

# International Sabo Forum 2010

- The birth place of modern Sabo technologies spread to the world · Tateyama Sabo -

October 7, 2010

Skyhall of Intec Building, Toyama, Japan

Organized by

Steering Committee of International Sabo Forum

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~ The birth place of modern Sabo technologies  
spread to the world ▪ Tateyama Sabo ~



October 7, 2010

**Skyhall of Intec Building, Toyama, Japan**

**Steering Committee of International Sabo Forum**

# Outline of the Forum

## ○ Objectives

- The Japanese Government designated Shiraiwa Sabo facilities to the Important Cultural Property. On this occasion, we introduce the cultural value of Tateyama Sabo and that Toyama is the birth place of modern Sabo technology spread to the world.
- We acquire the knowledge about international contribution of Sabo technology which has been spread from Japan to the world and contributed to the disaster prevention in each country.

## ○ Date

October 7,2010

## ○ Venue

SKYHALL of Intec Building, Toyama

## ○ Sponsor

Steering Committee of International Sabo Forum

## ○ Support

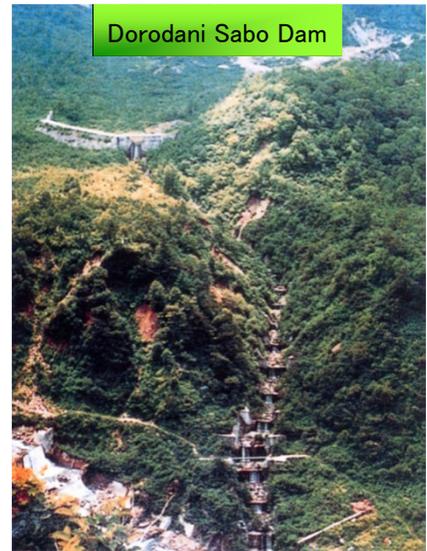
Japan Sabo Association, Japan Society of Erosion Control Engineering, The Japan Landslide Society, Association of Japan Heritage of Modern Era, Toyama Sabo Association, Tateyama branch of Japan Sabo Association, Toyama branch of Japan Association for Slope Disaster Management, Toyama Construction Industry Association, Tateyama Sabo Ladies Salon, Tateyama Caldera Sabo Museum, Tateyama Sabo Special Engineer, Toyama Sabo Volunteer Association, Tateyama-Kurobe Dream Club, Association of Tateyama-Kurobe for Preservation of the Environment and International Sightseeing Promotion, Toyama Prefectural Board of Education



Shiraiwa Sabo Dam



Hongu Sabo Dam



Dorodani Sabo Dam

# Program

13:00 Open

13:30 Opening Remarks

Takakazu Ishii Governor of Toyama Prefecture

Mr.Hiroshi Makino Director-General, Sabo Department, MLIT

(MLIT : Ministry of Land, Infrastructure, Transport and Tourism)

Mr.Tamisuke Watanuki President of Japan Sabo Association

14:00 Keynote Speech

## **The Present Situation and the Future Trend of the World Cultural Heritage Sites**

Mr. Koichiro Matsuura,

the former Director-General of the United Nation Educational,  
Scientific and Cultural Organization (UNESCO)

( Break )

15:10 Speech and Discussion

○ video

○ Speech on Sabo works

## **Sabo works for debris flow disaster reduction in the south American Andes**

Prof. Julio Kuroiwa

Professor Emeritus of the National University of Engineering (UNI)

## **Sabo works and hazard mitigation: the case of alluvial event of August 2003 in the Carnian Alps (north-eastern Italy)**

Dr. Alessandro Pasuto

Research Director at the Research Institute for Hydrogeological  
Protection of National Research Council in Padova, Italy.

## **Global trend of disaster reduction and contribution of Japan's Sabo**

Mr. Hidetomi Oi Senior Advisor, Global Environment Department, JICA

○ Discussion

16:30 Close

# Introduction of The Speaker

## ◆ Keynote Speech

### **Mr. Koichiro Matsuura (Japan), former Director-General of UNESCO**

1959 Ministry of Foreign Affairs

1961– After graduating from the Faculty of Economics of Haverford College, USA, he held the post of Director-General of the Economic Cooperation Bureau, Director-General of the North American Affairs Bureau, and Deputy Minister for Foreign Affairs, and was also Japan's Ambassador to France.

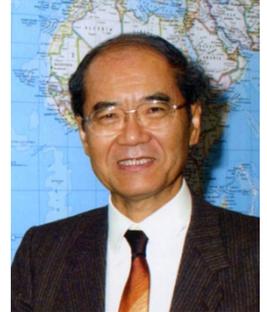
1998 Chairperson of UNESCO's World Heritage Committee

1999 8th Director-General of UNESCO

2010 Special Advisor to Pasona Inc. and other positions

He has been awarded honorary doctorates from more than 50 universities, including the University of Lyon 3 (1997), Renmin University of China (8/2001), Moscow State University (11/2003), Haverford College in the United States (5/2006), University of Santo Tomas Philippines (5/2006), Kyung Hee University in South Korea (7/2008).

He has also been awarded with more than 70 orders and honorary citizenship from many countries around the world for his international contribution in the fields of culture, science, and dialogue among civilizations.



## ◆ Speech on Sabo works

### **Prof. Julio Kuroiwa (Peru)**

**Professor Emeritus of the National University of Engineering (UNI), Lima, Peru**

Disaster Risk Reduction investigator and consultant for 40 years

International Consultant for several United Nations and Organization of American States (OAS) agencies

1961-62, 75-76 made graduate studies at the IISSE

1990 Received the United Nations Sasakawa-UNDRP Disaster Prevention Award

2004~ Honorary Member of the International Association for Earthquake Engineering (IAEE)



### **Mr. Alessandro Pasuto (Italy)**

**Research Director at the Research Institute for Hydrogeological Protection of National Research Council in Padova, Italy.**

His expertise mainly deals with applied geomorphology and engineering geology with special reference to landslide hazard assessment and monitoring.

2003 Established GRJL, Italy-Japan Joint Laboratory on Hydrogeological Risks

Foundation member of TellNet, International Disasters Transfer Live Lesson Network

Member of the Executive Committee of the CERG, Member of IAEG, IAG, and JGU



### **Mr. Hidetomi Oi (Japan)**

**Senior Advisor, Global Environment Department, JICA**

1962 Ministry of Construction, Mainly in charge of disaster prevention and water resources development

1973 Ministry of Foreign Affairs (Economic Cooperation Department)

1977 ESCAP Typhoon Committee (Manila)

1981 Office of United Nations Disaster Relief Coordinator (Geneva)

1990 Senior Advisor, Global Environment Department, JICA

He was awarded by the King of Nepal for his distinguished contribution to disaster prevention while he was a first chief advisor of the Project for Disaster Prevention Technical Center in Nepal.



## Governor's address at the opening ceremony of the International Sabo Forum 2010

Takakazu Ishii  
Governor of Toyama Prefecture



Good afternoon, Ladies, and Gentlemen. It's a fine autumn day, today.

Today, with the outstanding attendance of Mr. Watanuki, the former Speaker of the House of Representatives and President of Japan Sabo Association, and Mr. Makino, Director-General of Sabo Department, Ministry of Land Infrastructure and Transport, and many distinguished guests, as well as Mr. Matsuura, the former Director-General of UNESCO and other experts from both within and outside of Japan as lecturers, we are honored to have had the opportunity to host the International Sabo Forum. I would like to express my deep appreciation to all those present, including many citizens of Toyama for attending the forum.

It is my special pleasure and privilege to offer my warmest thanks to the Ministry of Land, Infrastructure and Transport for their support and cooperation to our forum today. I am also pleased to be able to welcome many guests from other prefectures, not least the officials of Japan Sabo Association, and I would like to extend my warmest welcome to all of them.

As you are well aware, Toyama Prefecture has a dynamic topography dominated by the 3,000-meter-high Tateyama mountain range, and the 1,000-meter-deep Toyama Bay, within a distance of only 40-50km, connected by globally unrivalled swift torrents, which run through the Toyama Plain. Because of these environmental conditions, Toyama Prefecture had continuously suffered from floods and other disasters. Among other things, about 150 years ago (during the Ansei period), the Hietsu Earthquake caused a large sediment discharge, and as much as 200 million m<sup>3</sup> of sediment in the Tateyama Caldera ran downstream and claimed hundreds of lives of residents living downstream. Confronted by this situation, it had to be overcome. The history of our prefecture has been tantamount to a history of a battle with water.

The Tateyama Sabo is the culmination of our efforts. Three years ago, The Agency for Cultural Affairs invited applications for the World Heritage Site inscription from local governments. We filed the candidacy of the Tateyama

Sabo for the World Heritage Site, in consultation with concerned municipalities, the Ministry of Land Infrastructure and Transport, and the citizens of Toyama who are concerned with the matter.

In September of 2008, the Cultural Affairs Agency released the result of the screening. The Tateyama Sabo fell under Category II, with an added note saying that “the sabo technologies can be highly evaluated, even from the global standard. However, regrettably, the global evaluation or appreciation of the sabo itself has not been established yet. The Cultural Affairs Agency cannot file a document to UNESCO with confidence that the Tateyama Sabo has outstanding and universal values at present. We hope that you will redouble your efforts to gain this recognition.” We need to make efforts to make up for the shortage that was pointed out.

Fortunately, in June of last year, the Tateyama Sabo was designated as an Important Cultural Asset for the first time in Japan as a sabo facility. In addition, the same efforts are being made with the Dorodani Sabo Dam and the Hongu Sabo Dam toward the designation of the Important Cultural Asset, by having invited the officials of the Cultural Affairs Agency and investigators. In conjunction with these efforts, in order to obtain global evaluation, we held the 1<sup>st</sup> International Sabo Forum, inviting Mr. Stuart B. Smith, Secretary of the International Committee for the Conservation of the Industrial Heritage, and other experts from overseas. This year, we have hosted the 2<sup>nd</sup> forum, with the outstanding attendance of Mr. Matsuura, the former Director-General of UNESCO, who I asked for advice when I visited him in Paris last year, Professor Emeritus Kuroiwa from Peru, and Dr. Pasuto from Italy, and Mr. Oi, Senior Advisor of JICA as lecturers. We hope that audience today will listen attentively to the lecturers, and use their guidance and suggestions as a significant leap forward in the future. We also hope that, with support and cooperation from the citizens of Toyama and from people all over the country who are concerned with sabo, the significance of the Tateyama Sabo will be widely understood among people within and outside of Japan, and the Tateyama Sabo as “a model of great Japan to disaster prevention system” will impress the world, hopefully contributing to its inscription on the World Heritage Site List.

I shall close my greetings with the hope that the forum will be a great success, and by wishing everyone present continued health and happiness. Thank you very much.

## Opening Remarks

Mr. Hiroshi Makino  
Director General, Sabo Department  
Ministry of Land Infrastructure,  
Transport and Tourism



Good afternoon, ladies and gentlemen. My name is Hiroshi Makino, Director General of Sabo department, Ministry of Land, Infrastructure, Transport and Tourism. First, allow me to extend our gratitude to all for showing continuous understanding and support to the government's Land and Transport administrations, in particular, to the Sabo works. Today, it is my pleasure to offer congratulations for holding the International Sabo Forum on this grand scale, with the attendance of distinguished guests and many citizens.

The history of sabo in Japan dates back to the 7<sup>th</sup> century when a constitutional form of government called Ritsu-ryo system was established in Japan. Under this national system, the government of those days restricted the logging of forests to control sediment runoffs. This fact tells us that sediment runoffs posed a big problem for the people of those ancient days.

In the Japan's Edo Period between 17<sup>c</sup> and the middle of 19<sup>th</sup> century, when many castles were constructed including the splendid Toyama castle here, sabo dams were built utilizing castle building techniques. It was exactly this time in the history in 1858, about 150 years ago, when the Mt. Tombi collapse occurred triggered by Hietsu Earthquake. The damages were colossally serious. With the subsequent sediment runoff, the riverbed of the Joganji River got elevated, and the sediment from the caldera kept causing trouble for a long time to come.

In the Meiji Period, when the Shogun era ended and a modern Japan was established, under the policy of increasing national wealth and military power, industrialization became an urgent need. That was why controlling sediment runoffs from devastated mountains became the key to Japan's successful economic development. It was in 1906 when the Toyama Prefectural government started working on the Tateyama Sabo.

In 1907, Sabo Law, the foundation of a nation, was enacted. A legal structure for sabo was developed as a framework of a modern nation, along with laws for rivers and forests. And in 1926, Tateyama sabo works went under the direct control of the national government, which had been a long-cherished wish of

the Toyama citizens. A long and rugged access to work sites, an altitude of more than 1,000 meters, debris flows or a large amount of sediment runoffs occurred at every rain, and winter snow....these are the difficult and challenging environment where sabo techniques have been cultivated in Tateyama. Sabo techniques developed in Tateyama have spread to all corners of Japan. They have become the center of Japan's sabo technology.

After the two world wars, Japan, which made a fresh start as a peaceful nation, strived to provide technological cooperation to countries which suffer sediment-related disasters. Japan's Sabo technologies originating in Tateyama have been provided not only to Asian nations such as the Philippines, Indonesia and Nepal, but also to the world including Central and South America such as Peru. Recent development in this field is a joint research with other countries including Italy via INTER-PRAEVENT.

Looking back at the history of sabo both in Japan and abroad reveals the role that the Tateyama Sabo has played and its future mission that it should achieve. Sabo is a human approach to nature for ensuring safety and wealth to people who live in a limited land with limited resources. It is not about conquering nature, nor about simple nature worshipping. I believe that sabo represents a wealth of culture developed in Japan's 2,000- year-plus history in this harsh but abundant nature.

In the 20<sup>th</sup> century, there were struggles among nations to win hegemony over vast unexplored land, but what have become clear over a long period of time is that humans have no other choice but to live on earth with limited resources, establishing harmony with nature.

Natural disasters including sediment-related disasters caused by climate change are expected to increase their number in the world. It is our belief that Japan's sabo culture and technologies that started here in Tateyama will help the world become more harmonious with nature.

From Tateyama to the world, we wish sabo philosophy, harmony with nature, will emanate. Congratulations and best wishes.

## Opening Remarks

Mr. Tamisuke Wananuki  
Chairman, Japan Sabo Association



I'm Tamisuke Watanuki, the President of Japan Sabo Association. For the opening of the International Sabo Forum 2010, I would like to say a few words.

Our country has geologic features such as steep torrents and unstable soil. In addition, it is prone to earthquakes, volcanic eruptions, typhoons and torrential rains. In such a small country, people are engaged in various activities for their livelihood. Interacting with each other, they have caused numerous sediment-related disasters. We don't even have to look at history. Faced with such harsh natural environment and catastrophic disasters, we have reformed our social mechanisms, made technological progress and continued to promote remarkable development.

In other words, without the idea of disaster prevention or the disaster prevention administration, Japan's development and prosperity should have been impossible. The symbol of Japan's commitment to disaster prevention is the basin of the most raging river in Japan, the Joganji River. The local inhabitants and government have made concerted efforts to face the challenges posed by hazards and have dedicated themselves to reducing disasters. The rest is history.

I was brought up here in Toyama and later engaged in disaster prevention for a long time as a politician. In my capacity as the commissioner Director-General of the National Land Agency on some occasions and as the Minister of Construction and the Speaker of the House of Representatives on other occasions, I visited this area. Currently as the President of Japan Sabo Association and a Sabo expert, I am one of those who know well that the Joganji River brings both benefits and also brutal disasters.

In 1926, Toyama prefectural Sabo projects were taken over by the central government. Back then, the founder of Japan Sabo Association, Dr. Masao Akagi was appointed first director of the Tateyama Sabo Office. Japan's Sabo technology, which we can boast to the rest of the world, was applied to the Joganji River. He recognized the importance of Sabo works here in Tateyama and founded Sabo Association in hopes of further promotion of Sabo works. I

wonder if he was predestined to lead such a life.

Both natural and human induced factors cause sediment discharge, which could destroy natural environment. Restoring a peaceful natural environment and mitigating the threat to human livelihood posed by nature are what Sabo works do. Significant accomplishment has been made for a long time in Tateyama, a mecca of Sabo works.

Nowadays, in both developing and advanced countries, due to global warming or other reasons, devastating disasters frequently occur. The world urgently needs Japan's Sabo technology. Under these circumstances, the International Sabo Forum takes place for the second time in succession. To make strenuous efforts to have the Tateyama Sabo inscribed on the World Heritage list is very timely.

Japan Sabo Association, along with Toyama Sabo Association and Tateyama branch, is determined to support your effort to achieve the goal.

It has taken 100 years for the Joganji River to be as it is, but it is not the end. To make the Joganji River better for tomorrow, it is crucial to make a steady effort. In disaster prevention, preparedness on a daily basis can bear fruit at the critical moment.

In conclusion, I hope that the International Sabo Forum this year will succeed in helping the rest of the world know more about the Sabo technology including the Tateyama Sabo, which is the pride of Japan. I also would like to take this opportunity to express my hope that Toyama Prefecture will further flourish, and that the Tateyama Sabo will be inscribed on the World Heritage List as soon as possible. Thank you very much.

## The Present Situation and the Future Trend of the World Cultural Heritage Sites

Mr. Koichiro Matsuura



Good afternoon, everyone. Allow me first of all to express my gratitude to Governor Ishii for inviting me to this forum. As he mentioned earlier in his address, it was just one year ago, just before I resigned from the post of Director-General of UNESCO, which I had held for 10 years until November 14, 2009, that he visited me in my office in Paris all the way from Toyama, and said “We would like to have the Tateyama Sabo inscribed on the World Heritage Site list, and we were wondering if we could benefit from your expertise.” To be honest, his statement surprised me at first. Although I had held the post of the Chairman of the World Heritage Committee, had written several books on the World Heritage, and had been well informed about the World Heritage, sabo work and World Heritage were not necessarily associated in my mind. While I was listening to the governor, however, I was gradually convinced of his idea and told him that it was a very good approach, but that there would be many hurdles to overcome. Then, the governor asked me to visit Toyama when I came back to Japan. I came back to Japan at the beginning of this year, and currently I am based in Tokyo, giving lectures throughout Japan and in other countries. It is with great pleasure that I join you in Toyama today after a long absence from these parts.

I also have the pleasure of meeting and talking about old times with President Watanuki, who I would like to thank for his long-standing support while I was working for the Ministry of Foreign Affairs. The late Prime Minister Keizo Obuchi and I went to the same junior high school, and had been on friendly terms up until his demise. When I was elected Director-General of UNESCO, he was in office as Japan’s Prime Minister. He offered to serve as my campaign strategist in practice, not nominally, saying that he would take on the role of a campaign strategist because I had no experience in elections and he had won 13 straight elections in very competitive constituencies. I really thank him for his kind assistance. Today I feel delighted to see President Watanuki after a long absence, who was close to Mr. Obuchi for so long.

Today the title of my lecture is “The Present Situation Of The World Heritage And Challenges For The Future,” and I will talk about general things. Earlier today I had an opportunity to see the Tateyama Sabo from above while flying in a helicopter. So I will also include my impression of that tour in my talk.

In fact, there are five stages before a monument can be inscribed on the World Heritage Site list, and the first stage is a good preparation before making headway. I think you did very well in this first stage and have made a good head start. However, there are four more stages ahead. You should prepare yourself well for the long way yet to go, and make efforts under the leadership of the governor. This is true of any World Heritage Site. Of course, strong leadership is necessary, and without it you can not move ahead, but it also takes concerted efforts of the local community. Many preparations and procedures are necessary for the inscription on the World Heritage Site list, so I would like to reiterate the importance of the efforts of the entire community.

First, I will explain what will take place after the second stage and then move on to the subsequent upper stages later in turn. The second stage is the inscription on the tentative list of the World Heritage candidates. The inscription is decided by the Japanese government. UNESCO is not directly involved in the process, but the list has to be registered at UNESCO. Today's newspaper says that two provisional candidates have been put on the tentative list, raising the number of the World Heritage Sites in Japan from 12 (11 cultural heritage sites and 1 natural heritage site) to 14 (13 cultural heritage sites and 1 natural heritage site). These two candidates to which conditions were attached are: "the group of ancient tombs in Osaka dating back to 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> centuries," and "the Sado Gold Mine". Their conditions were met and they were put on the list, raising the total to 14.

As you are all aware, Japan has 14 World Heritage Sites. Last night, I stayed overnight at one of them, the historic village of Gokayama, which marks its 15<sup>th</sup> anniversary since being added to the inscription. Since I had visited Shirakawa-go in Gifu before, I felt extremely happy to have had a chance to see some of Gokayama in Toyama today. The gassho-style houses in Toyama and those in Gifu form a single World Heritage Site as "Historic Villages of Shirakawa-go and Gokayama." That means they succeeded in going through these five stages toward their inscription. The World Heritage inscription or the role of the World Heritage Sites has come to a major crossroad in Japan as well as in the world.

The World Heritage Convention was adopted thirty-eight years ago in 1972, and enacted three years later in 1975. As a matter of fact, the year 2012 will mark the 40<sup>th</sup> anniversary of the adoption of the World Heritage Convention. The Japanese Government has been proposing to host the 40<sup>th</sup> anniversary event in Japan, and has obtained UNESCO's acceptance. Therefore, in 2012, to be more specific, on November 16, the 40<sup>th</sup> anniversary event will be held in

Japan. The venue and form will be decided in consultation between the Japanese government and UNESCO. The anniversary event will be held on November 16, because the World Heritage Convention was adopted on that day in 1972. Since then the World Heritage Committee has been held annually.

As was mentioned in my career profile, I held the post of the Chairman of the World Heritage Committee for a year, and then that of the Director-General. Prime Minister Obuchi served as a campaign strategist and I was fortunately elected out of 11 candidates, winning after a fierce competition. I assumed the post of the Director-General on November 15, 1999. About a year before that, from the period between the end of November and the beginning of December 1998, the World Heritage Committee was held in Kyoto. In accordance with the customary practice, the meeting was supposed to be chaired by the host country. I was the ambassador to France at that time, and the Japanese government requested that I serve as a chairman. I accepted the offer and chaired the meeting for 10 days starting at the end of November. As a matter of fact, the term of office of the chairman is one year and I held the post throughout that year before I assumed the office of the Director-General.

Let me return to the subject. It is 38 years since the World Heritage Convention was adopted, and 35 years since its enactment. For some reason or other, at first, Japan did not take any action toward the ratification of the convention. Probably you may wonder why they did not. I share your feeling, but from my long experience as an official of the Ministry of Foreign Affairs, I do know how much it takes to ratify one single convention. And I assume President Watanuki knows this well, too. A convention should go through a rigorous examination by the Cabinet Legislation Bureau. And it will be followed by the laborious work of revising domestic legislation in consultation with the ministries concerned. Looking back, I feel the World Heritage Convention was put on the back-burner, considering whether its benefit was worth the trouble. However, in 1992, twenty years after the adoption of the convention, Japan finally ratified it, after having gradually been prompted and facilitated by the Diet since the end of the 1980's. I think it was very good. I think, the reality was it was ratified, after having been pressured by the government, the Diet, and public opinion. However, after the ratification, Japan became a fully active member.

There are now 187 signatories, but the World Heritage Committee members are limited to 21 countries. Their term is six years, and the election is very competitive. Looking back, at its inception no one would have thought the members would add up to as many as 187. For your information, UNESCO has 193 member states, so there's a possibility that a few will still be added to that

number. No one imagined so many countries would ratify the convention. It was decided that the committee should comprise 21 states with a term of 6 years. Japan became a committee member twice. In recent years each country customarily announces its candidacy on condition that they cut down the six-year term to a four-year term for the purpose of committee member rotation. Japan was a committee member for 6 years the first time, and for 4 years the second time. In the near future, Japan will file its candidacy, but there will be very tough competition.

However, in order to be committed to the World Heritage system, or to be able to contribute to it, you need to become a member of the World Heritage Committee. But becoming a committee member doesn't necessarily guarantee benefits in promoting the inscription of the site in your own country. It is quite another thing. When the site in your country is in question, you cannot join in voting or deliberation. There is a tacit understanding among members that you should refrain from being involved in that case. Although you can't campaign directly as a committee member, it will give you some indirect benefit in promoting the inscription of the site in your country. Yet, the main objective of becoming a committee member should be contribution in solving any problems which may have arisen during approximately 40 years after the adoption of the Convention, rather than promotion of sites in Japan.

Every year, there are over 30 candidate sites. At present each of the member states, or 187 signatories, has the right to submit annually one candidate for the World Cultural Heritage and one for World Natural Heritage. Of course, not every state exercises their right, but they do have that right, anyway. No country has the right to submit two candidates at a time, and they need to narrow down to a single candidate, if there is more than one. Currently Japan has many candidates for the World Cultural Heritage Sites, and 13 of them are on the tentative list. In addition, there are many more candidates, including the Tateyama Sabo, which are not on the list. These candidates will be narrowed down to only one every year. Although, as I mentioned earlier, putting the site on the list is at the discretion of the Japanese government, considering the subsequent 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> stages ahead, the government will narrow down the candidates in the second stage. Therefore, even if a local government pushes its own candidate for a World Heritage Site, it won't be automatically put on the list. The nominations are deliberated in a business-like manner in the meetings held by each Ministry to be shortlisted to the final candidates that deserve to be on the tentative list.

Let me go back to the Tateyama Sabo. The preparation in the first stage has already started, and now efforts are being made with a view to inscribing it on

the tentative list in the second stage. I suppose the International Sabo Forum is a part of these efforts. It was held last year, and I hear that the third forum is planned for next year. I think this is very good. Various comments and opinions of experts who are invited from both within and outside of Japan should be referred to in order to make a good preparation in the first stage. Then you can move on to the second stage for nomination to be put on the tentative list. I have repeated that the World Heritage has come to a turning point. Since 1975, when the Convention was adopted, the system has been implemented for 35 years, and UNESCO and concerned states have had a large amount of accumulated knowledge. In the beginning, the primary aim was to increase the number of World Heritage Sites, starting at zero. The World Heritage is defined as having an outstanding, universal value. In plain words, whereas national treasures or important cultural assets are treasures by one nation, the World Heritage Sites are treasures for all mankind. Therefore, it is defined as having a “universal value”. That means Japan’s cultural assets must have a very important value to the whole of human kind to be inscribed on the World Heritage Site list. Only when it is deemed to have a universal value, can Japan’s cultural asset be inscribed on the World Heritage Site list. I will reiterate because it is very important. A universal value is a very important concept. The value to Japanese nationals is not a sufficient condition and it has to have value to the whole world, the whole of human kind. This is the difference between national treasures and the World Heritage Sites. In the beginning, however, the importance was attached to an increase in number, and in some previous years, 30 to 40 new inscriptions were added per year.

The second stage is to have candidates on a tentative list, based on the judgment of each county. Then, in the third stage, the nation picks out a single candidate from the list and submits it to UNESCO. At this point, having a “universal value” is not enough, and in accordance with the selection criteria (6 criteria for cultural heritage sites, and 4 for natural heritage sites), which criteria apply to the site should be well documented. The comments and opinions of the experts should be well referred to and which criteria are met should be specified. For your information, technically, gassho-style houses in Shirakawa-go and Gokayama meet criteria IV and V. Criterion V is “representative of human interaction with the environment.” Criterion IV is “an outstanding example of a type of building, architectural or ensemble which illustrates (a) significant stage(s) in human history.” Thus, the gassho-style houses meet criteria IV and V. There are Criteria I, II, III and VI, as well. Criterion I is “a masterpiece of human genius.” In Japan, Horyu-ji Temple, with its wooden architecture, is a good example of meeting Criterion I, a masterpiece of human genius. The second criterion is, “an important interchange of human values, over a span of time or within a cultural area of the world.” Kyoto and

Nara meet this criterion. In particular, Nara is located at the east end of the Silk Road, and it represents Japan's Buddhist art which had been introduced through the Silk Road via China and the Korean Peninsula, which has developed into a Japanese style of art, based on intercultural interchange. The example that meets the third criterion is the "Nara era." The World Heritage Site in Nara comprises eight shrines and temples. Incidentally, Criterion VI is "to be directly or tangibly associated with events or living traditions." A Japanese example of this is the Atomic Bomb Dome. I think many of you have seen it, but if you had no background knowledge about it and were told that it is a World Heritage Site, you would surely be taken aback. You would surely wonder why this dilapidated building could be inscribed on the World Heritage Site list. But you can value it because of the knowledge that it symbolizes the building on which the first atomic bomb in human history was dropped. Although this is a negative event, it has an outstanding universal value, and meets Criterion VI. Therefore, Criterion VI is very difficult to apply.

I'll take another example. I wonder if you know about this. I graduated from Haverford University, which is in a suburb of Philadelphia, Pennsylvania. Independence Hall is located in the center of Philadelphia. Here again, if you had no knowledge of the building, you would surely wonder why this could be a World Heritage Site, even though you may admit that it is a beautiful building built in the period when the U.S. was a colony of England. It is unlike the case of Horyu-ji Temple, whose beauty no one would doubt even without any knowledge. It is a good example of Criterion I, a masterpiece of human genius, or the expression of human creativity. Independence Hall in Philadelphia represents the American colonial period, but you would naturally wonder why it could be a World Heritage Site. But it is significant. The United States won the War of Independence over England, and built it when they became independent. Therefore it represents independence of the U.S. and meets Criterion VI. That's why it was inscribed.

I'll return to the previous subject of the selection criteria. These criteria have remained unchanged since the beginning. However, the contents have gradually changed, adopting the changes that took place afterwards. In the second stage, which criteria among six selection criteria are met are not specified. Technically speaking, you don't have to meet all six criteria. A single criterion will do. Meeting a single criterion can be enough for a World Heritage Site. The earlier-mentioned gasho houses meet criteria IV and V, but some World Heritage Sites in other places only meet one criterion. However, from a commonsense standpoint, meeting a multiple criteria is preferable. So two or three, sometimes four criteria are cited when a document is made, but that may be too much. Criterion VI is difficult to apply. If you would apply Criterion VI,

you may be refuted that it is obviously an event in your domestic history. Thus, Criterion VI should be used with care. In addition, Criterion I, a masterpiece of human genius, which Horyu-ji Temple meets, as well as Himeji-jo Castle, should not be applied too often without thoughtful consideration.

Well, the situation differs one by one, but let me return to the Tateyama sabo. Which criterion or criteria should be applied needs to be estimated and decided on by the opinions of experts, and they should be well documented, based on collected data. This is the third stage. It would be better if that process is finished before the prospective site is put on the tentative list, but this is not necessarily a prerequisite. However, in the third stage, that process is required in narrowing down candidates and submitting the document to UNESCO.

Among 14 candidates on the tentative list, only one is a candidate for natural heritage--- the Ogasawara Islands, which are now under deliberation. I feel rather optimistic about it, and think that they will be accepted when the World Heritage Committee will be held in Bahrain in June of next year. Then there will be no more candidates for natural heritage sites in Japan, and I think we should come up with more of them. Putting that aside, we have 13 candidates for cultural sites, and there are many more, like the Tateyama Sabo, which haven't even reached the second stage. These candidates are submitted to UNESCO not necessarily in the same order as they were put on the list. You may think the Tateyama Sabo will not be put on the tentative list unless these 13 candidates have all been processed. This is wrong. Good preparation for the 3<sup>rd</sup> stage is important. So even if candidates are on the list for a long time, without a good preparation for the third stage, they cannot proceed to the 3<sup>rd</sup> stage, because the Japanese government would think that they would not be able to move on to the 4<sup>th</sup> and 5<sup>th</sup> stages. Therefore if you would like your candidate to proceed to the 3<sup>rd</sup> stage, it should be clarified which of the criteria can be met and also it should be well documented in consultation with experts. With good documentation, it is possible that the Tateyama Sabo will be submitted before other candidates which were put on the list prior to it. For that reason, I would recommend a good early preparation.

The fourth stage is crucial. The fourth stage is a technical evaluation of the candidates submitted in the third stage. ICOMOS, an international NGO, which was established by UNESCO in the 1960's, is in charge of the cultural heritage sites. The other is IUCN, which was established earlier in the 1950's, also by UNESCO. At present they are international NGOs independent from UNESCO. They are the NGOs most closely connected to UNESCO. ICOMOS conducts technical evaluation of cultural heritage sites, and IUCN evaluates natural heritage sites.

As I mentioned earlier, the Ogasawara Islands have moved up from the third to the fourth stage. In June, I met two experts who had visited the islands. By the way, Hiraizumi couldn't make it. It was not a complete failure, as it was able to get a deferral status. Based on that, they made a submission again, and an expert came from ICOMOS in the middle of September and requested a meeting with me, which was not realized because of my schedule. Therefore I don't know what evaluation the ICOMOS expert will make at this moment. I only know that the proposition itself was far better than the first one. But what evaluation ICOMOS will make is the key. I have said earlier that Japan has 14 World Heritage Sites, and succeeded in inscribing 14 sites consecutively, but it couldn't make it for the 15<sup>th</sup> time with Hiraizumi. Hiraizumi was not accepted but deferred. As a matter of fact, the 14<sup>th</sup> candidate, the Iwami Ginzan, Silver Mine, was a close call. Unfortunately, in the 4<sup>th</sup> stage, ICOMOS made a negative evaluation. Their technical evaluation didn't admit that it had an outstanding universal value. Moreover, it was unlike a general conclusion but they examined each criterion one by one and concluded that it could not meet any of them at all. It was a rather harsh conclusion. I myself feel that conclusion was unduly harsh, although some of the evaluations are reasonable. The Japanese government, pointing out this undue evaluation, conducted a diplomatic campaign. As a result, the negative evaluation made in the fourth stage was overturned in the discussion in the World Heritage Committee in the fifth stage, resulting in the inscription of the Iwami Ginzan. In the case of Hiraizumi, the 15<sup>th</sup> candidate, ICOMOS gave an even harsher evaluation. The Japanese government found it problematic and difficult to overturn ICOMOS's decision with diplomatic efforts, again, two years in a row and accepted their decision of deferral.

To be exact, there are four different decisions ICOMOS or IUCN can make. The positive one is "inscription." There is no problem in regard to that. At the other extreme is "rejection." If you get this decision, the proposal will usually be withdrawn, because that status will be perceived as a stigma, and it will be very difficult to restart. So if you receive a rejection, the proposal will usually be withdrawn. In between, there are two statuses: "referral", or reevaluation with more information, and "deferral". I don't usually distinguish between these two statuses in my lecture and call them together "postponement," although there is a slight difference between the two. Hiraizumi got the deferral status two years ago. This time they made a more focused proposition, which I expect to be a much better one. But I don't know what evaluation the ICOMOS expert has made.

Based on the expert's evaluation, the Japanese government will make

documentation and it will be discussed in the sub-committee of ICOMOS. Therefore, the evaluation of the expert who inspected the site is important. But at the same time, the Japanese government's proposition, which will be voluminous documentation, will be a key. In the past an expert made an inspection for about a week, and more than one expert visited. Recently, they cut down on expenses, because UNESCO doesn't give them enough subsidies. Therefore, ICOMOS cannot send two or three experts, and they sometimes cannot even stay for one week, making only a quick visit. The inspector's opinion is important, but that is not all that matters. The documentation in the third stage carries weight. Based on the documentation and the opinion of the inspector, experts in the subcommittee make various deliberations as to which criterion, for example, criteria II, III, or V are met and then form a conclusive opinion. That's the fourth stage. If you get a positive result, there will be no problem. In the history of UNESCO, there has been no incidence where the committee has given a negative conclusion despite ICOMOS's positive evaluation. Therefore, if the evaluation is positive at this stage, it will not fail to pass the committee. On the other hand, recently a problem has arisen from the viewpoint of UNESCO. Although negative opinions used to be valued in the past, the World Heritage Committee has been politicized, and experts' opinions are sometimes overturned. In the case of the Iwami Ginzan, silver mine, there was a good reason for the overturn, but like in any international election, "you scratch my back and I'll scratch yours" type secret deals behind closed doors are frequently made. ICOMOS and IUCN consider this to be a problem. The negative evaluation of the site without an outstanding universal value has been more frequently reversed. I also think this is a problem.

As I mentioned earlier, the 40<sup>th</sup> anniversary of UNESCO's World Heritage Convention will be held in Japan in 2012. The 30<sup>th</sup> anniversary was held in Venice, Italy in 2002, according to the proposal of the Italian government. Prior to that, the World Heritage Committee was held in Hungary, where the Budapest Declaration was adopted. When the anniversary is held in Japan, the declaration that bears the place name of the venue will be adopted, I suppose. The Budapest Declaration and the Venice Declaration were adopted in Budapest and Venice, respectively. The main feature of the Budapest Declaration was "the maintenance of credibility of the World Heritage." The World Heritage is a treasure for humankind, so if many people doubt the quality of the World Heritage, its credibility will be lost. Like the afore-mentioned Atomic Bomb Dome, if its background would be explained, you could be convinced of its value. It is all right if after listening to explanations, only a limited number of people would doubt the credibility of the site even after a detailed explanation, but you need to avoid the situation where many people would have such doubt. That is the basic principle of UNESCO: the

credibility of the site. That's what was underscored the most during the 30<sup>th</sup> anniversary events, as well as in the Budapest Declaration and the Venice Declaration.

As mentioned earlier, the World Heritage has come to a turning point. In Brasilia, 21 new sites were added, but none of them were sites in Japan, and Japan was not directly involved. However, if I would try to find any site related to Japan, it would be the Bikini Atoll in the Marshall Islands. Japanese newspapers took it up because Japan had been unfortunately inflicted with the impact of the H-bomb tests done there. This is a negative World Heritage Site, like the Atomic Bomb Dome. With the addition of 21 sites to the list, the total number has reached 911. It is expected that about 20 sites will be added each year, and the total number will surpass 1,000 at some stage. With so many World Heritage Sites around the world, the examination of each proposition in the 4<sup>th</sup> and 5<sup>th</sup> stages is supposed to be more rigorous. This is what I mean by the turning point.

There is another change in the turning point. Now that the number of existing sites has increased, the primary objective of increasing the quantity in the past will be replaced with the objective of maintenance of the values of existing sites and handing them down to the next generation. Actually, that is the primary aim of the World Heritage Convention; by approving the sites as a World Heritage Site or human treasures, the values of World Heritage Sites should be managed and maintained, and passed down to the next generation. Therefore an inscription on the World Heritage Site is not the end of the battle. I said there are five stages prior to the inscription. As a matter of fact, from UNESCO's viewpoint, the inscription is a starting point.

Maintaining the outstanding universal values after being inscribed is of vital importance. "A universal value" is a prerequisite for the inscription, however. Whether you have a system of maintaining the value is evaluated in the inscription process. Without the maintenance system, even the site which has a value would not be inscribed. Let me look back on some recent history. As you are aware, the two large Buddhas in Bamiyann were destroyed in Afghanistan. Their intentional destruction by then the Taliban administration was a great tragedy for mankind, but they had not been inscribed on the World Heritage Site list. The government of Afghanistan had applied the Buddhas to the World Heritage Committee around 1983 or 1984. I was not involved in the case at that time, but the committee concluded that they definitely had an outstanding universal value and there was no objection to their being inscribed as a site. However, there was no management plan whatsoever. Therefore it was sent back to the government with the request of making a management plan. But after an invasion by Soviet forces followed by a terrible civil war, the

Afghanistan government couldn't possibly deal with the request. Eventually, the Taliban took over the country and the Buddhas were destroyed. That's really too bad. As Director-General of UNESCO, I put in efforts to save them, but unfortunately I was not successful. The Buddhas in Bamiyann represents a case where, in spite of its outstanding universal value, the lack of maintenance and management plan prevented it from being inscribed.

As for the Tateyama Sabo, the process from the second stage to the third stage is crucial. Which criteria can be met should be well documented. Furthermore, how it can be maintained and handed down to the future is of significance. In maintaining, the core zone, which is villages in the case of the gassho houses, as well as a buffer zone, which is probably forests, should be intact and maintained in the original state at the time of inscription. But Japanese houses are made of wood, and gassho-style houses have to be thatched every 15 years. In that case, housing should be rehabilitated on condition that the same kind of materials would be used, and the same crafting technique and the same construction method would be applied. Anyway the forests should remain untouched. Since gassho-style houses are surrounded by forests, the problem of landscape preservation will probably not apply to them. Recently, great importance has been attached to landscape, and buildings that will harm the landscape cannot be built even outside of the buffer zone. While I was working for UNESCO, I experienced many examples. Let me tell you about just one, the example of Ginkaku-ji Temple in Kyoto. The temple itself is a core zone, and it should be untouched. And, the forest behind the temple is a buffer zone and it should be untouched, as well. If it is outside of the forest, the restrictions will not be applied to it, but recently, especially since the end of the last century and the beginning of the 21<sup>st</sup> century, UNESCO has become very strict with landscape preservation. There was once a plan to build a high-rise condominium outside of the forest behind Ginkaku-ji Temple and I received a letter from a citizen in Kyoto. If that building was constructed, it could be seen behind the forest at the back of the garden where the temple is located. That would be a problem. As a matter of form, the building will be built outside of the buffer zone, but it would still damage the landscape. So, I immediately called on the Japanese government to heed the matter. The government's reply was that the matter was in the jurisdiction of Kyoto city, and that negotiation should be made with the city, not the government." But, at the end of the day, Kyoto city made a move, and the height of the building was halved so that it would not be seen from Ginkaku-ji Temple.

As a matter of fact, there are many other similar examples. The Palace of Schonbrunn and the Historic Center of Vienna, Austria, are inscribed on the World Heritage Site list. There is a buffer zone around it. But, the plan to

construct a shopping mall with two high-rise towers was proposed and permitted by the city of Vienna. I said to the then Foreign Minister of Austria that UNESCO couldn't approve of it, and that if the shopping mall with two towers were built without any intervention of the Austrian government, they would surely damage the landscape of the Palace of Schonbrunn, and implied that UNESCO would take it seriously and could not help but consider delisting it. The reaction of the Foreign Minister was the same as that of the Japanese government in the case mentioned earlier. He said that it was under the jurisdiction of the city of Vienna, and that the Austria government had no authority. However, I did not back off and insisted that since this was a serious matter, they should talk to the city even if they did not have any authority. As a result, the Austrian government had a serious talk with the city, and the city intervened again, revoked the permission and gave an order to lower the towers. Then the matter was settled.

A regrettable case was that of Dresden Valley in the city of Dresden, Germany. It was inscribed on the list, applying a wider concept of a cultural landscape, like the Pilgrimage Routes in Yoshino and Kumano in Japan. Dresden was bombed out during WWII, but after the war, it was reconstructed in a very harmonious way. A few years ago, it was applied to the World Heritage Site as a cultural landscape, and the World Heritage Committee approved it. At the time of the inscription there was already a topic of concern. The west side of the city, which was the core, became too crowded with the influx of population, and the east side was developed. Between the two sides were two traditional bridges, which were reconstructed into their original appearance after being bombed during the war. These two bridges couldn't deal with the increase of the population, so a plan to construct an enormous modern bridge was proposed. However, it was a big problem from the viewpoint of UNESCO, because the bridge was expected to damage the landscape and was planned to be built in the very core zone, not in a buffer zone or outside of the buffer zone. Therefore UNESCO took it seriously, and issued a warning. The city of Dresden put it to a referendum to ask citizens whether they would agree or disagree to the construction of a third bridge. I mentioned at that time that it was a not an acceptable solution, because ordinary citizens, especially citizens on the east side would definitely think they needed a third bridge to solve the heavy traffic, and therefore agree to the proposal. However, an opposition campaign was waged, too, and the campaigners insisted that if the bridge was constructed, UNESCO would delist Dresden from the World Heritage Site list. But the bridge supporters didn't take it seriously, expecting that UNESCO wouldn't dare go so far. As a result, both the city assembly and the referendum approved the construction and they went ahead with it.

UNESCO could not possibly accept that and ordered to construct an underground tunnel instead. From the viewpoint of the city, UNESCO's order was outrageous. It would cost a fortune and take a long time to construct, and could not deal with the traffic congestion at hand. So, the city didn't accept the proposal and the construction of the third bridge actually started as planned. UNESCO decided to delist Dresden from the World Heritage Site in the World Heritage Committee. It caused repercussions not only among the citizens of Dresden, but also in other parts of Germany. One of them was criticism of UNESCO from supporters that it was excessive punishment. The other was a self-criticism that they were too optimistic and they should have taken UNESCO's proposal more seriously. But it was too belated. On the other hand, UNESCO hasn't shut the door completely about this matter, and is ready to give counsel in the future. Although Dresden was delisted, I think it was not a bad incident in the long run.

As I mentioned earlier, the inscription is a starting point from UNESCO's viewpoint. Going through the five stages is not an end in and of itself, for it is significant to also maintain the value of the site after that. The city of Dresden failed to do so, and the only punishment UNESCO could impose was to delist it, which was actually imposed. I have thought that this is a good warning to other World Heritage Sites. I strongly hope that this will never happen to other World Heritage Sites especially in Japan.

Well, I have talked about an hour. I will stop now and take questions from the floor, which I'd be happy to answer with detailed explanations. Thank you very much for your kind attention.

Question: I'm Kyoko Murakami from the Tateyama Sabo Salon. I'd appreciate it if you would give us some advice on what efforts we should make toward the inscription.

Matsuura:

I will reiterate that things went smoothly in the first stage, and you should aim to have the site on the tentative list. Governor Ishii is working very hard, but this matter concerns all the citizens of the prefecture. The important thing is how it should be promoted and how you can support the governor. There will be the 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> stages ahead, and there will be the 6<sup>th</sup> stage further on, and you will have to think about the post-inscription stage, too. What counts is credibility of the World Heritage Site list. Another important issue is the Global Strategy. There are two aspects to it. One of the strategies is the geographical expansion, which was launched in the 1990's, and it is achieving its purpose. Out of 187 countries which ratified the Convention, 36 countries do not have any World Heritage Sites, and 151 countries do. The locations should be expanded to the South Pacific, the Caribbean and to African countries. The other important point is diversity. The concept of the World Heritage Site was created in Western Europe, and many of the sites are religious sites dating back to the Middle to Modern ages. From the view point of human history, the World Heritage Sites should be expanded both geographically and temporally.

One example of contemporary sites is the Brazilian capital of Brasilia. After the war, a capital of Brasilia was constructed from scratch in the center of the nation by a famous architect, and the entire city became a World Heritage Site. These new sites are increasing one after another. In addition, not only religious sites but remains should be increased. So should mines, industrial facilities, and infrastructures. They should be increased even at a slow speed. In Japan, Shirakawa-go, the Historic Villages, the Atomic Bomb Dome, and the Iwami Ginzan Silver Mine have contributed to the diversity of the World Heritage Sites, but more efforts should be made. Many more industrial sites, infrastructure, mines, and modern and contemporary sites should be increased. In that sense, I think the Tateyama Sabo is a good approach. Globally there are probably no sabo facilities on the World Heritage Site list, and all that we have at present are infrastructure such as bridges, ancient water facilities from the Roman period, railroad systems, mines in the 19<sup>th</sup> and 20<sup>th</sup> centuries, and industrial facilities built during the Industrial Revolution. In Japan we have the Iwami Ginzan Silver Mine, but Japan lags behind other countries in terms of diversity of the World Heritage Sites. In that sense, too, I hope that you will make efforts to have the Tateyama Sabo inscribed. I would like you to discuss how citizens can cooperate toward the inscription in your salon, bearing in mind a few specific things I have mentioned to you today. I really wish the

success of the Tateyama Sabo. If it is successful, it will probably be Japan's and the world's first sabo to be inscribed on the World Heritage Site list. That will diversify the World Heritage Sites in Japan and in the world. There is a long way to go, from the 2<sup>nd</sup> stage to the 6<sup>th</sup> stage, and there will be many challenges ahead, but I do hope that they can be overcome with a lot of efforts from citizens.

## Sabo works for debris flow disaster reduction in the south American Andes

Prof. Julio Kuroiwa



Mina-sama Konnichi-wa.

Well, I'll try to be quick, because I have only ten minutes. And this is the title.

And I think Japan uses high Sabo Works technology. On the other hand, in South America, we need that, so it may help our region. For example, CAPRADE regional such organization so that Japan may provide our countries with technical assistance. Well, I don't repeat. Well, everybody knows, so I'm going to be quickly.

This is Tateyama. This is what you know very well. This is also. This is all well-known to you.

And in the Andes. That is mountain over 5,000 m high, close to the ocean, so that we have very steep river with the same characteristic of the Joganji River. And you see here the interaction of the South American Plate with the Nazca Plate forms the Andes and here with the Caribbean Plate forms the mountain in Venezuela. This is the way.

This is the main disaster of debris flow: Peru, 1987. Please pay attention. We are going to repeat. You see this disappeared here in Yungay. What happened with lahar flow in Columbia. What happened in Venezuela in 1999. A hydroelectric power plant destroyed in 1997.

And also here, a large flow in Cuzco. I'm going to pass quickly the next view, because we'll repeat this. See this type of top. Large rocks destroyed completely. This is the very high hazard. However I'm going to show that all these have been occupied now with people.

It is the city that disappeared completely: Yungay, 1995. We took these pictures 25 years after the disaster. This is Columbia, well-known. It happened in Venezuela.

I flew over this area in 2007.

and made land inspection in that location. This is the Sabo in Venezuela. You may know the slit type of Sabo. This view from the air.

This is in Cuzco. You see this dam similar to the Joganji River. This picture was taken this year. It means that climate change will really increase intensity and frequency. Well, I'm taking surveys: JICA Master Plan for the Rimac River. Why? Because it's very important for Peru. Lima, Peru's capital city, where nearly nine million people live. What reasons are there? I'm not going to read.

The view from west to east. North here. Mountain from here to here. Only one hundred kilometers. Five thousand meters here. So the situation of the Rimac River basin is not so much different from the Joganji river.

About 20 years ago, JICA prepared the Master Plan for the Rimac River. At that time, the 80's were considered the lost decade for most of the Latin American countries.

The situation has improved a little bit. And the Peruvian government has considered the disaster reduction was its main policies. I think it advance. It created the National water Authority and also that year, the Ministry of the Environment. I think they might do something.

This is the Rimac River here. The JICA Master Plan covered from here to here. This is the location of Peru. This large area is the middle reaches of the Rimac River. You see the detail. Two rivers join here. Chosica. And you're going to see why. This is the hazard map of 1987.

Look why. Now two-or-three-meter canal only remains here. So all these people are at high risk. Maybe we need some Sabo on the upper part. So they are some specific examples where people far from Japan, far from Toyama, may benefit from this.

This picture was taken about two weeks ago. You see the hazard area is full of people. Large rocks are here. Look at this. They expect the whole volume coming from the mountain may pass if there are more canals.

Well, this organization will be in charge of this and the economy has improved, so it may possible to do some hardware ways ourselves.

I think this is the most important thing. I'm going to read. The Japanese government has trained me for 50 years. First OTCA and now JICA. Through Oi-san, I want to thank the Japanese government. To the Public Works Department of Toyama Prefectural Government for its invitation to be a

guest speaker at the International Sabo Forum 2010. To the Ministry of Construction, formerly, in charge of the International Institute of Seismology and Engineering, where I studied in 1961-62 and again 1975 and 76.

Thank you very much.

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## SABO WORKS FOR DEBRIS FLOW DISASTER REDUCTION IN THE SOUTH AMERICAN ANDES

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1

1

## AN OVERVIEW

- Japan has developed high Sabo Works technology and it is being introduced in different countries worldwide.
- In the South American Andean Sub-region Countries (SAASC) sediment-related hazards are intense and frequent, because of the high Andes Mountain Range and intense rainfall. Because of the Earth's global warming, these disasters will increase in frequency and intensity.
- By matching the availability of technology with the need, it may be possible that a Regional Disaster Reduction Organization such as CAPRADE; JAPAN, could provide the SAASC with technical assistance on Sabo Works.

2

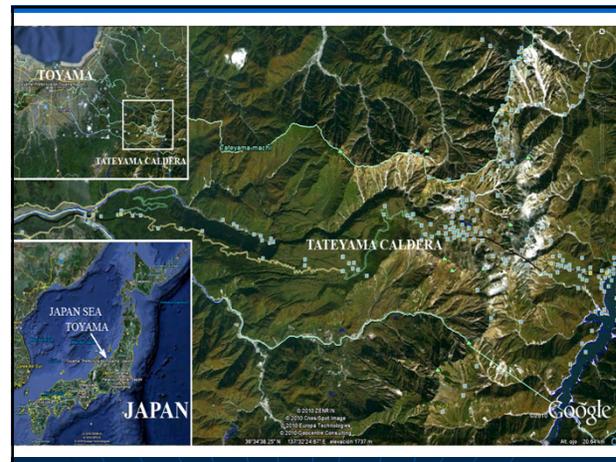
2

## SABO WORKS DEVELOPMENT IN JAPAN

- It was initiated at Toyama Prefecture (TP) about a century ago.
- Because of TP's very hazardous scenario threatened by debris-flow disasters –worse than in other prefectures –such as the steep Joganji river and huge volume of debris at the Toyama Caldera, the TP needed creative and hard work to develop outstanding Sabo Works technology.
- TP wished to share this knowledge and experience with other countries, as it is doing at present.
- Maybe the best way to recognize such efforts and share their results, is to consider the Joganji river basin as a World Cultural Heritage site.

3

3



4

## SABO WORKS IN TOYAMA PREFECTURE, JAPAN

Continuously collapsing of Mt. Tombi

Estimated flooding of 1858

Shiraiwa Sabo Dam

Upper reaches of Joganji River and its tributaries

5

5



6

### JAPAN'S CENTRAL GOVERNMENT ORGANIZATION FOR EROSION AND SEDIMENT CONTROL

- In Japan there are 47 prefectures and in each one, there are two official entities:
- The Erosion Department of the Ministry of Land Infrastructures and Transport (MLIT), responsible for erosion and sediment control in rivers.
- The Forestry Agency of the Ministry of Agriculture Forestry and Fisheries, in charge of erosion control to conserve forest land.

7

### SEDIMENT HAZARDS IN THE SOUTH AMERICAN ANDEAN SUB-REGION

- Sediment-related hazards are common in the Andes high mountains (over 5000 m), where there is heavy rainfall and rivers at their upper reaches with steep gradient, fast-moving water, and great erosive power.
- These physical characteristics have caused very destructive disasters as shown in the next slide.
- Because of global warming, those disasters are going to be more frequent and intense.
- For their adaptation to climate change, SA countries need to be protected from hydrological disasters.

8

• Mountain ranges products of the interaction of South American plate with Nazca plate at its western border, and with the Caribbean plate at its northern boundary.

• Section of Nazca & South American plates with over 5000 m high mountain.

**CORTE A-A**

9

### DEBRIS FLOW DISASTERS IN SOUTH AMERICA 1970 - 2010

LOCATION MAP

c ARMERO COLOMBIA, 1985     
 d LARA STATE VENEZUELA, 1999  
b ANCASH PERU, 1970     
 e MACHU PICCHU PERU, 1997  
a EL PEDREGAL PERU, 1987     
 f CUZCO PERU, 2010

10

### a EL PEDREGAL PERU, 1987

ALTO  
MODERADO  
BAJO

11

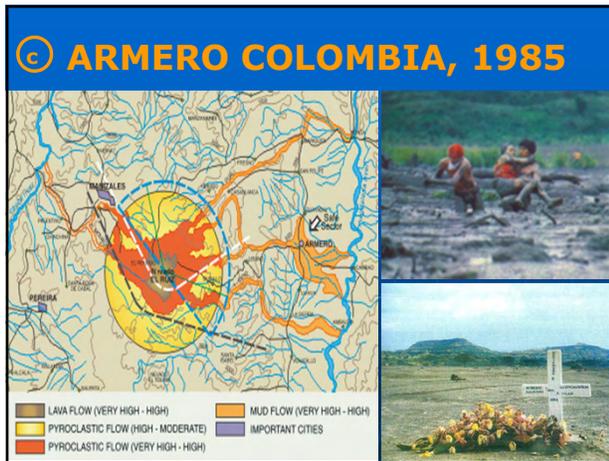
### b ANCASH PERU, 1970

Yungay, 1995

Ranrahirca, 1995

**ALUD 31 MAYO 1970**

12



13



14



15



16



17



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### A PRACTICAL CASE THE RIMAC RIVER BASIN (RRB)

The RRB plays a crucial role in the life of Lima, Peru's capital city with nearly 9 million inhabitants, because:

- The RRB provides drinking water as well as water for industrial mining and agricultural uses, and for hydroelectric power generation.
- The Central Highway and the Central Railway of Peru connect Lima with vast regions of the Andes highlands and the Amazon jungle, with an increasingly voluminous interchange of goods.
- Any natural or man-made disaster may affect half of the country's 28 million inhabitants.

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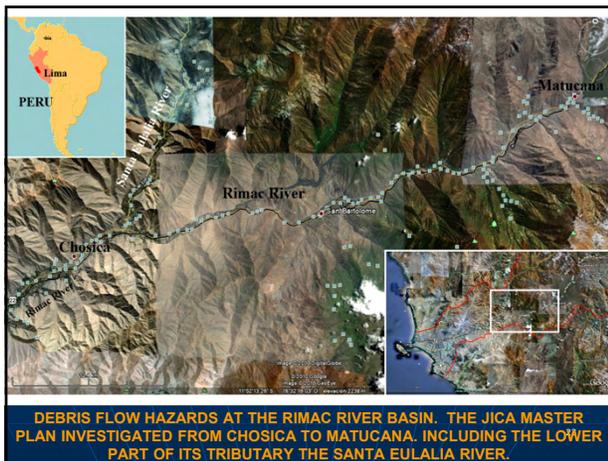


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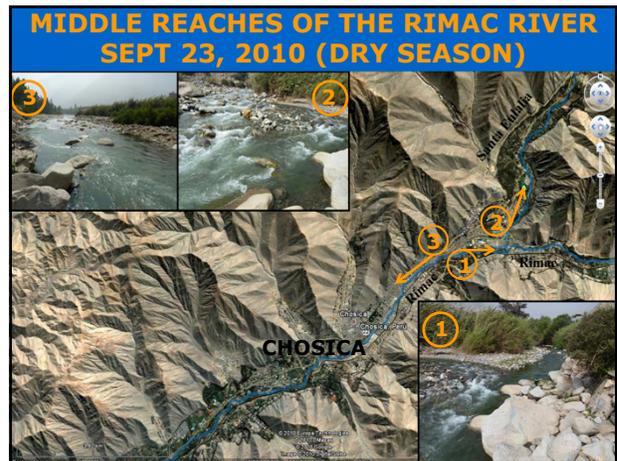
### THE JICA MASTER PLAN (JMP)

- The JMP is based on the premise that disaster may be effectively reduced by the integral management of water run-off throughout the basin.
- However, some very critical structural measures may be implemented, such as a Sabo works dam in the Chosica area as soon as possible.
- Non-structural measures, which are not so costly, may be implemented in the RRB.
- In 2009 the Peruvian Government created the National Water Authority (ANA) and the Ministry of the Environment, in charge of water management, including disaster reduction and controlling the depredation of trees on steep hills.

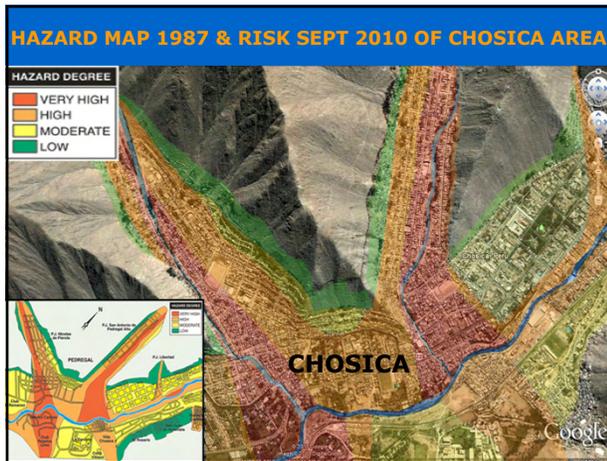
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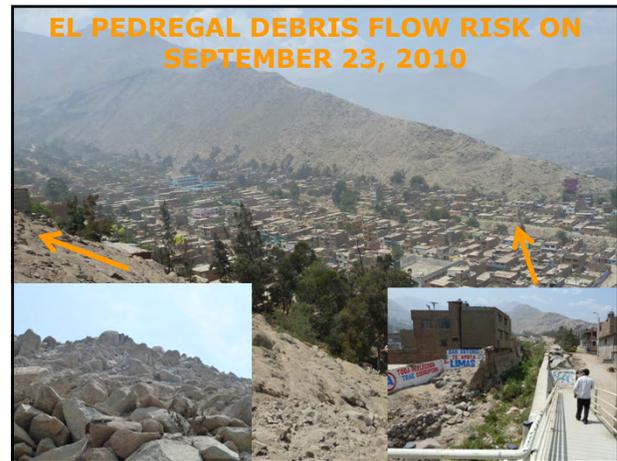
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- CAPRADE is the Spanish acronym for the Andean Committee for the Prevention of and Attention to Disasters. According to its mandate from the country members -- Colombia, Ecuador, Peru and Bolivia--, it may coordinate foreign technical assistance on the matter, including Sabo Works.
- In Peru, currently in a better economic situation than in 1988 when the JICA Master Plan for the Rímac river basin was concluded, it may now be possible to implement some high priority hardware measures, such as building a steel pipe open type Sabo dam in Pedregal.

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- ## ACKNOWLEDGEMENTS
- To the Japanese Government (OTCA and JICA) who trained the author for 50 years.
  - To the Public Works Department of Toyama Prefectural Government, for its invitation to be a guest speaker at the International Sabo Forum 2010.
  - To MLIT, formerly the Ministry of Construction, in charge of the IISEE where he studied in 1961-62 and 1975-76.

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## Sabo works and hazard mitigation

: the case of alluvial event of August 2003

in the Carnian Alps (north-eastern Italy)



Dr. Alessandro Pasuto

Konnichiwa and thank you very much for inviting me as a guest speaker here today.

I would like to show you some examples of sabo works in Italy, but before that, I would like to give you an overview of the situation in Italy and more in general in the Alps, in relation with hydrological risks and sabo works. Hydrological risk in Italy is a great problem. Since 1950, we have more than 6,000 victims. You can see on the right side, these red dots show locations in which landslides and floods occurred, causing victims. Here is a list of some of the most important catastrophes we have suffered in the last 60 years, starting from the big flood in the Po Delta plain in the northern part of Italy, then passing through Vajont landslide that caused almost 2,000 victims, and a Venice alluvial event.

Anyway let me show you some of the images. This is the Vajont landslide. It is quite famous all over the world. Almost 260 million cubic meters fell down into the reservoir and water-waves jumping on the dam, causing the destruction of seven villages. Here on the upper part, left side, you can see the village of Longalone before and on the right side after the event. Here are some images of flood events in Florence, which pointed out the problem we have in Italy. We have great cultural heritage. Here below on the right side, you can see the cross of Cimabue, which was seriously damaged. I would like to remind you that almost 70% of the art masterpieces are in Italy. So we are more vulnerable, just for this reason.

This is one of the more recent catastrophes we suffered in the southern part of Italy. Some mud flows fell down after a long period of rainfall and destroyed some villages. This is important even because it represents the turning point in Italian legislation. After this event, the Italian government took a lot of laws in order to provide all the municipalities with civil defense plans.

The point I would like to stress is we have to break the link between hazard and disaster, because the hazard is inevitable. Landslides and earthquakes

always occur as long as we live, but disasters are not inevitable. We have to prevent. The definition of prevention is the action of stopping something from happening or arising. So we have to act in order to prevent. Please look at the risk equation that shows the relation between risk, hazard and vulnerability. If we want to reduce risk, we can reduce vulnerability, mainly by non-structural measures like increased public awareness, civil defense plan and so on. Or we could reduce hazard by mainly structural mitigation measures such as sabo works.

Here are some examples of sabo works in Italy. We have a long tradition. You can see a design in 1848, and some other examples, this is a great check dam during the flood event in 1966. An open check dam. This is one of the last realizations of trap basin for a debris flow fan.

So let me introduce the event that struck the north-eastern part of Italy, close to the boundaries with Austria and Slovenia. On 29th of August, 2003, heavy rainfalls occurred. Here are some rainfall heights. You can see that some rain gauges registered almost 400 mm in one day. Please keep in mind that this is one of the rainiest areas in Italy with the average yearly rainfall of more or less 2,005 mm. So in one day we have almost 400 mm. Here are hydrological data of some hydrometers along the main river. This river and valley, I mean, Treviso Valley, is very strategic for Italy because it is one of the two passes that connect Italy with the northern part of Europe. You can see rapid increasing of the water level within the river and so this means the intensity of rainfall. After the event we mapped all the landslides occurred. We mapped more or less more than 1,000 landslides and debris flows. Here are effects of the event due to floods. Or to erosion at the base of the house, which fell down into the river. Here is a debris flow that covers completely some villages. Also some flood events that affect houses, roads and also properties.

This is why the governments, local and also central, fund more than 20 projects in order to repair and put people in safer condition. Here are some examples of villages in Valbruna's debris flows. Here are sabo works that are carried out in more or less two years, one and half years.

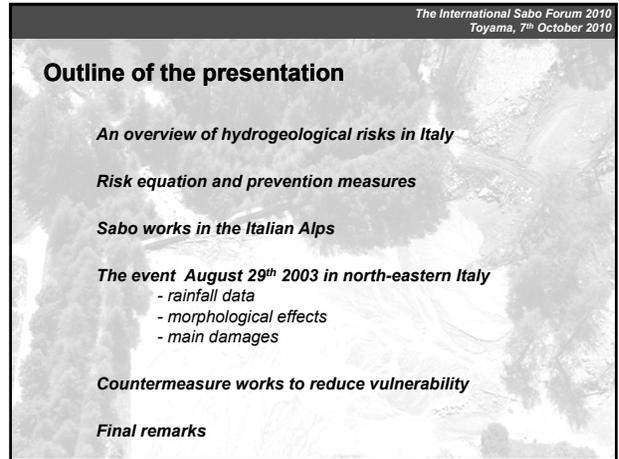
Here are some other kinds of sabo dams. You can see here on the right side, lower part, a trap basin in order to store and collect debris coming down the channels. Other kinds of open check dams just to block the debris coming down. This Rio degli Uccelli increased the level of the bed, almost 10 meters during the event. So they built an open check dam. And here is the final realization. Alluvial fan that struck the village of Ugovissa, on the right side,

you can see the river works that have been carried out.

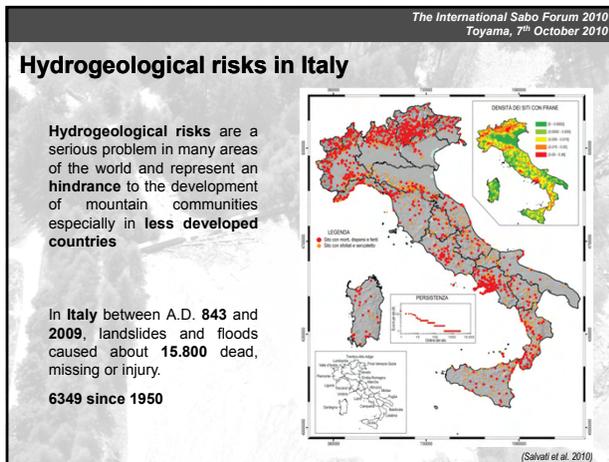
Let me take the conclusion. In my experience in the Alps, sabo works are a powerful tool to mitigate hydrological risks, but they are very expensive. The problem is to find out such a fund. They have the impact on the territory. There are now methods to mitigate this impact. And they are not always effective if they are not correctly maintained. Therefore we have some needs in order to make a jump over. We need an in-depth investigation to optimize the economic investment. We need an accurate environmental impact assessment to minimize the impact of the works. We strengthen the use of innovative sabo technique such as soil cement at a check dam, bioengineering in hillside works. That should be widely transferred. I know that Japan all the years has transferred such techniques to the third countries and developing countries. This could be useful to improve their resilience in relation to sediment-related disasters. The last but not least is to organize maintenance plan to preserve the effectiveness of check dams of the sabo works. Otherwise, they will lose the efficiency. Arigatogozaimashita.



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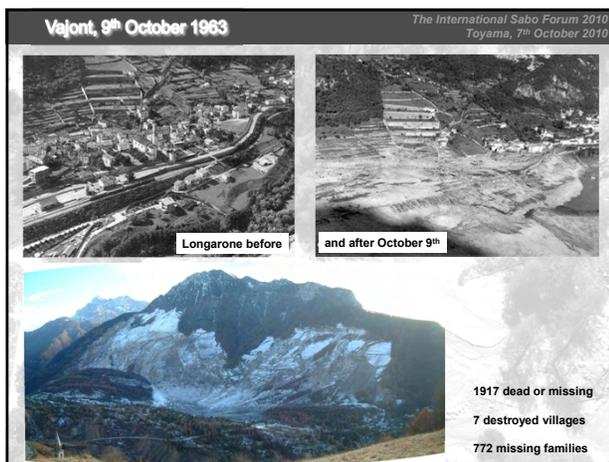
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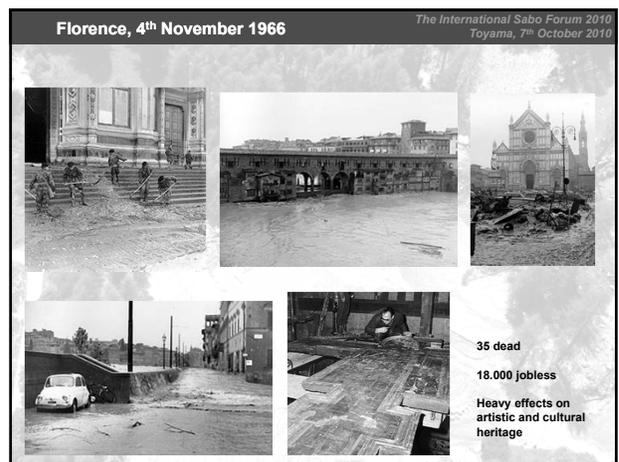
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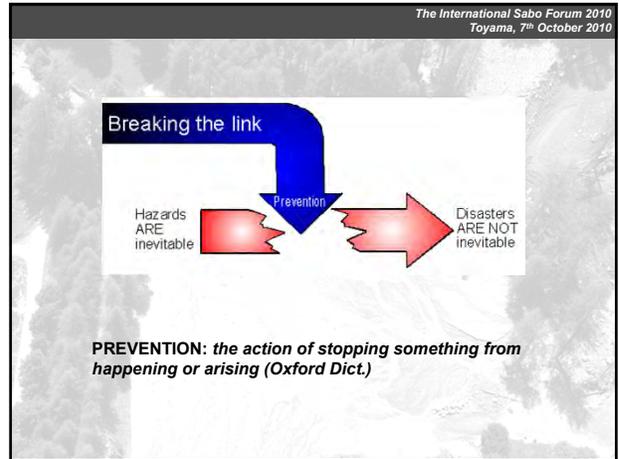
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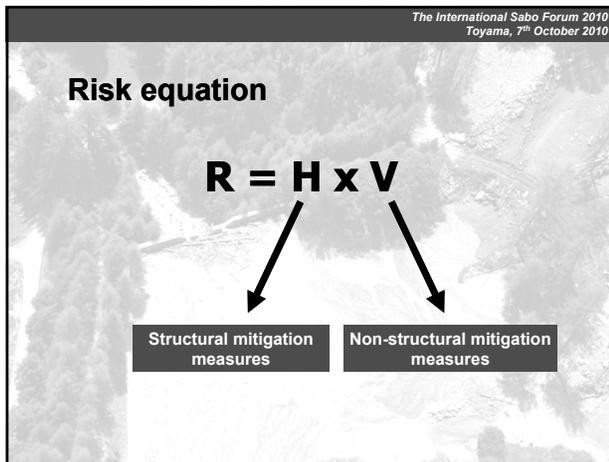
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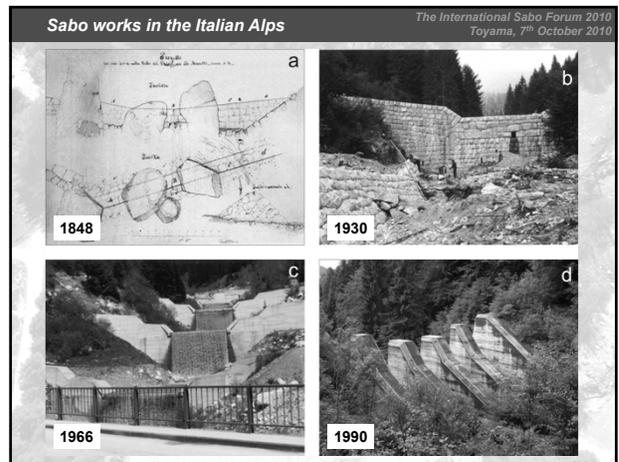
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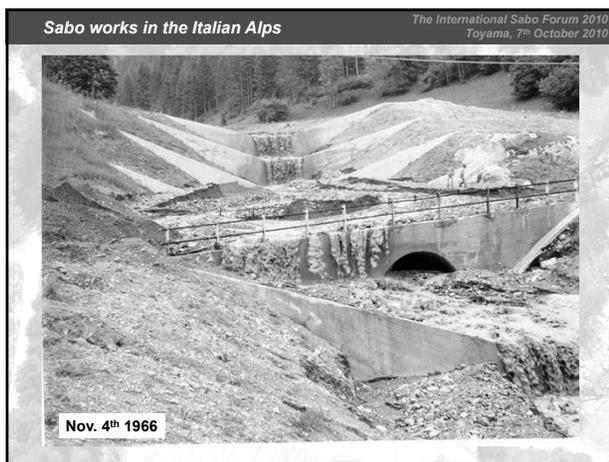
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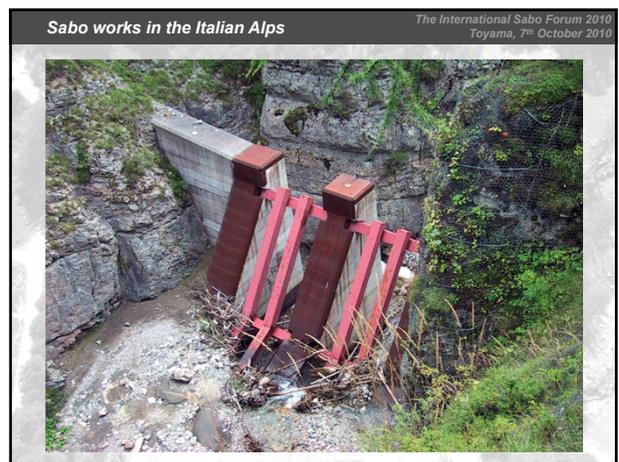
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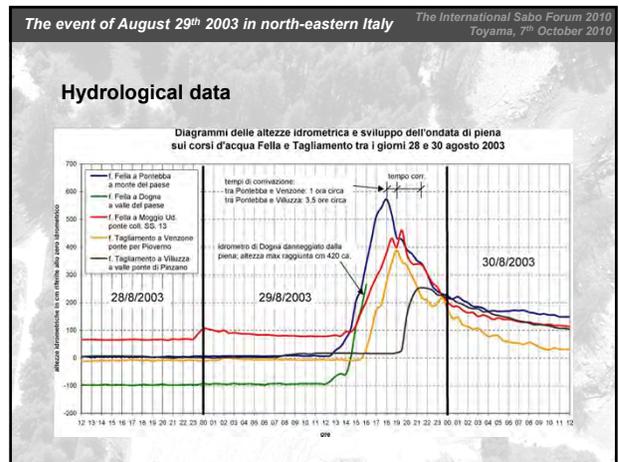
The International Sabo Forum 2010  
Toyama, 7<sup>th</sup> October 2010

The event of August 29<sup>th</sup> 2003 in north-eastern Italy

Rainfall data

Rain Gauges	Aug. 29 <sup>th</sup> mm	Aug. 30 <sup>th</sup> mm	Aug 31 <sup>st</sup> mm
Tarvisio Predil	141,6	13,4	83,4
Tarvisio	117,2	1,6	74
Pontebba Pramollo	334,8	0,8	54
Pontebba	396,2	1,8	60,6
Chiusaforte	74,4	36,6	34,2
Chiusaforte Saletto	65,4	32,8	62,4
Moggio Udinese	136,8	21,2	48,6

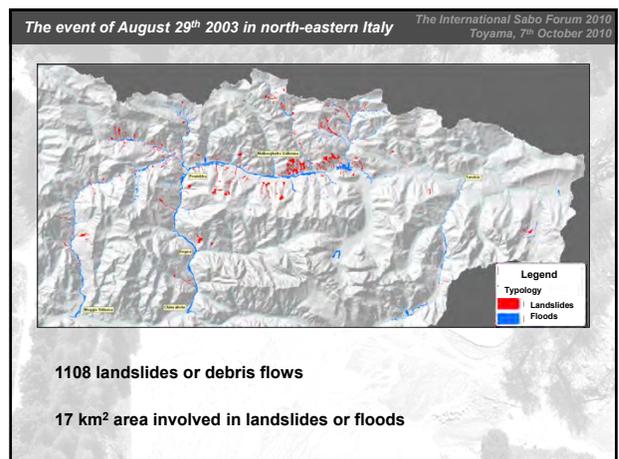
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The International Sabo Forum 2010  
Toyama, 7<sup>th</sup> October 2010

### Final remarks

Sabo works are powerful tools to **mitigate hydrogeological risks**

**BUT.....**

- very expensive
- high impact on the territory
- not always effective if no correctly maintained

**THEREFORE**

- In-depth investigation to optimize the economic investment
- Accurate **Environmental Impact Assessment** to minimize their impact
- strengthen the use of **innovative Sabo techniques**, such as soil cemented check dams and bio-engineering hill-side works should be widely transferred especially in the developing countries in order to improve their resilience to sediment-related disasters.
- well-organized **maintenance** plan to preserve their effectiveness

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The International Sabo Forum 2010  
Toyama, 7<sup>th</sup> October 2010

ありがとうございます。

[alessandro.pasuto@cnr.it](mailto:alessandro.pasuto@cnr.it)

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## Global trend of disaster reduction and contribution of Japan's Sabo

Mr. Hidetoshi Oi



As mentioned earlier in the governor's address and in the discussion with Mr. Matsuura, in order to move on to the 2<sup>nd</sup> and up to the 5<sup>th</sup> stage, as prerequisites, Japan's sabo technologies need to be spread worldwide, and, as is obvious, the significance of sabo facilities with the Shiraiwa Sabo Dam as its core need to be widely recognized.

In my presentation I would like to relate to you how the recognition of Japan's sabo and sabo in general, can make a breakthrough and achieve wider recognition than it presently has.

Because of time constraints I may have to cut my presentation short, so I will first tell you my conclusions. This picture shows a kind of dream that I have. I made some alterations on a picture taken at the International Conference held in Geneva in 2007. Every year international conferences are held, and the next big conference where heads of state and global leaders will convene will probably be held in 2015. It is my hope, and probably yours too, that the term "sabo" will be used in these international conferences. Although the term is recognized internationally and its significance is repeatedly discussed by sabo experts such as ourselves, the term "sabo" is hardly used in major conferences.

The term "tsunami" has been well established due to the major earthquake and tsunami that occurred off the coast of Indonesia in 2005, just before the World Conference on Disaster Reduction held in Kobe. Since then, the term tsunami has been frequently used in international conferences. In comparison, "sabo" has not yet been in the limelight. However, I hope that this campaign for the inscription of the Tateyama Sabo on the World Heritage Site will lead to a full recognition of "sabo" and with our ongoing efforts, before the year 2015, it will be recognized and featured more than the terms "earthquake" and "tsunami". I also strongly hope that on that same occasion the inscription of the Tateyama Sabo will be announced by the representative of the Japanese government.

Well, bearing these ideas in mind, I would like to give a presentation in the following order. First, disaster occurrence in the world. Secondly, the history of international cooperation for disaster reduction, not limited to sabo. Followed

by Japan's international cooperation in the field of sabo. Finally, I would like to talk about the world strategy for disaster reduction and the contribution of Japan's sabo.

This graph shows the natural disaster occurrence throughout the world. This is the reported number. Over the past 20 to 30 years, it has increased sharply.

This graph shows natural disasters by types. "Hydrometeorological" disasters include wind and flood damage and sediment-related disasters. "Geological" refers to earthquakes and volcanic eruptions. "Biological" refers to epidemics and the like. You can see that "hydrometeorological" disasters and floods are on a sharp rise. That is characteristic of these types of natural disasters. Among these, "slides" include debris flows. From this graph, "floods," and "storms," or hurricanes and typhoons are overwhelmingly large in number, and the others are more or less the same in number.

Two important facts can be pointed out from these 3 graphs. One is the increase in hydrometeorological disasters. The trend will increase more in the future in accordance with climate change. The other factor concerns slides. This category includes debris flows, and slides coincide with floods or hurricanes. Therefore, even when slides or debris flows occur, they are statistically registered as flood disaster or hurricanes, resulting in the small number of slides. I would like people in the world to know that it is wrong to think that slides are not a major disaster, because of its statistical number, but that the real number is much larger than reported. Extreme weather, or slides or debris flows caused by extreme precipitation will surely increase in the future. Therefore the world should recognize that the actual number far exceeds the reported number, and that it is going to increase more in the future.

This is the overview of international cooperation for disaster reduction both in English and in Japanese. The major events are shown in red. In 1990, the International Decade for Natural Disaster Reduction was declared, and international conferences were held in Yokohama and Kagoshima. In 1994, as a mid-term review, the World Conference on Disaster Reduction was held in Yokohama. And as a review of the decade, as you are aware, the World Conference on Disaster Reduction was recently held in Kobe. Currently in 2010, the mid-term review for the decade covering 2005 to 2015 is being conducted. The result will be reported in the U.N. General Assembly next year. Furthermore, the review of the decade covering 2005 to 2015 will be conducted in 2015, which will be also reported to the U.N. This is how the global disaster reduction is proceeding. Therefore, I think that by making efforts in conformity

with these global trends, the term “sabo” will be recognized worldwide, and its significance will be understood.

In the above mentioned World Conference on Disaster Reduction in Kobe, the Hyogo Framework of Action was adopted. Five Priorities of Action will be discussed further in cooperation with the government. The five Priorities are shown in the chart. Each government is engaged in activities in accordance with a guideline. JICA also employs this framework. I'll not go into any details, for now.

So far I have explained the global movement. This lists Japan's cooperation in the field of sabo. One of them is the various kinds of conferences hosted mainly by MILT, the Japan Sabo Association, and the Sabo Technical Center. In addition, support for developing countries by JICA, ICHARM, and ICL (International Consortium on Landslides), with which Mr. Matsuura advised us to cooperate.

Next is a list of JICA's projects—sabo-specific projects and comprehensive projects whose main component is sabo. The dispatch of experts to Volcan Irazu in Costa Rica in 1966 is the oldest found in my research. And Mr. Yokota, who was sent to Indonesia, was the first long-term expert dispatched to Asia. Recently the number of projects related to disaster reduction has been increasing greatly. Here, the countries where JICA cooperates in sabo are plotted on the map. One country is plotted as a circle. So, although Indonesia, the Philippines, and Nepal are plotted as a single circle, the actual number of projects is much larger. Blue circles show MILT-based bilateral cooperation and bilateral technical meetings are held between Italy, South Korea, China, and Taiwan.

Currently, a review of disaster reduction to date is being conducted. This shows the possible themes of global cooperation, which I outlined from the result of recent discussions. The final result will be released around December. I'm not sure to what extent my summary will be congruent with it, though. Anyway, these are the issues that are currently being discussed.

One of them is the expansion of community based disaster management. Another is risk mapping and other soft approaches. Japan has a lot of technologies in these fields, and we'd like to disseminate them. Then, networking for knowledge sharing is another big theme. The secretariat of International Sabo Network is in the Japan Sabo Association. ISN is implemented mainly by the International Sabo Association, and incidentally

today they are holding a meeting in Washington to discuss how to expand ISN. Japan's International Sabo Network is being introduced there. Furthermore, disaster prevention of mega-cities, and climate change adaptation, and increase in budget to move things forward. These are major issues being currently discussed.

The time is almost up, but I want to show pictures of disaster prevention on slopes in mega-cities. There are many places like these in the world, and the zoning of disaster prevention, I think, will be one of the themes of overseas cooperation. Appropriate technology, the development of inexpensive and effective construction methods will then be useful in developing countries.

In the future, disasters caused by "guerrilla rain" will increase. They cannot possibly be covered by the national network, so community based disaster management will be required. For instance, there was a landslide in Leyte, Philippines, in 2006. There are three observation stations in Leyte Island. Such extreme precipitation differs from valley to valley, and should be monitored in each valley. By showing the divergence in precipitation between existing observation stations and within each valley, it can be proved that an observation station should be made in each valley where there is a risk of landslide.

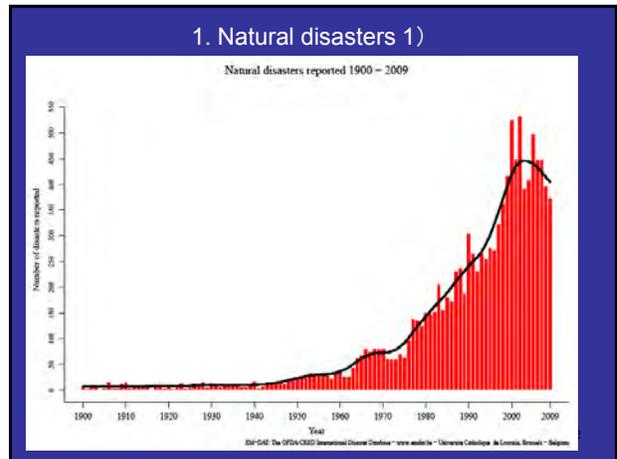
These will be focal points of global discussions in the future. Therefore, if sabo focuses on these points, sabo will be seriously discussed in international conferences on disaster reduction, and the word "sabo" will be established. That is my hope.

## Global trend of disaster reduction and contribution of Japan's sabo

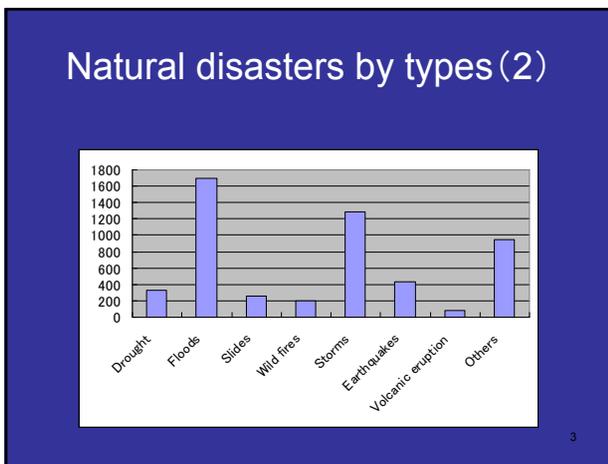
1. Disaster occurrence in the world
2. International cooperation for disaster reduction
3. Japan's international cooperation in the field of sabo
4. World strategy for disaster reduction and contribution of Japan's sabo

Hidetomi Omi October 7, 2010 1

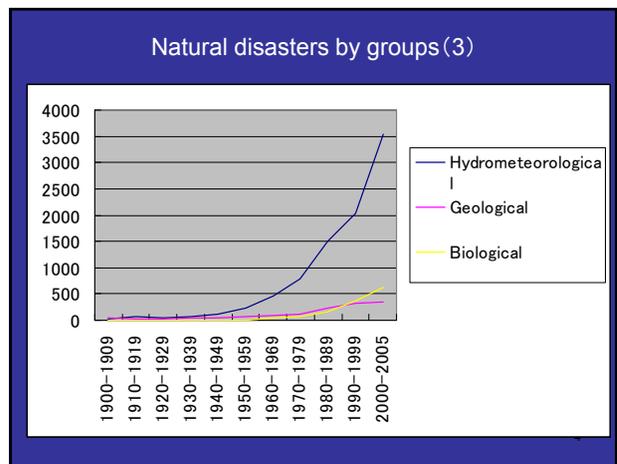
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### Overview of international cooperation for Disaster Reduction

1971	UNDRO
<b>1990-1999 International Decade for Natural Disaster reduction (IDNDR)</b>	
1990	IDNDR Conference (Yokohama)
1991	World Conference on Disaster Reduction (Yokohama)
<b>2000-2015 International Strategy for Disaster reduction (ISDR)</b>	
2001	Inauguration of ISDR
2002	World Summit (Johannesburg)
2003	3rd World Water Forum (Kyoto)
2005	World Conference on Disaster Reduction (Kobe)
2006	World Bank Global Facility for Disaster Reduction and Recovery (GFDRR)
2010	Mid-term review of Hyogo Framework of Action (HFA)
2015	Final review of HFA to be reported to UN Sustainable Development Committee 2015

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### Table 1 Historical overview of international cooperation for disaster reduction

International organisations	Japan
1953-1990 World Bank Loan, 1954-1977 War compensation	
	1954-John Colombo Plan
	1958 Start of Yushu-kan, 1969 Start of Grant-aid
	1961 OECD, 1962 OPEC, 1963 AFCA, 1974 AICA
1971 UNDRO	1982 Emergency Medical Team, 1987 Emergency Relief Team
<b>1990~1999 International Decade for Natural Disaster Reduction (IDNDR) : First international cooperation for disaster risk reduction</b>	
1990 IDNDR Conference (Yokohama)	Emphasis : From reactive relief to proactive prevention applying science and technology
1994 World Conference on Disaster Reduction (Yokohama)	Reviewing achievement during first half of IDNDR, adopted Yokohama Strategy for the second half 1998 ADRR
<b>2000~2015 International Strategy for Disaster Reduction (ISDR) : International programme for follow up of IDNDR</b>	
2001 Inauguration of ISDR Secretariat	Role: To follow up IDNDR for promotion of disaster reduction world wide
2002 World Summit (Johannesburg)	"Disaster" was recognized as a menace to human being ranked among conflict, AIDS etc for the first time at high level meeting
2003 3rd World Water Forum (Kyoto)	Disaster reduction was discussed for the first time. ISN and others were proposed and supported.
2005 World Conference on Disaster Reduction (Kobe)	Reviewing implementation of Yokohama Strategy, adopted Hyogo Framework of Action (HFA)
International Recovery Platform (IRP)	Role: To promote activities under HFA 4 for Recovery
2006 WB GFDRR	Membership of WB supported by 10 donors including Japan. It plays leading role for disaster reduction together with UNDRR.
2006 ICHAAM	
2010 Mid-term review of HFA	To review achievement during 2005-2010 and prepare plan for 2010-2015. Result will be reported to UN General Assembly in 2011
2015 Final review of HFA	Result will be reported to UN Sustainable Development Committee

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Hyogo Framework of Action	
Priority for action	Key activities
1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation	<ul style="list-style-type: none"> <li>Legal, institutional enhancement</li> <li>Staffing and budgeting</li> <li>Community participation</li> </ul>
2. Identify, assess and monitor disaster & enhance early warning	<ul style="list-style-type: none"> <li>Risk mapping</li> <li>Early warning</li> </ul>
3. Use knowledge information and education to build a culture of safety and resilience	<ul style="list-style-type: none"> <li>Networking for information and experiences</li> <li>Technology development</li> </ul>
4. Reduce the underlying risk factors	<ul style="list-style-type: none"> <li>Land-use planning ·Poverty alleviation</li> <li>Building Code</li> <li>Environment preservation</li> </ul>
5. Strengthen disaster preparedness for effective response at all levels	<ul style="list-style-type: none"> <li>Strengthening risk management</li> <li>Emergency plan and drill</li> <li>Promotion of volunteer activities</li> </ul>

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3. Japan's cooperation in the field of sabo	
MLIT/ Japan Sabo Association/Sabo Technical Center	<ul style="list-style-type: none"> <li>Bilateral conference, joint research etc ( China, Italy, Taiwan, South Korea)</li> <li>International Sabo Network</li> <li>INTERPREVENT</li> <li>Typhoon Committee</li> </ul>
JICA	Support for developing countries (See attached chart)
ICHARM	Research, training and information networking for prevention of water-related disasters (2006-)
ICL	International consortium to promote activities for landslides risk reduction through multidisciplinary approach (2002-)
EWB	Technical assistance in reconstruction after disasters (2006-)

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JICA 's main projects in the field of sabo (1)		
↑Sabo-specific projects and comprehensive projects whose main component is sabo		
1966	Costa Rica	Volcan Irazu sabo project (expert)
1970-現在	Indonesia	Long-term dispatch of experts
1977	Nepal	Long-term dispatch of experts
1977-1982	Indonesia	Merapi volcano/Semeru volcano (study/yen loan)
1982-2006	Indonesia	Volcano sabo technical center/sabo technical center/ comprehensive disaster reduction in volcanic area (TCP)
Etc. 1987-1989	Indonesia	Gulunggung volcano (study, grant-aid)
1987	Peru	Rio Rimac disaster reduction (study)
1988	Venezuela	Rio Chama disaster reduction (study)
1989-1994	China	Loess Plateau erosion control technology training (TCP)
1990, 1996	Nepal	Kulekhani disaster reduction (yen loan)
1990	Mauritius	Port Louis landslide prevention (study)
1990	Brazil	Reconstruction after disaster in coast mountains in Cubatao (study)
1991	Philippines	Mt. Pinatubo (grant-aid)
1991	Indonesia	Emergency disaster relief in Mount Kelut (yen loan)
1991-2004	Nepal	Flood control sabo center, natural disaster reduction support (TCP)

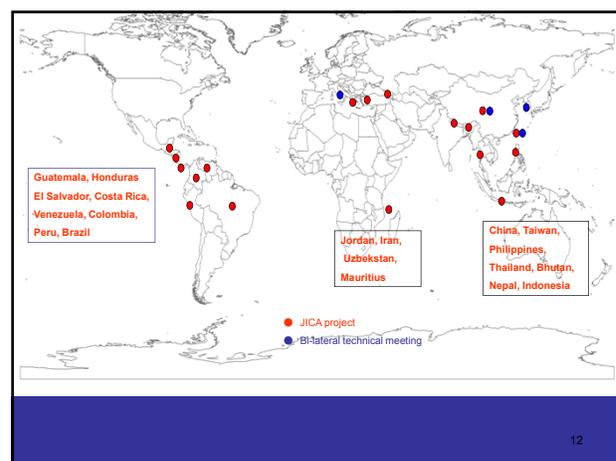
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JICA's main projects in the field of sabo (2)		
1995-2003	Philippines	Mount Pinatubo (study, grant-aid, yen-loan)
1993	Honduras	Chamelecon River flood control (study, grant-aid, yen-loan)
1996, 2003	Philippines	Mt. Pinatubo (study)
1997	Honduras	Choroma River flood control & sabo (grant-aid)
1997	Nepal	Disaster prevention plan for 1993-disaster-stricken area (study)
1997	Nepal	Basin management in western mountainous area (study)
1998-2001	Indonesia	Sulawesi Seltan erosion control plan (TCP)
2000	Philippines	Comprehensive disaster reduction in Mayon Volcano (study)
2000	China	Forestation in Loess Plateau, anti-desertification in Gansu Province, and Shingang Uyghur Autonomous Region
2002	Honduras	Landslide prevention in capital region (study)
2002	Iran	Karoon River basin management (study)
2002	China	Sediment-related disaster prevention for Xiaojiang River, Yunnan Province (study)
2005	Venezuela	Disaster prevention basic plan for Caracas (study)
2006	Colombia	Landslide /flood monitoring/early warning (study)
2006-2010	Jordan	Sabo for arid area (TCP)
2007	Nepal	Disaster prevention for Narayanghat-Muglin road (study)
2007-2010	Uzbekistan	Landslide monitoring technology improvement (TCP)
2008-2011	Indonesia	Banjir-Bandang disaster prevention (TCP)

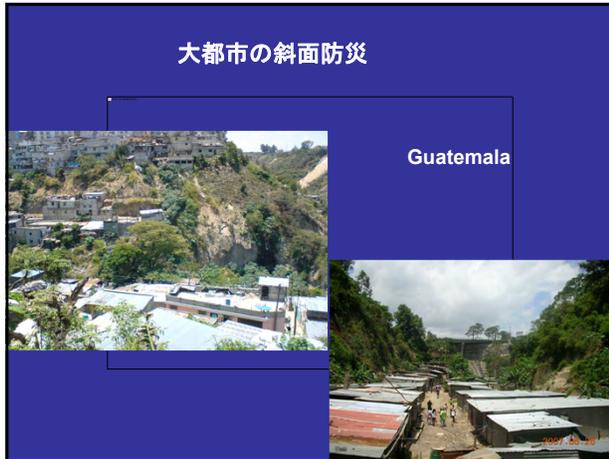
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4. World strategy for disaster reduction and contribution of Japan's Sabo	
World strategy under consideration for finalization in early 2011	Contribution of Japan's Sabo in support of the strategy
Community based disaster management	Development of appropriate technologies
Risk mapping and other soft approaches	Introduction of approaches in Japan esp. risk mapping and land-use regulation
Networking for knowledge sharing	Expansion of International Sabo Network (ISN)
Disaster prevention of mega-cities	Disaster prevention of densely populated slopes around mega-cities
Climate change adaptation	Development of method for monitoring, prediction and warning of sediment disasters by extreme precipitation
Increase in budget by convincing financial authority of effectiveness of disaster reduction projects	Development of cost-benefit analysis for common application to developing countries

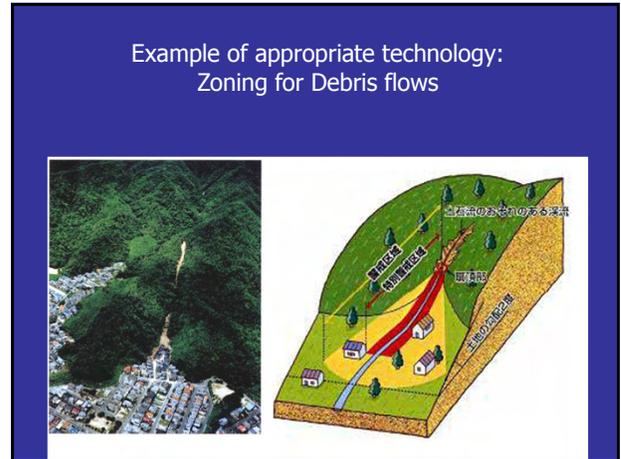
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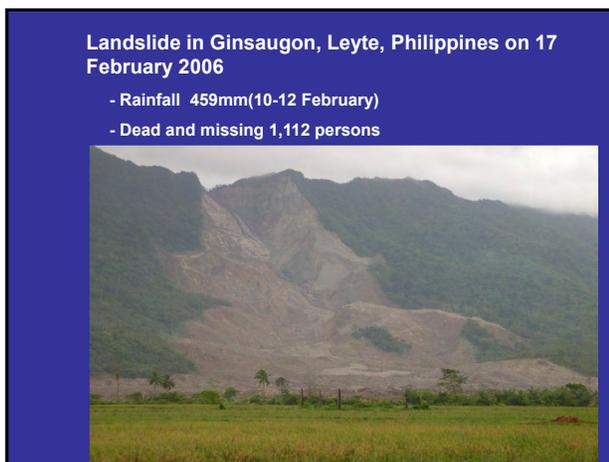
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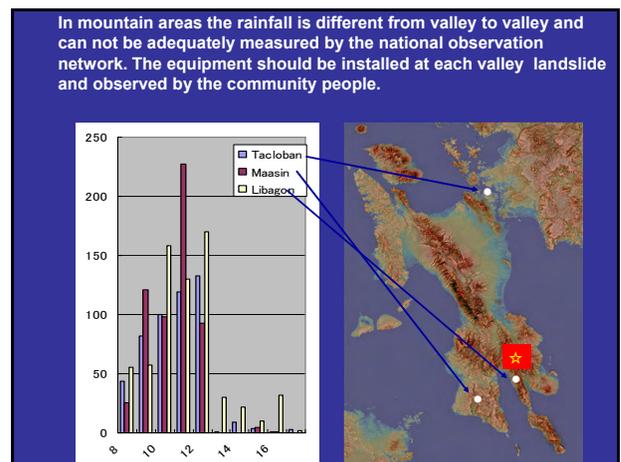
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## Discussion

Oi : First I'd like them to give some comments about the inspection tour. Later we'd like to have a discussion with the floor.

Kuroiwa : (I understand) why Shiraiwa Sabo Dam Complex should be World Cultural Heritage. This appears to be a contradiction, because when people think of culture, they do not think of engineering work. This is also the creation of people's ingenuity. It's not the product of putting information in computer. Then you finally get some products. It is creativity. For example, what impressed me before coming here. Of course, I was reading about three months ago about Sabo work. What impressed me in the field was how they made the best selection to locate Shiraiwa. It is not engineering work only. It's creativity. It means engineering judgment. When engineering judgment leads to that level, I think it's an art, engineering's art. You see art is culture. The second point I'm going to stress is that if this area is the real cultural heritage, then we'll attract many people, not common tourists but scientific, technical tourists, who will come to Toyama to learn and to speak in their own countries. It's important people come. For example, people who are decision makers in the high level of the government; they come to find now that investing in disaster reduction is high cost-benefit ratio. I want to talk only of those two points.

Oi : Thank you very much. Now Dr. Pasuto, please.

Pasuto : I would like to tell you that the longer I think about the visit we made yesterday, the greater is my conviction that we visited a real unit of masterpieces. Sabo works are artworks. This is why I noticed the great accuracy with which they built such dams. The selection of materials, natural materials and also they mixed different technologies, concrete, stones, green, so everything is mixed in a very-well manner.

Oi : Thank you very much. Now I'd like to invite questions and comments from the floor. Our discussion today will boil down to two themes: One is the spread of Japan's Sabo technologies to the rest of the world. The other is the crucial roles the Sabo works, the Shiraiwa Sabo dam in particular, play in the Joganji River basin and the efforts toward the listing of this area as a World Heritage site. That is, the Sabo works from both global and local points of view. The latter refers to Tateyama Sabo, including the Shiraiwa Sabo dam. We have only a limited time. Please feel free to make any comments regardless of the themes. Do you have any questions or comments? Go ahead.

From the floor: My name is Mr. Mizuno. I work at Tateyama Caldera Museum as a member of the staff who provides explanations on the inside of the caldera. I take general visitors to the inside of the caldera and give them fundamental facts about it. I have

been doing this for more than a decade. Today, I just heard from these two lecturers that they had visited the Shiraiwa sabo dam yesterday and been impressed by it. In fact, we often talk to visitors about the loose sediment or Tombi-doro, stressing that should the Tombi-doro slide down, the Toyama Plain would be buried in the sediment as high as two meters. This fact makes me realize that it is necessary to tell them the importance of the sabo works. I also talk about hillside works which prevent the sediment from sliding down. It is very difficult to make these talks easy and simple enough for visitors to understand. Some Toyama citizens are not familiar with the term “sabo.” I wonder how we are going to pass down this word to the general public. Believing that the Tateyama Caldera plays an irreplaceable role in communicating to people the importance of sabo and the horror of sediment disasters, I am convinced that it will be designated as a World Heritage site sometime in the future. Today I renewed my conviction that a global point of view is needed when we think all about this, just like we need it when we think about the global climate change. If either of the guests has any good idea, please share with us.

Oi: Thank you. Any comment, Dr. Kuroiwa?

Kuroiwa: Yes. OK. Thank you. I agree fully with you. We engineers may be—we are too close. When people think of engineers’ construction, they think they are good products. Others think it isn’t. It is very important that common people understand what the prefectural engineers, the Ministry of the transportation are doing for them. I think the only way to involve the community is when they understand what people are doing for them. On behalf of the people of Latin America—my face is Japanese, my name is Japanese—but now I’m representing a Latin American country, I would say “Domo Arigato gozaimasu.”

Oi: Pasuto-san, do you have anything?

Pasuto: I used to say that, generally, people have to know and the more they know the less vulnerable they are. So dissemination of knowledge is the key point in order to make the community safer. Here in Japan you have a long tradition of such dissemination because I know that starting from earthquake, landslide, tsunami and other kind of disasters, you produce a lot of materials. I think there are a lot of methods to disseminate the knowledge. This is one of the key points to stress. Disseminating the knowledge is less expensive than building a big structure to protect people. We have to make people safe by themselves.

Oi: Thank you. Any other questions or suggestions from the floor?

From the floor: My name is Takeda, an instructor working for the Prefectural Cultural

Property Protection. I feel very proud today after hearing that sabo technology, born in Japan, more specifically developed in Toyama, is utilized all around the world. Toyama Prefecture has been aiming to put Tateyama-Kurobe on the list of World Heritage sites, with sabo as its central theme. I was quite encouraged about the outlook, thanks to what the lecturers had to say about their visit yesterday. Would each of you share with us your view on the possibility of its inscription on the World Heritage list? Thank you.

Oi : About the possibility of its inscription on the World Heritage sites, they are not the specialists in this field. I am not sure whether they can give you helpful comments or not. Anyway I will ask them. Would you please?

Kuroiwa: Well, I think you have to try once. I heard something from my father: Shippai wa Seiko no Moto (Success is built on failure). So next time, you're going to get it.

Pasuto: I have some experience, since I followed the process that made the Italian Doromite world cultural heritage two years ago. The first speaker, Matsuura-san, told an important point, a concept of buffer zone. I mean, we do not have to take only dams, but also all the surrounding environment because dams and surrounding environment are closely connected with each other. So if I can give a suggestion, I want to stress the possibility to think wall's geomorphological systems, mainly constituted by caldera, sabo works around the river. If you look at this wall system, maybe the object is quite closer.

Oi: Dr. Kuroiwa, anything to add?

Kuroiwa: I've no question about that. However, I'm coming from a developing country, where hillside trees, even the Amazon jungle is being devastated. So the preservation of the green cover, the trees on the hill is a good lesson also Japan may teach especially to developing countries in Latin America and maybe also in Africa.

Oi: Next comment, please.

From the floor: I am Funahasi from Tateyamamachi. Are there dams in Europe which are more beautiful or larger in scale than Shiraiwa sabo dam?

Pasuto: I do not know if it's more beautiful, but what impressed me here is the system. It is not just the check dam. It is the system of different check dams. This is the good idea they had. They built not one check dam, but the system of dams to protect the city. This is not so common in the Alps and Europe.

Oi: Thank you for your comment. I understand that he found something here beautiful as a system, not so much as a single unit and he thought this whole system to be one of the most wonderful things he had ever seen. Next question?

While I am waiting for a question, let me talk a little. Dr. Kuroiwa is truly a prominent professional in Central and South America, active in spite of his age. He has written many books. Personally I have not read them yet, but I heard that he discussed sabo in details in some of those books. Whenever I have a discussion with officials from the Ministry of Land and Infrastructure, we tend to agree that the term “sabo” is a difficult expression, or the term “sabo” itself is difficult. Among experts like us, the term is understood without any additional explanation, but when trying to translate the term into English, we encounter complicated series of words such as “sediment-related disaster including landslides,” making us feel fed up just reading them. It is my dream that the day will come when the simple word “sabo” is understood worldwide without any explanation. The word “SABO” is used in Dr. Kuroiwa’s books and I am hoping that if more people start using it more often, the word would acquire the status of an internationally-recognized term. He has written his books both in Spanish and English, so I would like to ask him to use it more. Dr. Pasuto is, on the other hand, an outstanding figure in Europe. Sabo has its renown in Japan, but in order to spread sabo internationally, Japan’s lone battle, or Tateyama’s solitary fight, would not be enough. I think that it is most effective to join hands with other advanced places to disseminate sabo globally and have it take root. Well, we still have a little more time for opinions.

From the floor: My name is Ejiri, working for Nohara Construction Company, which specializes in hillside works, bank protection works, and sabo dam works in the south-westernmost area of Toga Village, Nanto City. Just days ago I had an opportunity to participate in a seminar on slits in a sabo dam incorporating the idea of applied bioengineering. I think that sabo works, which someone called a masterpiece of human wisdom, are what we do toward nature to protect human life, instead of working against nature or being hostile to nature. Recently, more attention is paid to environment. Would you please comment on the future of environment-friendly sabo, such as biodiversity as advocated at COP10?

Oi: Both of them have considerable insight in this field. I expect superb comments from them. Please.

Kuroiwa: Just this morning on our way back to Toyama, we saw what people are doing with the fish. They are trying a different method so that fish are able to go. I remember “Koinobori.” Something like that. I think—the only one example that Sabo is friendly with nature.

Oi: This morning we visited the fish passage built at Hongu sabo dam. I was quite impressed and others seemed the same.

Pasuto: If you remember one of my last sentences, I said today actually we had instrument

and methods to reduce the impact of such a structure. Japanese sabo engineers, especially, works all over the world, as they explain before, and they explained to me that they try to utilize natural materials, in-situ material in order to minimize the impact and maintain the effectiveness of the structure. This is a good strategy in order to reduce the impact and maintain the structure. Also some images that I show before illustrate how, engineers are now taking care of esthetics of structures. So I am sure we have methods and tools to do so.

Oi: Officials who have been involved in sabo at the Ministry of Land and Infrastructure as well as at the prefecture now think quite differently about environment. Reducing damage to the environment is an idea borne out of this change of thinking, but things have moved forward these days and now the frequently-used popular phrase is co-existence with nature. Nature in this case means environment. I believe this idea of co-existence with nature not only means just co-existing with humans or human society, but also with the entire environment. It is my personal belief that one of the goals of sabo is to create better environment.

Any other contributions?

I am afraid to suggest that this discussion needs to be brought to a close, as we have no time left. Please give another round of big applause to the two guests. Let me conclude this session by requesting Dr. Kuroiwa and Dr. Pasuto to join hands with Japan's sabo based on the capacity that each has and to work for the materialization of Tateyama sabo's designation as a World Heritage site.

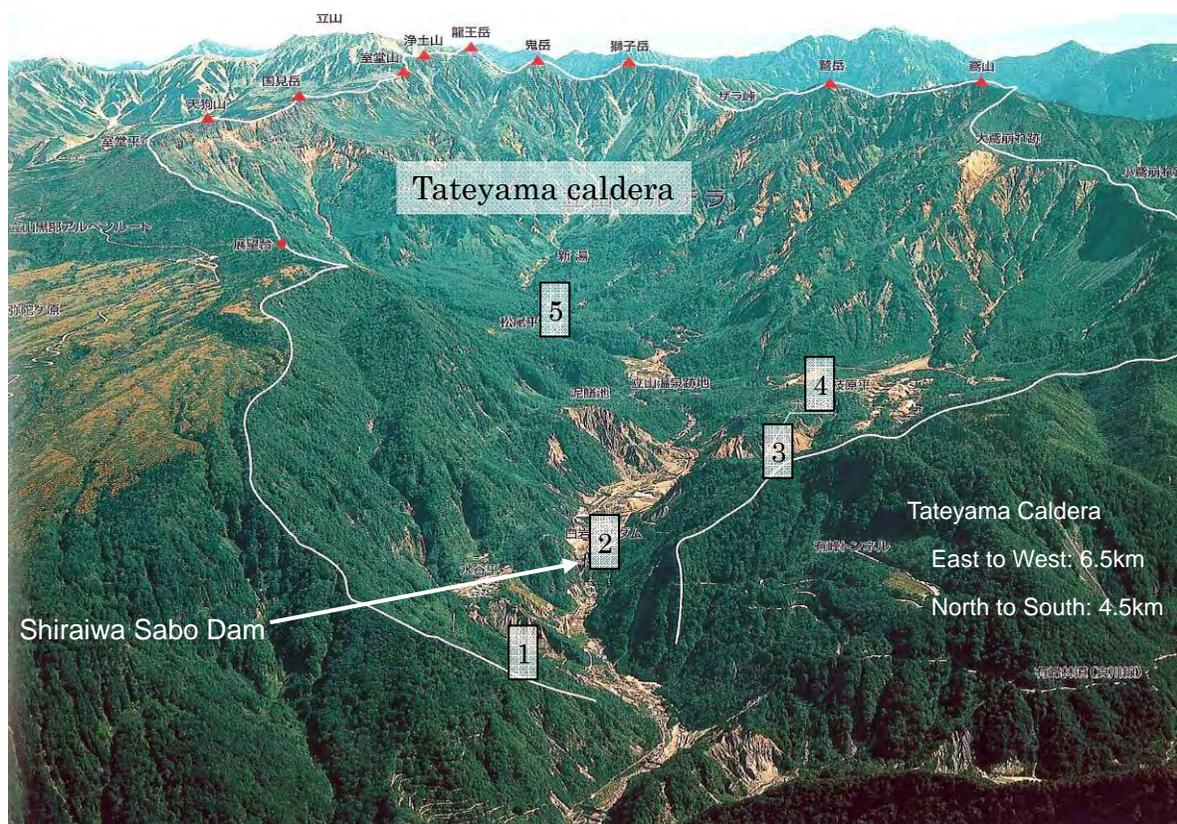
Field observation in Tateyama Sabo

# Field Observation Schedule in Tateyama Sabo

October 6, 2010

## ○Observation tour sites

1. Lookout point for the Shiraiwa sabo dam and Tateyama caldera
2. Shiraiwa sabo dam
3. Rokkyu-dani observatory
4. Dashiwara-daira observatory
5. Yukawa-dani(Yukawa sabo dam No.16)



## ○Meeting (Participants exchanged their inspection on Tateyama Sabo Works)

Place : Arimine house

## Field Observation in Tateyama Sabo

○Professor Kuroiwa

What impressed me most while visiting Shiraiwa Sabo Dam was that mountains were covered in lush green, which will provide developing countries with an excellent model. The lower basin of the river is also well managed. I feel a deep respect for the engineering works and hard work carried out there until now. As an engineer, I was extremely impressed with the fact that the Shiraiwa Sabo Dam was constructed at the right location.

Machu Picchu, a ruin of an ancient Inca city, is breathtaking for its own sake. It is also in perfect harmony with the environment.

As for the Tateyama Sabo Works, you should emphasize what magnificent undertaking your predecessors have achieved and how well the environment has been conserved as a result. Their efforts to prevent disasters have led to the recovery of green vegetation on hillsides. You could focus on a stark contrast between the past and the present.

This really is a valuable lesson for developing countries.

○Dr. Alessandro Pasuto

I was impressed by the fact that the Shiraiwa Sabo dams were constructed in a strategically important place in the upper reaches of the Joganji River in the mountains where there is little flat land.

Italy has also been actively carrying out Sabo works, but there is a difference between those of Italy and Japan. In Italy works are mainly implemented as a symptomatic treatment to deal with a sabo problem after a disaster strikes, while in Japan a comprehensive plan is devised and disaster prevention measures are implemented as a project.

Additionally in Japan, a variety of technologies were incorporated to minimize an environmental impact, which was quite unique considering the time period they were built.

For the Tateyama Sabo works to be inscribed as a World Heritage site, I would suggest that not only the role of sabo works, but also “the structures” and “the surrounding environment” be stressed. More specifically, it would be an idea to explain why the structures are considered unique as part of the environment

surrounding the Tateyama sabo project and to emphasize that the structures have been indispensable to protect lives and properties of citizens who live in the Toyama Plains. I believe that it makes sense to argue that the Tateyama sabo works are inseparable from the development of Toyama.

○Mr. Oi

It is absolutely necessary to let people know the importance of sabo. We also need to think about ways to do so. Citizens of Toyama are losing their memories about the disaster. Efforts are needed to pass on our experiences to the next generation. When experts discuss disaster prevention, few of them refer to sabo. Under these circumstances, we appreciate it if Dr. Kuroiwa and Dr. Pasuto could join hands with us in our efforts to spread the significance of sabo so that participants in government-level international conferences get to know more about it.

# Field observation in Tateyama Sabo



①

## first impression

Hydrometeorological disasters have substantially increased worldwide during the last half a century. According to the reports released <sup>in 2007</sup> by the Working Groups I, II & III of the International Panel for Climate Change, during the 21st century the average temperature will increase by at least 2 (two) degrees Celsius. So the climatic disasters will increase in intensity and frequency.

In this sense the outstanding Sabo Works developed in Toyama Prefecture for about a century of hard work and ingenuity <sup>for debris flow control</sup> are going to be very useful to reduce climatic disaster worldwide.

But there is an additional benefit for the humanity to declare Shiraiwa Sabo Works <sup>Humanity's</sup> Cultural Heritage Site, because <sup>World</sup> it will ~~attract~~ attract not only this ~~impressive~~ <sup>notable</sup> engineering work.

## first impression

common tourists but most importantly scientific / technical tourism, who would like to enjoy, as I did yesterday, the very impressive Sabo Works developed at the upper reaches of the Jogamji River basin, learnt how the hillside soil erosion have been reduced, by recovering the <sup>tree</sup> green cover. This is a very important lesson that Japan can show to developing countries where the hill green cover and the jungle are being devastated. It is also very <sup>important</sup> ~~impressive~~ how the river management is being made at lower basin of the Jogamji <sup>River</sup> ~~River~~. In addition to the training courses being implemented in Japan and abroad on Sabo works, a number of tourist visiting the Tateyama area, will replicate Sabo Works in their countries, and if the visitors are high members of ~~for~~ foreign ~~f~~

(3)

## first impression

~~gets~~ government, when taking  
decision how to invest official funds  
he would <sup>know</sup> that the ratio cost-benefit  
will be very high, so Sabro Works  
will continue to spread the <sup>word</sup> ~~words~~  
over and people and authorities of  
Tozama Prefecture would know  
that working hard and share the  
knowledge and experience of Sabro  
Works ~~is~~ ~~with~~ ~~the~~ worthwhile

First impressions after the visit on Tateyama Caldera and Shiroiwa sabo dam on October 6<sup>th</sup> 2010

By Alessandro Pasuto

The environment surrounding the Sabo works are really impressive: large areas are covered by vegetation and the traces of the disaster occurred in 1858 are completely deleted. This is mainly due to the action of the Shiroiwa sabo dams which favoured the stopping of erosive processes in the upper part of the Jougangi River basin.

As soon as I knew the morphological evolution of the area of the Caldera and had a look at the topographical map of the Toyama prefecture I suddenly realized the great importance the Shiroiwa sabo dams for the safety of the urban area. So one of the first point I have to highlight is the strategic role played by such structures for the safety of the entire big fan on which Toyama City lies.

Looking at the physical characteristics of the Sabo dams it is immediately clear the innovative approach the engineers followed in designing the entire system. I use the term "system" because it is not a merely check dam but a complex system of countermeasures planned to stabilize the huge amount of loose debris related to the Tateyama Caldera Landslide.

This kind of approach is certainly of great value and even more if we consider the period during which this project was carried out. Moreover the combined use of different typology of construction techniques as well as of different materials (e.g., concrete, natural stones, vegetation), remarkably reduced the environmental impact and make Shiroiwa sabo dams one of the most interesting and successful intervention not only in Japan but worldwide. It can be considered a sort of masterpiece and for sure a milestone in Sabo works. All the successive erosion control facilities built all over the world must pay a tribute to this pioneering sabo work which still preserves its effectiveness even after more than 70 years.

Fr all these reasons I believe Shiroiwa sabo dams are suitable to be included in the Unesco World Heritage and I will provide my support to this nomination.



Padova, Italy October 11<sup>th</sup> 2010