fong, A. Balawa, SPRH-FIO Biodiversity and Ethnobiology Report No. 4, Institute of Applied Science and Faculty of Islands and Oceans, the University of the South Pacific, Suva, Fiji Islands, 2008. (A4, 6 sheets)
- (3) ***Adapting to climate change*** (A4, 15 sheets)
- (4) ***Up in smoke? Asia and the Pacific: the threat from climate change to human development and the environment.***
Foreword by R. K. Pachauri, PhD, chairman of the Intergovernmental Panel on Climate Change. (A4, 25 sheets)
- (5) ***Government of the Fiji Islands: Fijis' Initial National Communication.*** Pacific Islands Climate Change Assistance Programme (PICCAP) & Fiji National Team, Department of Environment, Governmental Buildings, Suva, Fiji Islands. (A4, 79 sheets)
- (6) ***Climate change, impacts, vulnerabilities and adaptation in developing countries.***
United Nations Framework Convention on Climate Change (UNFCCC). (A4, 57 sheets)
- (7) ***From solid waste dumps to sanitary landfills in the Pacific islands: The Fijian scenario.***
Razia Zariff, Acting Senior Environment Officer, Ministry of Environment and Tourism, Fiji. (A4, 11 sheets)
- (8) ***Fiji's institutional and legal framework and their application for waste management.***
Peni Gavadi, Deputy Permanent Secretary for Local Government,

Housing, Squatter Settlement and Environment, Suva, Fiji Islands.
(A4, 8 sheets)

- (9) ***The environment programme for the greater Suva area : A donor perspective.***

Enrico Strampelli, First Secretary (Engineering), Delegation of the European Commission for the Pacific. (A4, 4 sheets)

- (10) ***Sociological dimension of waste management in the greater Suva area.***

Rusieli Taukei, nurse. (A4, 4 sheets)

- (11) ***Waste management in the greater Suva region, Fiji.***

Peter Heckel, Project Manager, Hydroplan Ingenieur-Gesellschaft mbH. (A4, 16 sheets)

- (12) ***Lagoon degradation and management in Yanuca Channel on the Coral Coast of Fiji.***

James P Terry, Priya Kisun, Aminiasi Qareqare, Jyotishma Rajan, School of Geography, Faculty of Islands and Oceans, the University of the South Pacific, Suva, Fiji. (A4, 10 sheets)

- (13) ***South Pacific Regional Environment Programme and the European Union.***

Waste Awareness Baseline Survey for Suva, Apia, and South Tarawa, A-N-D Consultants in Association with Sinclair Knight, Merz Pty Ltd, Suva, Fiji. (A4, 136 sheets)

- (14) ***Information Sheet, Vulnerability and Adaptation Assessment : Buretu Village, Tailevu.***

VIII Annex

VIII-1 Programme Schedule

09/March (Day 1): Travel

13:30 Met at Fukuoka International Airport.

15:30 Departed Fukuoka for Incheon, Seoul.

17:00 Arrived at Incheon.

19:00 Boarded flight for Nadi, Fiji.

10/March (Day 2): Travel

08:15 Arrived at Nadi International Airport.

09:00 Left Nadi Airport with Wilderness Ethnic Adventure.

15:00 Checked into accommodation in USP Upper Lodge.

11/March (Day 3): First day in Fiji

09:00-12:00

Received USP campus tour from Dr. E. Weber.

09:15 Visited CELT (Center for Excellence in Learning and Teaching).

09:30 Visited media center.

10:00 Visited Center for Education Development and Technology.

10:15 Visited Library.

11:30 Visited Lower Campus which has the Faculty of Islands and Oceans (FIO)

13:00-16:00

Made courtesy visit to Fiji National Commission (NatCom) for UNESCO.

13:00 Left USP for NatCom for UNESCO.

13:40 Arrived at Fiji NatCom.

14:00 Made courtesy visit and gave students' introductions and discussion.

12/March (Day 4): First Lectures in Field, Buretu Village

- 08:30 Attended lecture by Fine Lao and briefing by Leone Limalevu.
- 09:10 Moved to Buretu Village in the Rewa Delta area.
- 10:00 Attended Sebusebu ceremony and students' introductions.
- 11:30 Received briefing from Leone Limalevu.
- 12:00 Walked around in the village.
- 13:45 Students gave presentations.
- 16:00 Listened to lecture by Leone Limalevu.
- 17:30 Planted coconuts.
- 18:00 Talked in free exchange.
- 18:30 Enjoyed afternoon teatime.
- 19:00 Attended Sebusebu ceremony for permission to leave the village.
- 19:15 Exchanged songs.

13/March (Day 5): Second Lectures in Field, Waikanake Village

- 09:00 Moved to Vanua Navakavu area, located on the Muavusu Peninsula, east of Suva
- 10:00 Attended Sebusebu ceremony at Waiqanake village.
- 10:30 Participated in field excursion in the village.
- 14:00 Participated in excursion to fishing grounds.
- 15:00 Visited Lami Landfill.

14/March (DAY 6): Travel & First Day in Tuvalu

- 06:30 Left USP for Nausori International Airport.
- 10:00 Departed for Funafuti, Tuvalu.
- 12:30 Arrived at Funafuti Airport, Tuvalu.
- 15:00 Made courtesy visit to Tuvalu National Commission for UNESCO and the Department of Education, Government of Tuvalu.
- 19:00 Attended opening ceremony, made a wish for successful week for the Japanese team and finished off with a prayer.

15/March (Day 7): Fangafale Island Tour/Home Visit

- 09:00 Received Fangafale Island tour.

14:30 Made first home visit.

17:00 Made second home visit.

16/March (Day 8): Sunday, Rest Day

Morning Visited church.

Afternoon Enjoyed free time.

17/March (Day 9): Conservation Area

08:00 Received brief explanation about activity of the day.

08:30 Left for Funafala.

09:30 Arrived at Funafala.

13:00 Went to Fualopa Islet.

14:00 Went to Tepuka Vili Vili Islet.

15:00 Went to Tepuka Islet.

18/March (Day 10): Visiting Facilities in Tuvalu

08:15 Visited Tuvalu Electricity Corporation.

09:00 Visited Water and Sewage Department (Fresh Water Supply).

10:00 Visited Department of Natural Resources and Environment.

11:00 Visited Acting Attorney General's office.

11:40 Visited Princess Margaret Hospital.

14:30 Visited USP Tuvalu Campus.

17:00 Visited landfills.

19/March (Day 11): Visiting TMTI and Department of Education

08:00 Went to TMTI (Tuvalu Maritime Training Institute) on Amatuku Island.

09:00 Received welcome and brief overview about TMTI from the Captain.

10:00 Started TMTI tour and exchange with TMTI students.

13:00 Left TMTI and returned to wharf at 14:00.

15:00 Visited Department of Education.

20/March (Day 12): Inland Flooding & Closing Ceremony

Morning-15:30

Individual research

15:45-17:00

The time of high tide was 16:26 pm.

15:45 Walked to TUFHA conference room.

16:00 Visited Meteorological Office.

16:30 Saw covering of sea water and bubbles everywhere on ground near TUFHA.

17:15 Prepared for Closing Ceremony.

19:00-21:30

Attended closing ceremony (Wrap-up session and reception).

19:00 Attended wrap-up session.

20:20 Attended reception.

21/March (Day 13): Travel

10:30 Checked in.

14:30 Left Fuhafuchi (flight delayed).

16:30 Arrived at Nausori airport, Fiji; returned to USP Upper Lodge

22/March (Day 14): USP Wrap-up session/Suva Market

09:00 Attended first part of wrap-up session (students' presentations).

12:30 Attended second part of wrap-up session (statements from USP facilitators).

14:00 Enjoyed excursion to Suva market.

23/March (Day 15): Travel & Free Time

10:30 Left for Nadi by bus.

On the way, visited:

Bravi Handicrafts (Fiji's craft).

Shingatoka Sandy Dune.

17:00 Arrived At Capricorn International Hotel.

24/March (DAY 16): Travel

07:15 Left for Nadi International airport.

07:40 Checked in.

09:40 Departed Nadi at 09:40 for Incheon.

17:30 Arrived at Incheon, Seoul, went to Incheon airport hotel.

25/March (DAY 17): Travel

05:30 Left for Incheon airport.

08:00 Departed Incheon for Fukuoka.

09:20 Arrived at Fukuoka airport.

09:30 Disbanded.

VIII-2 List of Participants

Escorts

Toshiya Okajima

Associate Professor, Faculty of Culture and Education, Saga University

Junko Okajima

Teacher (English), Senior High School

Students (Saga University)

1 Nanae Oshima

Undergraduate (first-year),
Faculty of Culture and Education

2 Yuko Kikukawa

Undergraduate (second-year),
Faculty of Culture and Education

3 Aki Koga

Graduate (third-year of doctor course),
Graduate Course of Engineering

4 Kumiko Shinohara

Undergraduate (third-year)
Faculty of Culture and Education

5 Sayaka Shibata

Undergraduate (third-year)
Faculty of Culture and Education

6 Nami Nakahara

Undergraduate (first year)
Faculty of Economics

7 Emi Hideshima

Undergraduate (second-year)
Faculty of Culture and Education

8 Kana Hideshima

Undergraduate (first year)
Faculty of Culture and Education

9 Sayaka Mukai

Undergraduate (second-year)
Faculty of Culture and Education

10 Kiyoshi Yoshimizu

Graduate (first-year of master course)
Graduate Course of Nursing

VIII-3 From the Students' Evaluation Form

(1) Overall Impressions:

- (A) Traditional customs have been cherished with natural resources; the protection of traditional culture and custom is important to protect natural environments and sustainable development.
- (B) Could experience traditional culture differing from those of Japan; could learn the relationship between environmental problems and traditional life style
- (C) Falling palm trees, inland flooding, local people's situation is more serious than preciously thought.
- (D) Could have international view on human lives in the future, human broke natural environment, human can live in the nature.
- (E) Could learn international cooperation as very important fact to solve world-wide problems.
- (F) "Seeing is believing," the most important actions were seeing, feeling touching to learn culture, environments, etc, in every spots.
- (G) Could get a lot of ideas through the communication with people about their lives.
- (H) Schedule was too tight to have enough time to investigate all of the interests.

(2) The most useful/valuable activities and the reasons

- (A) Visits to the villages in Suva, Fiji.
 - (i) Could learn the self-sufficient life and the importance to maintain self-sufficient life (traditional lifestyle) to solve environmental problems.
 - (ii) Could learn the impact of climate change on their lands and their lives.
 - (iii) Could learn Fijian culture and exchange with villagers.
 - (iv) Could learn their wisdom of living.
- (B) Visit to the dumping grounds in Fiji and Tuvalu.
 - (i) Serious issue and improvement is needed as soon as possible.

- (ii) The problem is how to treat rubbish and the influence to the people.
 - (C) Visit to the seashore eroded severely and the spot flooded at high tide in Tuvalu.
 - (i) Could learn to make actions not only to think and understand about environmental problem.
 - (D) Wrap-up session.
 - (i) Could learn the importance of not only to study but also to act.
 - (ii) Could get an enthusiasm for solving environmental problems.
- (3) **To maximize the benefit of the programme:**
- (A) Could find a lot of problems not only in Fiji and Tuvalu but also in Japan, and want to study about Japan more.
 - (B) Tell our experiences and the circumstances in Fiji and Tuvalu to many people in Japan.
 - (C) Make educational books, posters, and leaflets, and so on.
 - (D) Participate to the activities of SAGA university to protect environment.
 - (E) Want to reduce rubbish, especially garbage in Fiji and Tuvalu, for example, to introduce “deposit system” to the countries, because it seems to meet their real need.
 - (F) Change our life style, such as mass production, mass consumption, and mass energy consumption.
 - (G) Keep contact with USP and Tuvalu government to discuss and find what cooperation can be made.

VIII-4 Collaborating Organisations

(1) **The University of the South Pacific (USP) (Laucala Campus)**

Dr. Esther Williams,

Acting Vice-Chancellor

Dr. Eberhard H. Weber,

Senior Lecturer in Development Geography and Natural
Resources Management, Head, School of Geography
Faculty of Islands and Oceans

Dr. Randolph R Thaman,

Professor of Pacific Islands Biogeography, Head, School of
Geography, Faculty of Islands and Oceans

Mr. Leone Limalevu,

Research Assistant (Climate Change Project), Faculty of
Islands and Oceans

Mr. Fine Lao,

Fellow – Climate Change & ESD, Faculty of Islands and Oceans

Mr. Alan Resture,

Fellow, Institute of Marine Resources, Faculty of Islands and
Oceans

Mr. Melchior Mataki,

Programme Manager, Pacific Centre for Environment and
Sustainable Development (PACE-SD), Faculty of Islands
and Oceans

Ms. Vijaya Naiker,

Administrative Assistant, the Dean of office, Faculty of
Islands and Oceans

Ms. Lorissa Hazelman,

Administrative Assistant, Department of Tourism and
Hospitality, Faculty of Islands and Oceans

(2) **Fiji National Commission for UNESCO**

Mr. Isireli Seniburu,

Secretary General for Fiji National Commission for UNESCO

Mr. Misiwaini Qereqeretabua,

Director of the Institute of Fijian Language and Culture,
Ministry of Fijian Affairs, Culture & Heritage & Provincial
Department

Ms. Salote L. Dugu,

The principal Education Officer of Technical Vocational
Education Training (TVET)

(3) **The Government of Tuvalu and Relative Organisations**

Hon. Dr. Falesa Pitoi,

Minister for Education, Youth and Sports

Mr. Minute Taupo,

1. the Secretary General of the National Commission for UNESCO
2. Permanent Secretary, Ministry of Education, Youth and Sports

Mr. Panapasi Nelesone,

Acting Secretary of Government (till Jan/2008)

Mr. Solofa Uota,

Permanent Secretary for Education Youth and Sports and
concurrently the Secretary General of the National
Commission for UNESCO (till Jan/2008), Acting
Secretary of Government (after Feb/2008)

Ms. Katalina Taloka,

Director of Education, Ministry of Education, Youth and Sports

Ms. Lanuloa Keleta Fasiai,

Officer, the National Commission for UNESCO

Mr. Mataio T. Mataio,

Director of Environment, Department of Environment

Mr. Pehieri, Noa,

Youth Officer, Ministry of Education, Youth and Sports

Mr. Pisi Seleganui,

Supervisor of the Water and Sewage department, Public Work
Division

Mr. Saaga Talu,

Acting Attorney General

Dr. Stephon Homasi,

Doctor, Princess Margaret Hospital

Mr. Mofalo Rodolufa,

Tuvalu Electricity Corporation

Mr. Taula Katea,

The Director of Meteorological Office

Ms. Sylia Taafaki,

Travel & Shipping Consultant, Tuvalu Air Travel & Shipping

(4) **The University of the South Pacific (USP) USP centre in
Tuvalu**

Mr. David Manuella,

USP Centre Director

(5) **Tuvalu Maritime Training Institute (TMTI)**

Mr. Tofinga Usungafono

CEO and Captain-Superintendent

Mr. Puga Naseli,

Chief Officer

Mr. Tusaga Iosefa,

Marine Instructor

Mr. John Hensford,

Regional manager of Tuvalu's two seafarer employer agencies

VIII-5 Travel Arrangements

Mr. Toru Satoura & Mr. Keiichi Ikejiri,
Japan Travel Bureau (JTB) Saga branch, Saga city

For : air travel (Fukuoka–Incheon–Nadi)
accommodation in Nadi, Incheon Airport Hotel

Ms. Lorissa Hazelman,
Department of Tourism and Hospitality
at Laucala campus, USP, Suva

For : bus (Nadi–Suva–Nausori)
visit to villages
other transportations in Suva city

Ms. Sylie Taafaki,
Travel & Shipping Consultant, Tuvalu Air Travel
and Shipping, at Funafuti, Tuvalu

For : 1 air travel (Nausori–Funafuti)
2 transportation service in Tuvalu (van, boat, taxi arrangement)
3 facilitate visiting places and people
4 guide in Tuvalu (Funafuti, fangafale island, conservation area,
TMTI on Amatuku Island)

VIII-6 Accommodation Places

(1) **Upper Campus Lodge.**

The University of the South Pacific, Laucala Campus, Suva, Fiji

(2) **Filamona Moonlight Lodge.**

Vaiaku area, Funafuti city, Fangafale Island, Tuvalu

(3) **Capricorn International** (in transit)

Nadi city, Viti Leve Island, Fiji.

(4) **Incheon Airport Hotel** (in transit)

Incheon city, South Korea