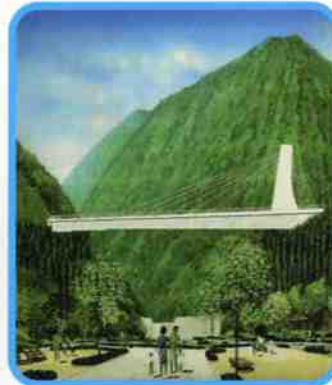
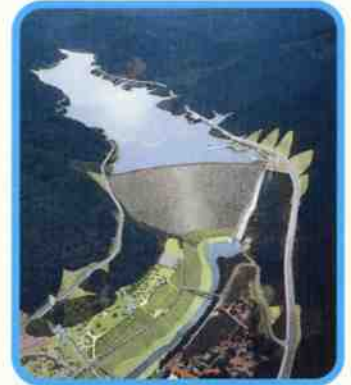


Surikamigawa Dam



Aim and Role of Surikamigawa Dam

Surikamigawa Dam is a multi-purpose dam currently under construction up the Surikamigawa River which is the branch of the Abukumagawa River (in the area of Moniwa, Iizakamachi, Fukushima-shi). The dam is scheduled to be completed in 2006. A multi-purpose dam is a dam constructed for various purposes. Following you will find explanation of the different functions of Surikamigawa Dam.

Role of the Dam

[Flood Control]

Surikamigawa Dam is one of the group of dams on the upper stream of the Abukumagawa River. It is being constructed on the Surikamigawa River which belongs to the water system of the Abukumagawa River. The dam is designed to pass up to 850m³/s of high water (the maximum planned water flow amount) adjustable by 30m³/s.

The purpose of this dam is reduce overflowing of the basin of the Surikamigawa River, and along with the group of dams on the upper stream of the Abukumagawa River this system of dams is to minimize the floods in the downstream of the main river.

During torrential rains caused by typhoons or fronts



How many times did the area suffer inundations triggered by typhoons, snow water, heavy rains, or during the rainy season, resulting in incalculable damage and loss...

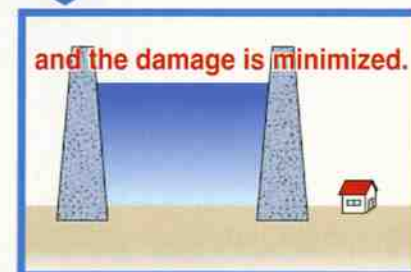
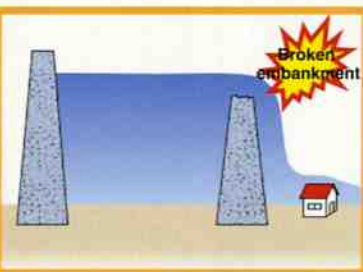
Without the dam...



With the dam in place...



And the downstream area...



[Maintenance of the normal discharge of the flowing water]

Maintenance of stable water levels will be possible even in the low water season with the dam, which in turn will contribute to preservation of the fauna and flora and other elements of the natural environment of the region. It will also allow supply of water for irrigation, waterworks, and the region industry currently using water. To accomplish that, Surikamigawa Dam will be capable of storing up to 37.2 million cubic meters of water during the flood season, and 34.4 million cubic meter in the non-flood season.



[Waterworks]



Including Fukushima City, a total of eleven towns and a city will be supplied with Water source in the amount of up to 249,000 m³ per day.

[Generating Electricity]

Along with the dam, a new power station, Surikamigawa Power Station, will be built. (Tohoku Power Co.) This power station will be capable of generating up to 3 MW of power. Being generated by the water power, this will be environment-friendly energy.



[Irrigation]

The dam will supply Irrigation water to an area of approximately 4,200 ha within 6 districts along the Abukumagawa and Surikamigawa rivers.

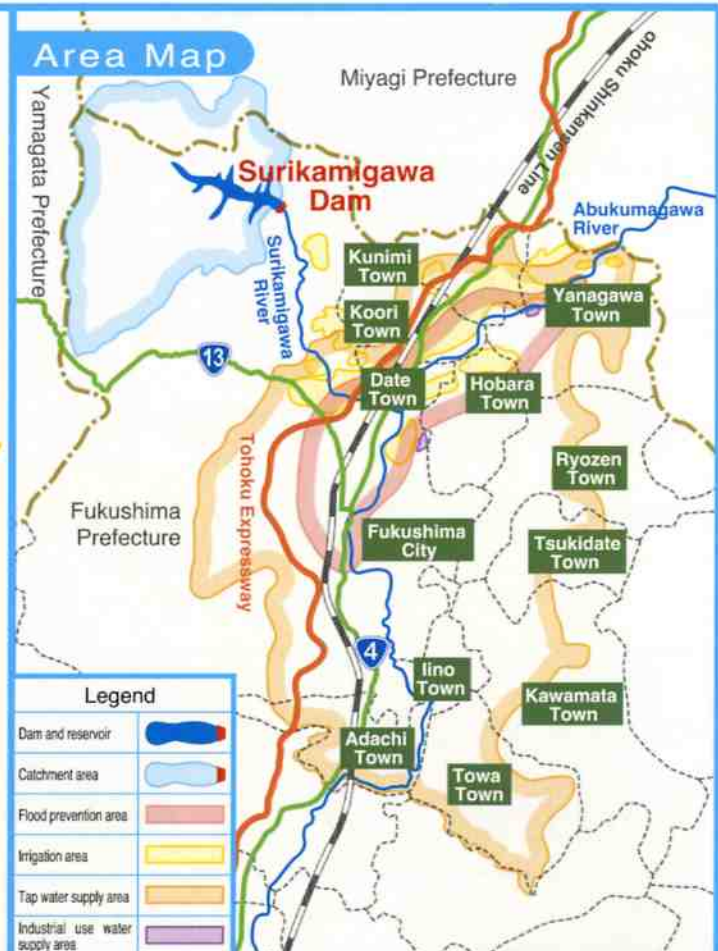


[Water for Industrial Use]

Up to 10,000 m³ of industrial water supply is available in the downstream area of Senogami in Fukushima Prefecture. This indispensable water source will contribute to the growth of the prefecture.



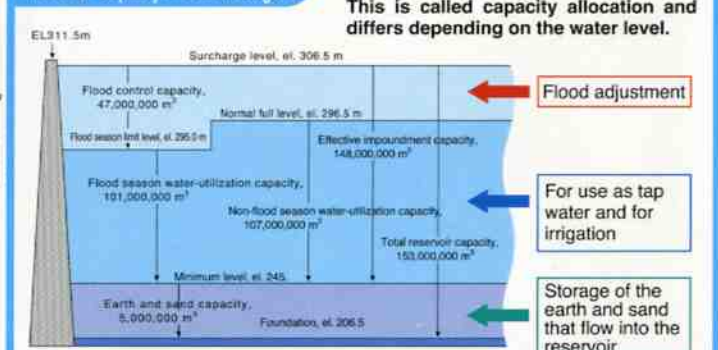
Area Map



Legend



Reservoir Capacity Allocation Diagram



History of the Dam

1971	Jun	Fukushima Prefecture requests the central government to conduct Surikamigawa Comprehensive Development Investigation
1973	Apr	Preliminary inspection by the central government
1982	Apr	Establishment of Surikamigawa Dam Research Office (commencement of research on the implementation plan)
1985	Apr	Name of the office changes to Surikamigawa Dam Construction Work Office
1986	Oct	Announcement of the basic plan for construction of Surikamigawa Dam
1990	Jul	Formal signing of the agreement on the General Compensation Standard

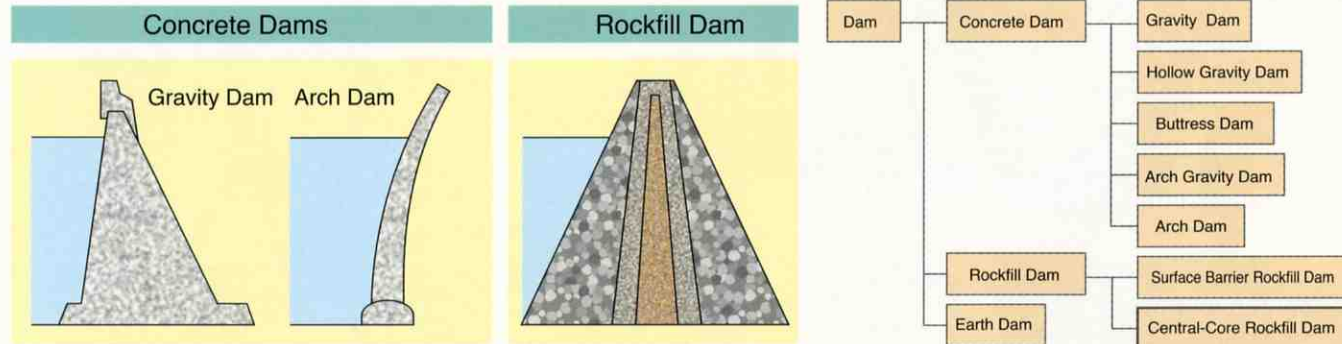
1991	Apr	Those who moved because of the floods begin to move to a substitute area
1993	Jun	Completion of the transfer of those who moved because of the floods
1997	Nov	Change of the flow of Surikamigawa River
1998	Feb	Announcement of change of the basic plan
	May	Construction of the embankment begins Pouring of the spillway concrete begins

About Surikamigawa Dam

Dams vary depending on their functions and structure. They are built based on thorough examination of the area and their purpose. Following, let us take a look at different types of dams as well as the structure and construction process of Surikamigawa Dam.

Types of Dams

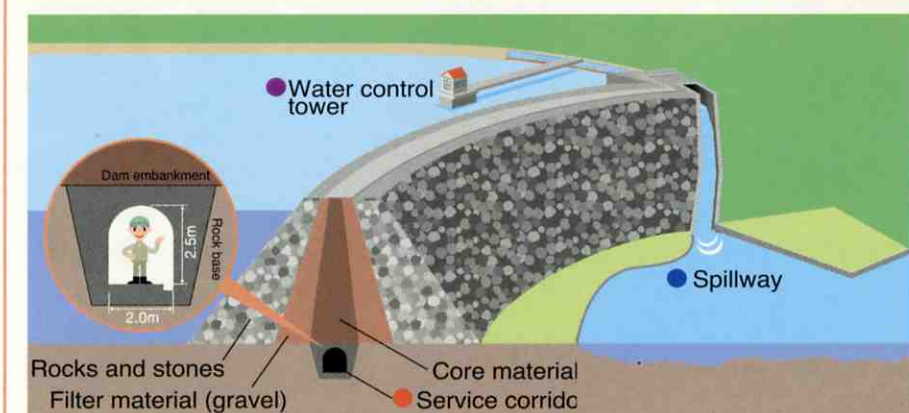
Depending on material a dam is made of, there are several main types of dams: (1) concrete dams if they are made of concrete, (2) earth and rock dams called rockfill dams, and (3) earth dams which are made of earth. The dams are further divided into sub-categories depending on their structure.



Structure and Main Facilities of Surikamigawa Dam

Surikamigawa Dam belongs to the rockfill-type dams and is called a central-core rockfill dam. This type of dams consists of the core material which stops the water. The core material is protected with filter layers, and the whole structure is stabilized by rocks and stones.

Central-Core Rockfill Dam



Service corridor



Service corridor is a passageway used for inspections, etc. The corridor is built under the dam and allows the servicemen to check the condition of the dam. Its length is approximately 800 m.

Water control tower



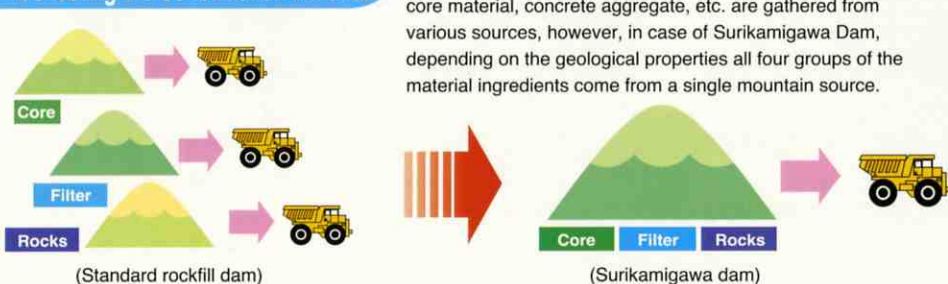
This facility is used to control the water stored in the dam. Through the control tower on the Surikamigawa River, it will be possible to maintain a normal water flow, supply of irrigation water, waterworks, industrial water, and power generation.

Spillway



This gate is used to adjust the flow of water during floods in order to maintain a safe level of water in the reservoir and to secure the dam itself.

Collecting the Construction Material



Scale of Surikamigawa Dam

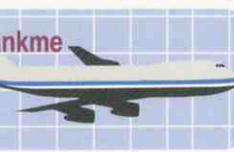
Height of the dam embankme

105.0 m
Approx. 2 1/5 of the prefectural office (the new office) (almost as high as a 24 story building)



Length of the dam embankme

718.6 m
Equal to as many as about nine Jumbo Jets (Boeing 747 = 80 m)



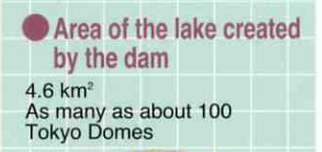
Dam capacity

153,000,000 m³
The whole Mt. Nobuo (in Fukushima City) can fit in.



Volume of the dam embankment

8,300,000 m³
As many as about seven Tokyo Domes



Area of the lake created by the dam

4.6 km²
As many as about 100 Tokyo Domes



Specifications of Surikamigawa Dam and the Reservoir

Dam name	Surikamigawa Dam
Location	Moniwa, Iizaka-machi, Fukushima-shi, Fukushima Prefecture
River	Surikamigawa River which belongs to Abukumagawa River
Dam Type	Central-Core Rockfill Dam
Embankment height	105.0 m
Embankment length (top)	718.6 m
Embankment volume	8,300,000m ³
Embankment top elevation	311.5 m
Total reservoir capacity	153,000,000 m ³
Ponding area	4.6 km ²
Number of displaced households	Number of displaced households 193

Construction Process of Rockfill Dam ~In case of Surikamigawa Dam~

Construction of a dam is a big project which requires several years from planning to completion. The process of construction requires expert knowledge and technology in a number of different fields. Below, let us investigate the construction process in case of Surikamigawa Dam.

Investigation & Planning

Before constructing a dam, it is first necessary to investigate the flood history and geology of the region, then plan the location, size, and role of the dam. Next comes the stage of examining the safety, economy, and impact of the dam on the environment, which in the end is followed by commencement of the actual design process.



Completion

When the construction is finished, the dam undergoes a test. It is filled with water and checked whether all is normal. If no problem is detected, the dam is completed.



River Flow Change

As construction of a dam is impossible with the river flowing through the construction site, it is necessary to make an artificial river (a tunnel for the Surikamigawa River) and direct the river stream there.



Under construction

Construction

The core material (clay) which stops water, the filter material (gravel) which protects the core, and the rocks and stones which stabilize the embankment are all carefully put in place and compacted.



Foundation Excavation

Since a dam is very big and heavy, its foundation ground (rock bed) must be hard. Earth and rocks are removed from the surface in order to prepare a hard ground.



Blasting

Material (except for the soil) for construction of the dam filter is obtained through the process of blasting designated hills.



Transportation

Those rocks and stones obtained through blasting which are suitable for construction of the dam are transported to the construction site. The material is carried by 46 t dump trucks which are approximately four times larger than regular dump trucks.

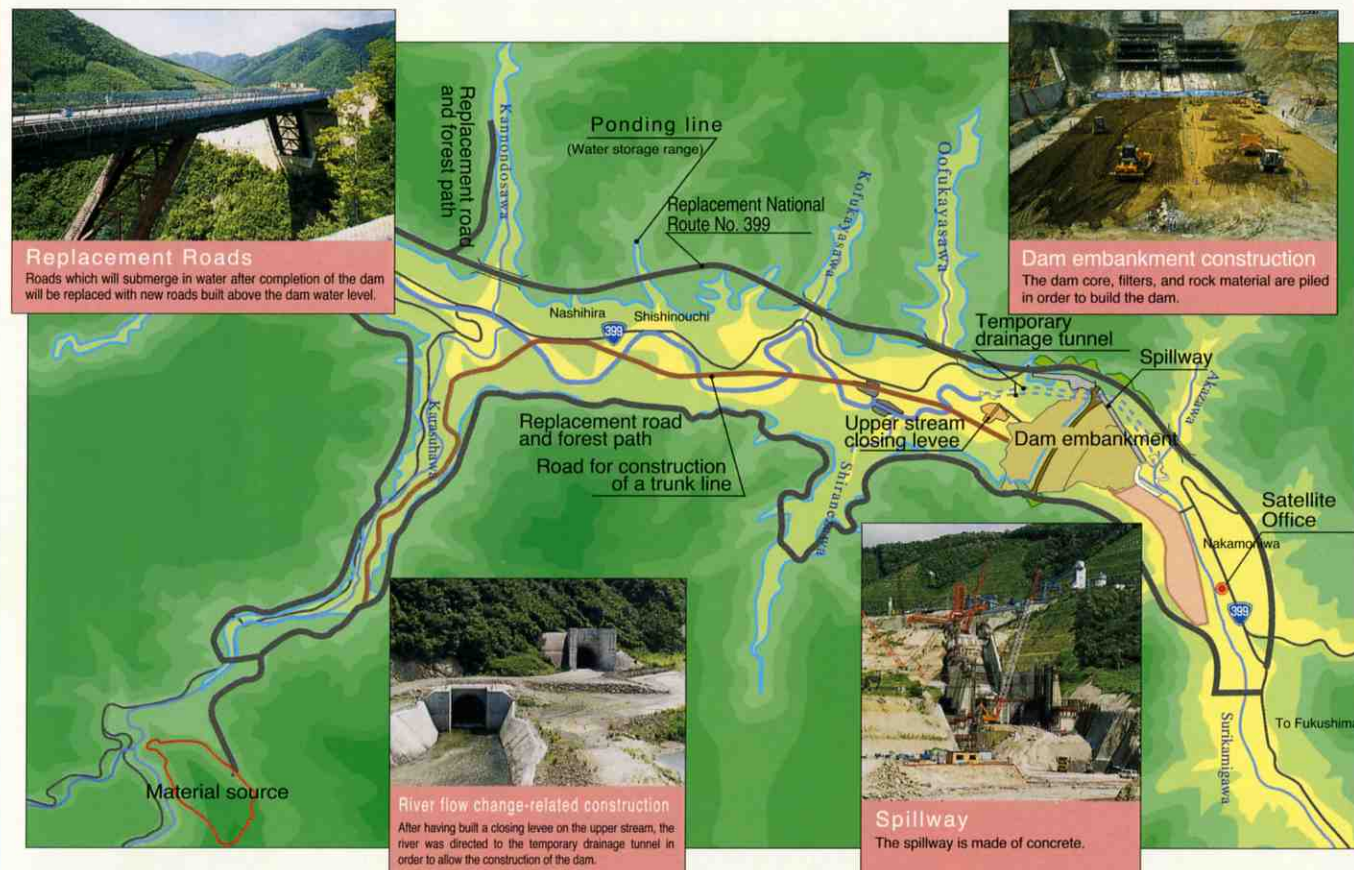


Present Condition of Surikamigawa Dam

Surikamigawa Dam whose construction began in 1985 from changing of the Surikamigawa River flow is currently in the stage of building the embankment, depositing the concrete spillways, and building the replacement roads.

Dam Construction

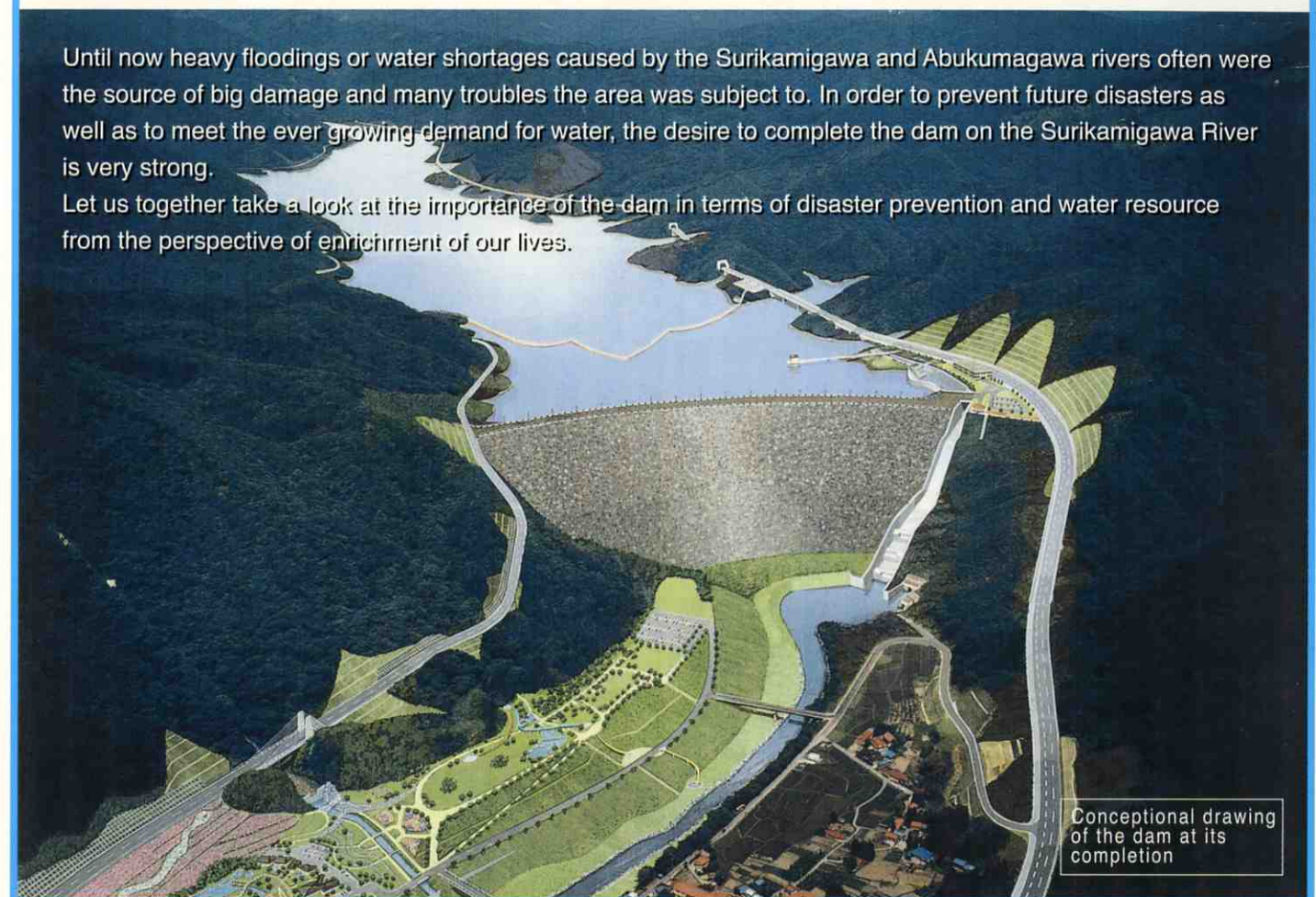
The dam project includes construction of various facilities, such as replacement roads, temporary buildings, etc. apart from the construction of the dam. Let us take a look at some of them.



With the dam...

Until now heavy floodings or water shortages caused by the Surikamigawa and Abukumagawa rivers often were the source of big damage and many troubles the area was subject to. In order to prevent future disasters as well as to meet the ever growing demand for water, the desire to complete the dam on the Surikamigawa River is very strong.

Let us together take a look at the importance of the dam in terms of disaster prevention and water resource from the perspective of enrichment of our lives.



Dam Vocabulary

Dam & Reservoir	A dam is a structure built across a river and valley in order to stop the river flow and store water, earth, and sand. The reservoir is an artificially created lake filled with water stopped by the dam.	Core, filters, rocks	The core in the zone-type fill dam is the zone which blocks water from flowing. The filter zone protects the core material against its outflow. Careful adjustment of its viscosity allows such state of semipermeability that water which penetrates this zone can be safely drained. The rocks and earth make up a permeable zone which stabilizes the dam embankment.	Food season / Non-food season	The flood season is usually a certain period of time in summer characterized by heavy rains. Non-flood season is the time of the year other than the flood season, usually in winter.	Basin	Basin is the area where rain accumulates on the earth surface and becomes a stream. This basin area is defined by both sides of the flowing water.	Surcharge water level	Based on the dam design, the surcharge water level is the maximum level during the flood season when the flowing water temporarily accumulates in the dam.
Dam site	Dam site is the area for construction of a dam.	Right bank / Left bank	When facing the downstream, the right bank is on the right side, and the left bank is on the left side.	Amount of precipitation	It is the amount of rain, snow, etc. which has fallen onto the ground expressed as the difference between the water level and the ground in millimeters. Snow and hail must first melt before measuring.	Normal full level	Based on the dam design, the maximum water level in the reservoir during the non-flood season.	Flood season limit level	The maximum water level which cannot be exceeded in order to secure flood controllability in the flood season.

To protect the rivers...

Effective use of water

Teeth brushing

An average person uses some three cups of water each time when brushing his or her teeth. Moreover, leaving the tap on just for one minute results in some six liters of lost water. Just a bit more care could save us a lot of water.

Washing

Washing using running water costs one 240 liters. But it is well known that 100 liters is perfectly enough to do a standard washing. The more water is used for washing each time, the more frequently one tends to wash. But why not rather wash more clothes less often?

Cleaning the waste water

Kitchen

It is still common to drain the waste water together with the small food leftovers. But why not use a drainboard net or used stocking in the corner of your sink to prevent the dirty waste water from free flowing with the food leftovers?

Food waste

Why throwing away the food waste, such as pieces of onion, etc. together with other waste? It's better to bury it in the garden, etc. It will become a valuable fertilizer to earth and pot plants.



O-furo bath

The water left over after o-furo can be used very effectively. What a waste to throw away so much water! It is still possible to use it for washing and cleaning. Give a challenge to try to reduce the amount of water used every day!

Car washing

Usually one uses a hose and tends to keep splashing his or her cherished car on and on. But this is just wasting of some 30 buckets of water on average. Even though troublesome, why not use a bucket to wash the car? This way five buckets should be just enough.



Tempura oil

Old tempura oil... Never throw it directly into the sink! Soak it into an old newspaper and throw away along with other waste.



Detergents

Many of the detergents and soap used everyday include phosphor which badly affects the river water. Use phosphor-free detergents in moderate quantities to protect our rivers.



Rice-washing water

Simple draining of the water after washing rice is wasteful. Use the rice-washing water for your garden and pot plants. It is an excellent fertilizer. Call it a clever approach.

Ministry of Land, Infrastructure and Transport

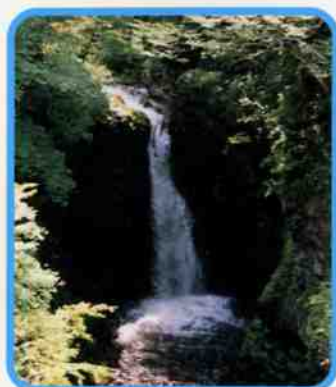
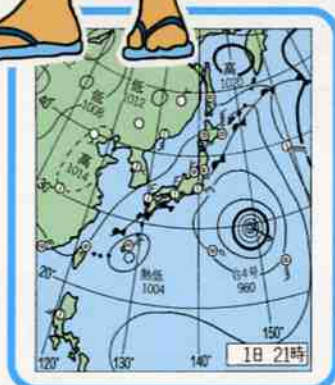
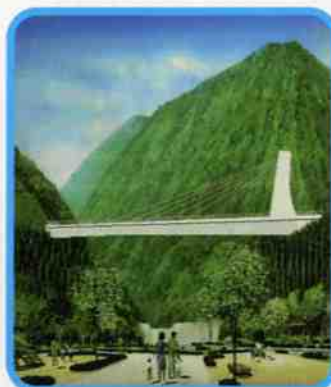
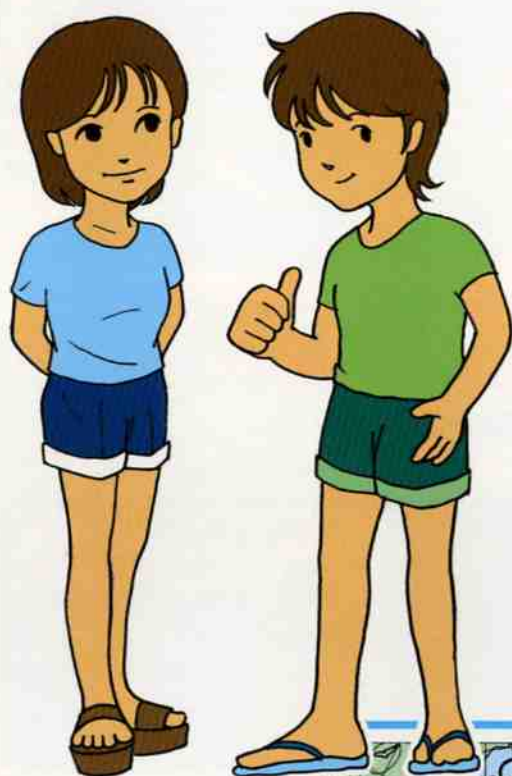
Surikamigawa Dam Construction Work Office

1-4 Omaeda, Hiranoaza,
Iizaka-machi, Fukushima-shi, Fukushima Prefecture
Tel. 024-542-8545 (main number)

摺上川水坝

—折上川水坝

Surikamigawa-dam



摺上川水坝的目的和作用 Aim and Role of Surikamigawa Dam

摺上川水坝是在阿武隈川的左支流“摺上川”的上游(所在福岛市饭坂町茂庭)正在建设的综合性水坝,预计 2006 年(平成 18 年)完成。综合性水坝就是拥有多种目的(作用)而建设的水坝。在此,让我们看一看摺上川水坝的作用。

水坝的作用

【控制洪水】

摺上川水坝,作为阿武隈川上游水坝群之一,于阿武隈水系摺上川规划,把水坝所在地的规划高水流量(规划中最大的流量)850m³/s,调节为高峰时期30m³/s。

由此,谋求控制摺上川流域的洪水,并与上游水坝群一起控制阿武隈川主流下游地区的洪水。

因台风和锋面下大雨时



因台风、雪水以及梅雨时的暴雨泛滥,多次发生洪水,其受害不可测量。

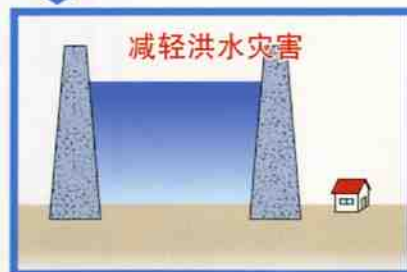
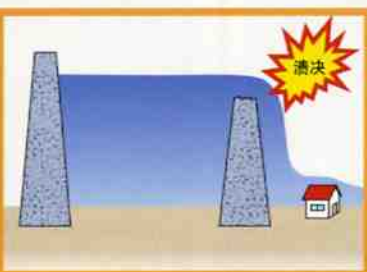
没有水坝.....



有了水坝.....



下游



【维持流水的正常机能】

汛期也保持安定水量,确保动植物等自然环境的保护以及现有用水(一直取水的灌溉用水、自来水、工业用水)。为此,摺上川水坝确保洪水期间最大 37,200,000m³水量,非洪水期间 34,400,000m³水量。



【自来水】

供应福岛市为首的一市十一町饮用等生活必须用水,一日最大供给量有 249,000m³。



【发电】

跟着建设水坝,新建摺上川发电站。(东北电力)发电站最大发电力有 3,000Kw,这是关心环保的水力发电。



【灌溉】

供应阿武隈川和摺上川沿岸六个地区约 4,200 公顷灌溉用水。



【工业用水】

作为福岛县的工业用水,溯之上下游地区,一日最大取水量可能为 10,000m³。确保对福岛发展必不可少的水资源。



作用地图



水库容量分配图

水库的容量按照目的划分,也叫做容量分配,以水位来决定。



水坝的历程

1971	昭和46年	6月	福岛县向国家提出摺上川综合开发调查的要求
1973	48年	4月	国家进行事先调查
1982	57年	4月	开设摺上川水坝调查事务所(着手施工规划调查)
1985	60年	4月	改称为“摺上川水坝工程事务所”
1986	61年	10月	布告有关建设摺上川水坝的基本规划
1990	平成2年	7月	“摺上川水坝一般补偿准则”达成签字

1991	平成3年	4月	淹没地区开始迁移到代替地
1993	5年	6月	淹没地区基本上结束迁移
1997	9年	11月	摺上川主流变更流路
1998	10年	2月	布告变更基本规划
		5月	开始堆积坝体 开始泄洪口的混凝土浇筑

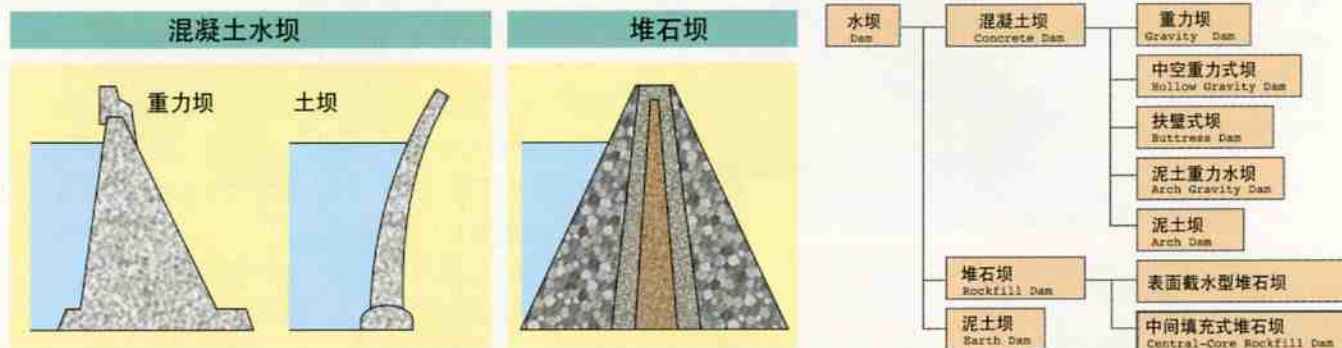
关于水坝

About Surikamigawa Dam

水坝按其作用和构造分成各种类型。水坝，综合地研讨其目的以及地质，而建设最合适的。在此，让我们看看水坝的种类、摺上川水坝的构造和其工程。

水坝的种类

水坝在于其材料，大分为三类——用混凝土建造的混凝土坝、用土和岩石建造的堆石坝和用土建造的泥土坝。这些基于其构造再分成细小部分。



摺上川水坝的构造和主要设施

摺上川水坝是堆石坝之一，称为中间填充式堆石坝。其构造是采用截水的填充材料和保护此填充材料的过滤材料以及固定坝体的岩石材料而构成的。

中间填充式堆石坝



监测廊



监测廊是为检查水坝的管理而用的走廊。监测廊设置在水坝的底部，人可以走进去进行检查，其长度约有 800 米。

取水塔



水库蓄水的取水设施。摺上川水坝取水塔维持流水的正常机能，并取灌溉用水、自来水、工业用水以及发电站用水。

泄洪口



调节洪水流量，为确保水坝和水库的安全所设置的放水设备。

开采材料

一般地说，建造堆石坝时从几个采取地采取岩石、过滤、填充、混凝土混合等材料，但摺上川水坝是从一个材料山开采适合地质的四种材料的。



摺上川水坝的规模

水库坝体的高度

105.0m
福岛县厅(新建)的两点二倍
(相当于 24 层的大楼)



水库坝体的长度

718.6m
相当于九架大型喷气式飞机的机身长
(747 客机=80m)



水库的蓄水容量

153,000,000m³
能装进整个信夫山(福岛市)



水库坝体的体积

8,470,000m³
相当于七座东京半圆形屋顶棒球场

因水坝而成的湖面宽度

4.6km²
相当于一百座东京半圆形屋顶棒球场



摺上川水坝和水库的概要

水坝名	摺上川水坝
位置	福岛县福岛市饭坂町茂庭地内
河川名	阿武隈川水系摺上川
形式	中间填充式堆石坝
坝高	105.0m
坝顶长	718.6m
水坝体积	8,470,000m³
坝顶标高	EL311.5m
总蓄水量	153,000,000m³
蓄水面	4.6km²
迁移房屋数	193 户

堆石坝工程

~摺上川水坝的情况~

水坝是从着手规划时达到完成时为止需要几十年的大规模工程，为此需要各种各样的知识和技术。在此让我们看看摺上川水坝是怎么建造的。

【调查、设计】

建设水坝前，关于以往的洪水和地质等的情况进行调查，规划水坝的位置、大小和用途。按照此规划综合研讨安全性、经济性和对环境的影响，而实行水坝的设计。



【完成】

堆积完毕，试验蓄水，确认水坝和水库没有异常，水坝才完成。



【变更流路】

实行水坝工程时，由于在河水自然流的状态不能进行工程，要朝着人造河(在摺上川水坝就是隧道)改变方向(变更流路)。



【堆积】

用水通不过的填充材料(粘土)和保护填充材料的过滤材料(砂石)以及固定坝体的岩石材料(岩石)，各各仔细地凝固堆积起来。



【地基开挖】

水坝非常大而重，因此，地基的地面(岩盘)总要坚硬，所以去掉表面的土和岩石。



【爆破岩石】

把叫做材料山的堆石坝材料的开采场爆破削平。



【搬运】

把削平材料山的岩石中选择适合的材料运到水坝那里。材料的搬运用比一般约大四倍的 46t 大型翻斗车。



现在的摺上川水坝 Present condition of Surikamigawa Dam

1985 年(昭和 60 年)着手建设的摺上川水坝已完成变更流路工程,正实行坝体的堆积、泄洪口的混凝土浇筑、线路变更道路等建设。

水坝工程

水坝建设除了本体工程以外,还要实行线路变更道路和临时性工程等各种工程。在此,介绍一下其中的一部分。



线路变更道路
在比水坝的水位更高的地方新建替因水坝淹没的路线的道路。

堆积坝体
堆积填充、过滤、岩石材料,修建水库坝体。

变更流路
上游围堰堤建成后,把河水流入临时排水隧道,经过水库坝体的工程现场去。

泄洪口
用混凝土建造泄洪口。

水坝用语

水坝水库

所谓的水坝是为了横过河川或溪谷等,截流蓄水、堆积土砂所建的水库是跟着水坝而所建的人造湖。

坝址

建设水坝的用地

填充过滤岩石材料

填充材料也称作区域型堆石坝的断面区域。过滤材料指防止断水材料流出,以安全排出透水的目的调节程度而设置的半透水性区域。岩石材料是为加固坝体设置的透水区域。

右岸、左岸

背对着河的上游,右边就是右岸,左边就是左岸。

洪水期、非洪水期

洪水期主要指夏季降水量多的时期。非洪水期就是洪水期以外的时期,主要指冬季。

降水量

就是下雨和下雪的量,单位以水位的深度(mm)表示。如雨雪和霰子以融成水的状态而量。

流域

降水汇集成流水(河)的区域,或者河沿岸两侧区域。

常时满水位

水坝规划中,非洪水期水坝蓄水的最高水位。

最高水位

水坝规划中,在洪水期把流水一时蓄水在水坝时的最高水位。

洪水期限制水位

为了确保洪水期的洪水控制容量规定不能超过的蓄水水位。

跟水坝一起……

至今为止摺上川和阿武隈川流域多次遭受洪水和枯的严重的灾害。为了避免更大的灾害,并补充逐年增加的生活用水,人们强烈期待着摺上川水坝的建成。那么,朝着水坝的建成,让我们一起考虑一下我们生活发展中防灾以及水资源的重要性!



有效地利用水

刷牙

刷牙一次只用三杯水就行。任其不关上一分钟就会白白浪费六公升(公升)水。请每天稍微注意一下,以免浪费。

洗衣

水一直开着洗衣会浪费二百四十公升水。但实际洗 1 次衣只要一百公升水就可以完成。请注意洗衣时不要将水过度出来以及洗衣的次数,尽量将要洗的东西集中起来一起洗。



净化生活排水

厨房

经常可以看见从洗碗池直接冲走细小的烹调垃圾和吃剩的东西。请在洗碗池的三角处巧妙地使用滤网和用不了的丝袜以防止污水流出。



厨房垃圾

作为一般垃圾扔掉的菜渣等厨房垃圾,埋在地里就可以成为丰富的土,并可以作为栽种的树的肥料有效的利用。



为了保护河川……

洗澡

日常生活中最可以有效利用的是洗澡的剩水,就这样流走太可惜了!还可以用于洗衣和清扫。您不想试试在每天的生活中向减少浪费挑战吗?



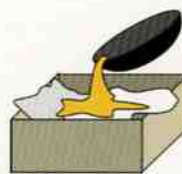
洗车

洗车的时候,多数容易用胶皮管冲水。但这样做大约浪费了三十桶铅桶水。有些麻烦也提水桶洗的话,五桶水就够了。



油炸的油

油炸了的油决不许任其就那样地流。请用报纸吸收后再当作垃圾扔掉。



洗涤剂

洗涤剂和肥皂含有污染河川的磷。所以,请使用不含磷的,按定量使用以保护河川。



淘米水

淘米后水流走就成为排水,但把它流入盆栽和院子里,可以作为肥料再利用。这也是可以稍微放在心上的事。



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