

A PRELIMINARY TEST CASE AND ITS RESULT FOR  
PLANTING TREES ON THE DESERT AND THE STEPPE  
AREA IN INDIA

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by

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THE TEST CASE FOR PLANTING TREES ON THE DESERT  
AND THE STEPPE AREA IN INDIA MADE BY I.C.W.A.

I.C.W.A. has guided industrial technics and national life by request of a disciple of Mahatma Gandhi. When I.C.W.A. visited each place of India and it investigated the area of Buddhism and the other areas of ancient culture to solve some difficult problems which they were confronted, it was cleared that these areas had lost forest and they had advanced in becoming the desert and they had become the hardest starvation condition. Therefore, I.C.W.A. has considered that some Indian problems cannot be solved until the above condition is solved.

For this purpose, It has inspected each actual condition of India among 10 years- geological features, plants, geographical features, strata, the national life and the technics. Then, it has selected the most suitable place for solving the problem in each area of India and it has carried out an experiment for seven years.

THE TEST CASE CARRIED OUT IN KASTURBA SEVA MANDIR,  
RAJPURA AREA' IN INDIAN PLAIN OF THE FOOT OF MTS.  
HIMALAYA

a. Geographical character

Rajpura area, Kasturba Seva Mandir exists, has Jamuna Rv., a branch of Ganges Riv. called " mother of India " and five branches of Satlaj Rv. and it lies 100 km. west of Chandigarh city of the foot of mountains of Punjab state.

b. Geological features and the geographical features

The geological features and the geographical features of this area should be considered from back Mts. Himalaya.

Most of Himalayan zone of Punjab state is a lime stone hill, (correctly saying, a metamorphic rock of lime and silica) which was upheaved from the sea in the Paleozoic era. This hill runs from northwest to southeast with many folds, and this hill became higher and higher and at last this hill is ranged in real many folding Mts. Himalaya with fullscale in HIMALCHULI of PRADESH.

This Himalayan zone is metamorphic rock of silica sand. This geological features of the mountains run from northwest to southeast is carried by the five branches of Satlaji Riv. across the mountains at right angles, and it forms alluvial land. This is the Indian Plain of Punjab state which spread to the Indus Plain of Pakistan.

Rajpura is the alluvial land between Jamuna Riv. and Satlaji Riv.

Therefore, the depth of piled soil carried from the Himalayan Mountains is more deeper than 400 meters, and an underlayer is the soil of lime stone and the upper layer, mixed soil of silica sand and lime stone.

This is a basic form of piled soil, however, the aspect of Satlaji Riv. shows that a number of changes has occurred in history of the earth. It is an actual condition that this basic form lies in many strata.

#### c. Desert phenomenon

Rajpura is essentially a middle zone of this alluvial land. This alluvial land spreads into the Indus Plain with a belt condition over 500 km. and it is a very vast area as Rajpura, this land is on the slope at the height of 150 to 300 meters.

It is sure, however, that the geographical features of this area is the alluvial land.

Characteristically, the geological features is sand of lime stone and silica sand, so the soil is very bad in keeping water, and the underground water is very deep.

There is a fountain line which the alluvial land has peculiarly, at the height of about 200 to 250 meters in the alluvial land of the foot of Mts. Himalaya.

Besides the river of this area, it is ordinary that after the fountain which springs out by water pressure come from Mts. Himalaya comes out once on the surface of the earth, it crept under the ground because the geological features is sand, so there is no way except making use of fallen leaves by planting trees to keep water and to stream water on the surface of the earth, and to neutralize alkalinity as much as possible.

For this purpose, it is necessary to plant a rapid growing tree, which kind of tree it may be, so that alkalinity of the earth may be neutralized, and water may be reserved on the surface of the earth keeping from creeping under the ground, and the surface of the earth may be wet by helps of a green shade, and then it makes easy for other plants to grow in.

#### (Experimental condition)

Punjab state planted an eucalyptus tree which native to Australia in 1966. This work was not promoted by only my association, but it was agreed one occasionally with the Indian Gov. and the others. As this association persuaded Indian Gov. and some friends of Punjab State to plant the fastest growing tree, the eucalyptus tree was selected and planted.

At that time, it was considered that any kind of trees should be planted, which kind of tree it might be, without considering a way which was to plant trees from Mts Himalaya and the slope of the alluvial land making use of mountains and water to solve the desert basically.

This tree was almost no useful for Indian people, and the fallen leaves were not used manure because of dryness, so it was helpful in only green shade and in softening climate by sucking the underground water and the surface water of the earth by planting trees.

Therefore, it required some devices and considerations much more to develop the planting trees Movement by hands of the nation, and to solve the desert.

Especially, Indian Gov.'s order was strict more and more to Indian people, because it has some problems among Indian Gov. and the nation, that are a class of nation and race problem, and then, the people of India have become more unconcerned. And Indian Gov. has thought that tree plantation must make up by useless tree, so that the people may not use up the tree for fire wood or the food of the cattle. And then, the Planting tree Movement has stopped.

(Effect)

The eucalyptus tree has been planted all over the Government place of Punjab state.

The eucalyptus trees grow along all roads, all rail lines, and all canals, as though they made a green wall against the sun.

It is the truth that it has become possible to plant a paddy rice, potatoes, and wheat, by three crops a year with development of a canal and a well and improvement of breed.

This area has changed into a granary of India.

(Notice)

We must consider that it is absolute impossible to change half way in case of putting only one method in practice for experimenting in India and the other developing countries.

We should consider that amendment may bring a kind of danger.

#### THE TEST CASE ON THE FOOT OF DECAN HILLS

I was awared that ancient culture brought the desert in Indian Plain, and I was walking around considering a solution of the desert. And I happned to see Swami Madu Anand, a saint of Hinduism, and a great desciple of Mahatma Gandhi at Swaraj Ashram of Bardoli in Gujarat state where Gandhi started a famous March of Salt as the first Independent Movement, in 1967.

As the result of cooperative study about the dogmas of Shintoism of Japan and Hinduism with Swami Madu Anand, we agreed in our opinions, I stated that it was necessary for India to plant trees, and to make irrigation to make use of mountains and water. Then, Mahatma Anand asked me to write "What is Green Revolution?" and I wrote it and I gave it to him.

Therefore, I was introduced to Mr. J.S.Patil, a principal of Agricultural Institute of Kosbad Hill, Maharashtra state, where the foot of west of Decan Hill by Mahatma Anand in 1978. Then, I fixed this agricultural school as an testing area.

Next, in 1969, when Mahatma Gandhi's 100 year ceremony was held at Samanbaya Ashram by members of the great disciples of Mahatma Gandhi, I was invited to the ceremony by the oldest disciple Dr. Kakasaheb Kalelkar. And at that time, I was asked to guide agriculture in the elementary school of Samanbaya Ashram which was made in a village of the Munda race, the interior of south of Buddagaya. Then, I taught agricultural technics in the school, and I fixed this area as the testing area.

## A. THE TEST CASE OF AGRICULTURE COLLEGE IN KOSBAD HILL

## 1. The geographical character

This area is near Daman city, 200 km. north away from Bombay. The weathered Decan Hills extends along the river, and this area has large and small monadnocks.

Kosbad Hill is about 50km. north east of Thana, and it is in a small monadnock of inland 20 km. from Arabian sea, and it is 50 meter high. This testing area is alluvial land between this monadnock area and the monadnock of Decan Hill that is 150 meters high.

## 2. The geological features and the geographical features

This area of Decan Hills is weathered by many rivers and it forms many weathered monadnocks from a tableland.

Decan Hill seems to be in strata from the upperest, granite bed silicious bed, and basalt bed originally. This area, however, has only the basalt bed as the granite bed and silica bed are washed.

Kosbad Hill is between the last hill approached to the coast line of the monadnock of basalt rocks.

### 3. The desert phenomenon

There is the alluvial land with a belt where the edge of a basalt hill is weathered between Kosbad Hill and some hills of the edge of Decan Hill.

The west cliff of Decan Hill which faces is washed out, and weathered and collapsed, the soil is carried by rainwater of the rainy season, and this area is the place where the carried soil is piled. The geological features of a layer is simple stratum which is sand of weathered basalt bed.

The piled soil is 100 meter high and the underground water of this alluvial land runs at the depth of 20 meters under the ground, so the surface of the earth shows steppe condition with lown, but some place has no lown.

Especially, the inhabitant of this area is a part of race of the native people, and he earnes his living by making earthen ware, and his house is a hut made of wood, and the wall is covered with grass and bamboo, and the roof is thatched with straw.

Then, this area forms the steppe condition near the desert because the soil carried from the west cliff of Deccan Hill forms the alluvial land, unlike the desert condition caused by products of brick, earthen ware, and iron ware and by lost of forest can be seen in Punjab state or the area of Aryan race of Indian Plain.

Thus, this area is a simple form, and this area has rainfall, so, this area has the best condition for testing of planting trees.

### 4. Special conditions

Especially, Mr. J.S.Patil, the principal of Agricultural Institute in Kosbad Hill, was a very able person. He was sent to U.S.A. by Indian Gov. to study agriculture. Then, he considered the large-scale farming of U.S.A. was not suitable because India was divided in small pieces. And he inspected Japan and Taiwan, and he founded this school. Therefore, it was very easy to guide him and to make him understand because he knew the agriculture of Japan and Taiwan very well.

Also, this area was the center of Mahatma Swami J Mado Anand's

activity, Mr. Patil knew "What is Green Revolution?", a guiding report of a plant of irrigation ways to plant trees in India made by I.C.W.A. He had attitude of adopting this way.

Also, the inhabitant did not know that a tree could be used in firing bricks or iron by cutting the tree, so I had no afraid that they would cut trees selfishly.

## 5. The experimental condition

The agricultural college of Kosbad Hill was already founded in 1950, and this school invited Prime minister Indera Gandhi and it finished arranging a farm of the first term in 1967.

On the slope near to Kosbad Hill, the alluvial land which is between Kosbad Hill and monadnocks of Deccan Hills, and on the area of a middle stream near to Kosbad Hill, water could be supplied by well for a rice field, and the field was cultivated, and Formosan rice was succeeded, and a leguminous plant of GLYRICIDIA that has come from the South India.

Especially, it should be taken notice that besides of useful plants like mangos, or the others, each kind of useful trees began to be planted on the farm and it was delivered to farmers free of charge, and the Planting Movement began by hands of the people.

Though there was no forest on the alluvial land from the monadnock of the west edge of Deccan Hill, this school put to test cultivating, but in vain. Underground water was very deep and the soil and the surface of the earth was bad in keeping water, and also the soil of basalt rock was very dry with a crack, and it brought a failure. And the monadnock has no forest on its whole hill, and it showed a steppe condition covered with brown red soil and gravells weathered basalt rocks.

( Test case)

In 1978 and 1979, I.C.W.A. started to guide based on its plan.

- (A) To dig a small tank on the stream side along a stream from the foot of west slope of the monadnocks of west edge of Deccan Hill, to dig a creek toward the alluvial land from a small tank of a stream, and to put the rainwater in the creek.

(B) To plant young trees of teak from the foot of west slope of the monadnocks of the west edge of the Deccan Hill in the beginning of the rainy season. To plant the leguminous plant of third year Glyricidia which can be used for manure all over the alluvial land.

The above plan was carried out from 1970 to 1972.

#### (The effect)

In 1975, the young teak trees planted on the foot of monadnocks in the west edge of the Deccan Hill reached at near 3 meter high and awns reached at 2 meter high. And the alluvial land became a rice field and a small tank and a creek( a water way of irrigation) extended to the downstream and the field was spread on the alluvial land.

The depth of water rose up at 2 to 5 meters and a hand pump enabled to supply water.

#### B. THE TEST CASE OF THE ELEMENTARY SCHOOL OF SAMANBAYA ASHRAM IN A JUNGLE PLATEAU OF THE EDGE OF DECCAN HILL, INNER WEST OF SOUTH BUDDHA GAYA

The dryness of the Ganges area along the shore of the Ganges Riv. had brought the worst condition and Bihar state of Indian Gov. declared the starvation condition in 1964 over three years.

Between 1966 and 1967, Samanbaya Ashram of Buddha Gaya started the activity of a relief work of starvation and Director Dowarko Sanderani engaged in the relief work for the village of Munda race scattering the jungle plateau of the edge of Deccan Hill, 50 km. to the south of Buddha Gaya.

When he passed a village, there was a woman crying with a baby on her bust, and taking her children three years and five years with her hands.

He asked her reason, why she was crying, she said that she had not food about one week, she could not move these three days, so she would be died, and she was afraid what her children would be.

As Shri Dowarko Sanderani gave food and water to her, she asked him to bring up her five year daughter.

Then, some village people asked to bring up their children.

This was the beginning of the elementary shool of Samanhaya Ashram.

Shri Dowarko Sandrani built a hut on the hill of the village for the relief work and the elementary school, and he admitted children and the number of the children became about twenty.

In 1968, he cleared the land of the hill and plowed a field to live with the children in a rainy season, there was almost no crop.

Mr. Tatsumaru Sugiyama, General Secretary of I.C.W.A. who attended at the Gandhi's 100 year ceremony with the high members of disciples of Mahatma Gandhi, and Dr. Kakasaheb Kalelkar asked him to inspect this area and to teach as well as Kosbad Hill.

### 1. The geographical character

This area lies the edge area of the plateau of the north-east of the Deccan Hill. This area is a hilly country washed away by Mahanadi Riv. Palmar Riv. and Lilajan Riv., branches of the Ganges Riv. streaming on the Indian Plain.

Especially, it should be considered that the Ganges Riv. streams at the balanced point between the water pressure from the Himalayan Mountains, and the Deccan Hills, and silica rocks of the Deccan Hill which support the mountain was exposed at the junction of the water pressure of Gundak Riv. from the Himalayan Mountains and the Son Riv. from the Decan Hill and this area is an inside pocket with a comb shape.

Therefore, we must consider the water pressure come from Himalayan Mountains and the Deccan Hill.

### 2. The geological features and the geographical features

This area is a hill which the Deccan Hill was a geological tableland which was created in the genesis of the crust of the earth, and the Deccan Hill was eaten away by the Mahanadi Riv. and Palmer Riv. and Lilajan Riv, and the upper granite bed was remained at the top of the monadnocks, and this area is the foot of the hilly country of the monadnocks.

The surface of the earth was covered with silica sand with much iron, the underground stratum was already weathered one of feldspar bed and the silica bed.

The soil is easy to flow by a rain because of very easily moved soil.

In the table land of Samanbaya Ashram, a fountain which flows from the monadnocks of the Deccan Hill spread into the easily moved weathered rocks of this vast erosive hill and it became a hidden water, and it comes out as the fountain at the edge of the tableland of Samanbaya Ashram. Then, the village of Munda race has settled down at the fountain.

### 3. The desert phenomenon

In India, the Aryan absorbed the Indus Culture and he invaded along the Ganges Riv. with an iron culture and pottery and a brick culture about 5,000 years ago.

In Patna, Gaya, Buddha gaya, the invasion of the Aryan race contacted with Bengal culture which prospered at Culcatta, and at that time, Buddhism was borned.

According to the record of ancient times, these areas were beautiful sceneries. And to make reference to Hsuang-Chung's record, this area was a little declining after the height of Asoka dynasty adopted Buddhism. In the above stated area where the mountains of quartzite rocks push out in-to the Ganges Riv, there is famous Rajgir and the remains of Asoka dynasty. According to Hsuang-Chung's record, this Rajgir had 400 fountains and hot spring and it was very beautiful scenery. At present time, there is a hot spring at north gate, and there is no forest around. The mountains of quartzite rocks lie in two rows from southwest to northeast, and this area lies in ruins and water is dried up.

Samanbaya Ashram beyond the Mahana Riv. the northeast of the Gaya Mts. where Buddha biving up asceticism, and this place is Buddha Gaya where he was spiritually awakened under the linden tree after basing in the Mohana Riv. passing through the asceticism forest.

On the top of the Goya mountains, Buddha's ashes of Asoka dynasity existed with three bases, and many temples were built in

Buddha Gaya. The above can be gessed from the condition which some broken pieces of pottery and bricks aroung the field.

There is no forest within about 50 Km. centering Buddha Gaya, and steppe zone spread to the hill which has the elementary school of Samanbaya Ashram from there, and a virgin forest of teak at the back of the hill which the elementary school of Samanbaya Ashram.

It is said that Asoka dynasty built 84,000 Buddha's ashes. They were made by bricks, therefore, this area lost all forest, and it is the hardest starvation area.

For, Asoka dynasty made bricks, iron, and pottery by cutting trees and burning it.

Therefore, the area of having lost forest became gravel because the out flow-of soil, also, the weathered rocks of the Deccan Hill is exposed as the gravel was washed away.

Therefore, the area at a distance of 50 km. along the shore of the Mohana Riv. becomes the steppe area. Especially when the water pressure of the Deccan Hill and the water pressure of the Himalayan Mts. become increase or decrease by the cycle of dryness and monsoon of the earth. Because the stratum is piled in the depth of 1,500 meters, the Ganges Riv. is absorbed into the stratum or overflows concentrically. Then, this area at the distance of 50 km. becomes the steppe area or the desert condition.

#### 4. The special condition

The farmers of the Aryan live in the Mahanadi Riv. near Buddha Gaya.

This farmers of the Aryan seize water rights of the steppe area to the hill which has the elementary school of Samanbaya Ashram.

Leaders of Samanbaya Ashram made a big tank in the steppe area to solve the problem of increasing population and poverty of Munda race( the lowest untouchable) lives in the edge of a hill which has the elementary school, and also to give the land to the Munda race, a serf, worked under the Aryan family by buying the steppe area from this elementary school to Buddha Gaya and by cultivating by helps of the Government.

4. To secure protein by keeping cattle and to make barnyard manure.
5. To enter the mixed barnyard with leaves of a back forest into the soil of the field.
6. To plant the pulse family and to sow a soybean if possible, and it will bring better soil by green manure and more kinds of food.
7. To plant trees according to the fundamental plan of "What is Green Revolution?" making irrigation. It is impossible for the landowner and the Government to against planting trees.

I taught the above plan and method and I made the people put into practice.

(The effects)

1. Water never dry up at any time in the first under the forest area. The second and the third one spread from the first one became possible to make irrigation to the hill of the elementary school and other hills. In spite of increase in the number of pupils, enough food could be secured.
2. If the well was dug at the depth of about 30 meters, water was through out the weathered rock bed of felspar and granite, so, water is clearer and better in quality than water of the tank.
3. The above soil improvement brought two crops a year, and a rice field became planting a rice plant and wheat, and a hill could produced abundant potatoes and wheat.

The above effect was remarkable, and especially, this area has an abundant harvest every year from the shore of the Mahanadhi Riv. and this area became possible to import aid from America and England.

The above matters which carried out for planting trees and irrigation has not complete yet, they have not solved enough yet, but the number of pupils of the elementary school has increased in one hundred pupils and a branch of the elementary school was made by the request of another village, and the number of the pupils was one hundred, then the number of pupils totaled 200.

I lived and worked with pupils of the elementary school on the above achievement, so the activity was very slow. And he founded the agricultural school near the school.

Also, Moringa tree was studied by Dr. Dogra, Scientist-in-Charge Tree Genetics Laboratory National Botanic Gardens Lucknow and the International Culture & Welfare Association, then, they have made a plan of planting this tree with the eucalyptus tree and they are at putting it into practice.

The above is the test case that carried out planting trees on the half desert and the steppe area on the foot of Mts. Himalaya and the edge of the Deccan Hill.

I.C.W.A. has guided the Indian people for about 10 years and the leaders' activity has led into such an achievement.

This result, however, has brought the remarkable effect and the achievement among Indian people, the result has not be sufficient, and also, the basic matter has not been taken shape correctly based on I.C.W.A.'s plan.

Here, it should be considered that there was much difficulty to carry out it according to the I.C.W.A.'s plan here after in case of planting trees on the desert and the steppe area.

#### (NOTE FOR REFERENCE)

1. Japan has no desert actually, so there was much unexpected difficulty on the steps on study and investigation about width, distance, and scale unconsiderable in the experiences and techniques and techniques of Japan, because India has the element of the continent though India is sub continent.

2. India was a quite different world from Japan in geological features and geographical features and the historical process of the earth.

It is rare to consider soil at the depth of more than 100 meters in Japan, however, India should be used a special idea and a method in case of agriculture and the others and in case of considering a fundamental structure, because some branches of the Ganges Riv. and the Indus Riv. stream at the depth of 1,000 to 1,500 meters and there is accumulated pile soil longer than the Japan Islands.

If the vast and long area is reduced and simplified fundamentally, the essentials and principles would be same, however, many elements are complicated and scale is very big, so we are apt to lose a way.

3. A thought of culture has existed as a common sense fundamentally. The Indian Culture and the China Culture are the greatest thing in the world. In some case, people has an absolute idea in the culture.

In case of India, I had a difficult problem which I must avoid the idea of the culture, and I must consider a way of living according to nature on the whole earth considering the earth connected with the way of living as man, climate and weather and natural power about India.

4. The resistances of the Indian people are very strong.

Especially, the Indian Culture is connected with the structure of the races and the society, the manners and customs have struck root on the circumstances for many thousand years, and it is very difficult to improve the culture or to reform it.

Especially, the upper class are proud of founding the Indian Culture in the world. They have no experience in practical work based on the earth and they can only use the lower class.

Here, they have an ideal world, and they have their own religion, philosophy, social structure, social idea, and manners and customs. They resisted this practical work absolutely.

5. The actual condition that the past culture has used the forest brought a lack of wood for agricultural tools and cooking to the native people.

The upper class exploited the lower class, and they have a function of plunder, so, they cannot understand the lower national life and the servant's difficult work.

Therefore, the lower class cannot afford to store crops or to cultivate it, so they can only plunder from the earth.

I lived and worked with pupils of the elementary school on the above achievement, so the activity was very slow. And he founded the agricultural school near the school.

In these social circumstances, the reformation of the earth will bring the social revolution, so, a big resistance will occur.

This circumstances exist not only in India, but also, between a town life and a rural life in the modern society.

6. The modern economic activity is centered on the city like a bank and the other economic function, and also, it has the economic activity centered on a heavy industry and a time limit, and it is rooted on the pursuit of profit. Therefore, this economic activity cannot carry out planting trees or agriculture, the reformation of soil because they take too much time, like ten years, twenty years to a hundred years.

7. The leadership and the function of the world are constituted with all the upper class.

In case of considering some problems of the world, there are some obstruction, that is, the artificial function brings the struggle of getting the leadership or keeping it. This function has no connection with the native people, and the leaders have no experience in a concrete work.

8. In case of solving the desert problem, the following problems have not been doubted or studied or examined till now; What kind of scientific data is, or the literature about the population of the town, the relation between the agriculture and the forest, and the relation between water and air and forest.

An animal cannot live without a plant.

The people has not awaked to this fact of the history of the earth, so, they have treated the modern environmental problem, the forest problem, the problem of planting trees as accessories. They have no consciousness of this problem as a condition of man's life and as a principle of the earth, and they have no preparation of knowledge.

It is a very difficult problem in this real condition that the U.N. and the Indian Government, and the Japan Gov. have rather no conscious of the desert problem that they cannot understand the fundamental problem in case of examination and study to put it in practice.

Here, I was confronted with the absolute difficulty in case of carrying out planting trees concretely on this desert and steppe area.

In this meaning, I found that the concrete experiment and the result which I carried out in India with the ability and the capital of I.C.W.A. and in cooperation with the volunteer of India have a limit.

I.C.W.A. has admitted many unsatisfactory things, but it has found that this report would be useful for showing a direction, a hope and a method in case of considering some problems of the modern society in the world.

The resistances of the Indian people are very strong.

Here, they have an idea that the resistance to any kind of改良, modernization and improvement of their culture and life is difficult to improve the culture or to know where a nation is.

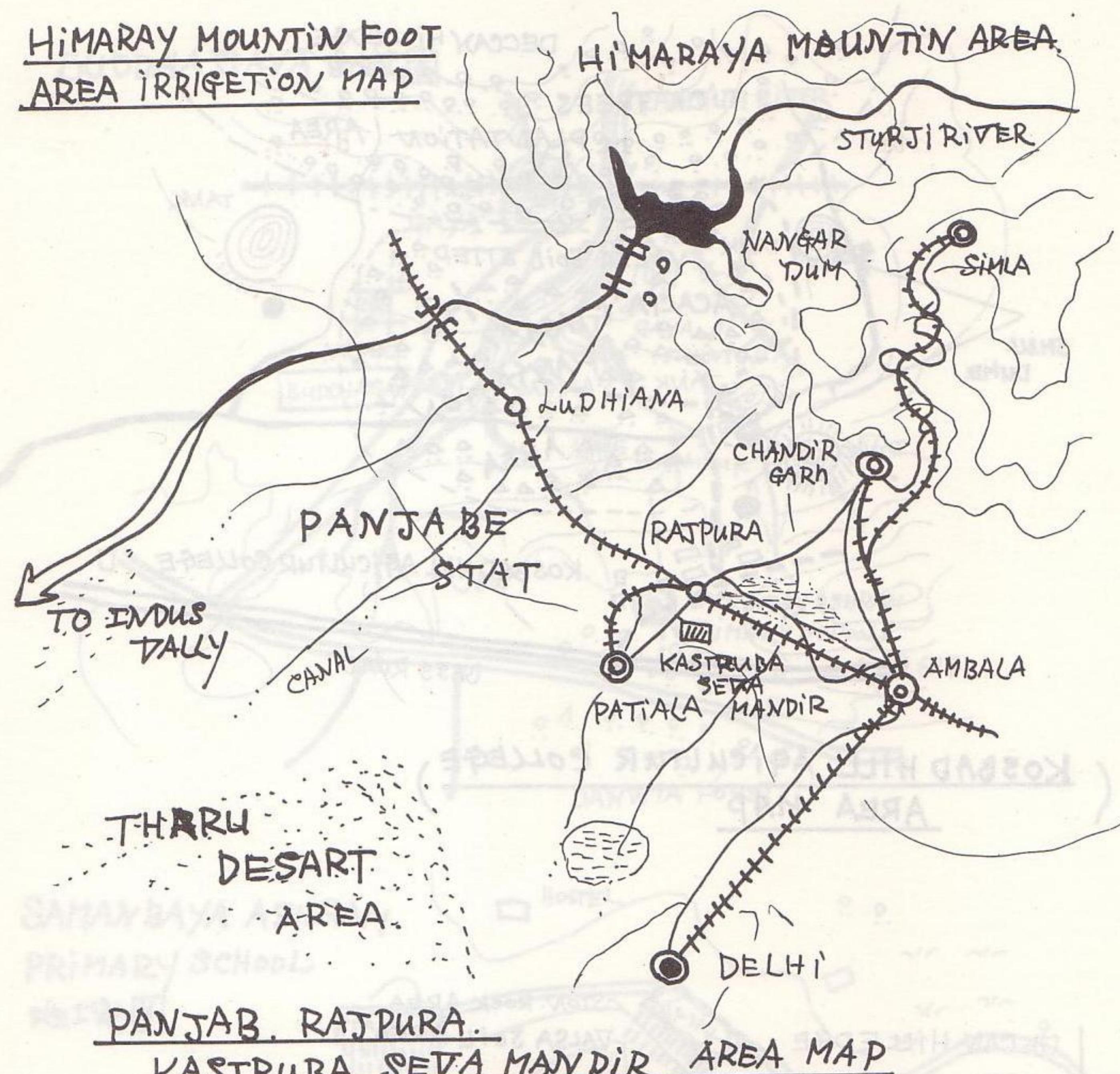
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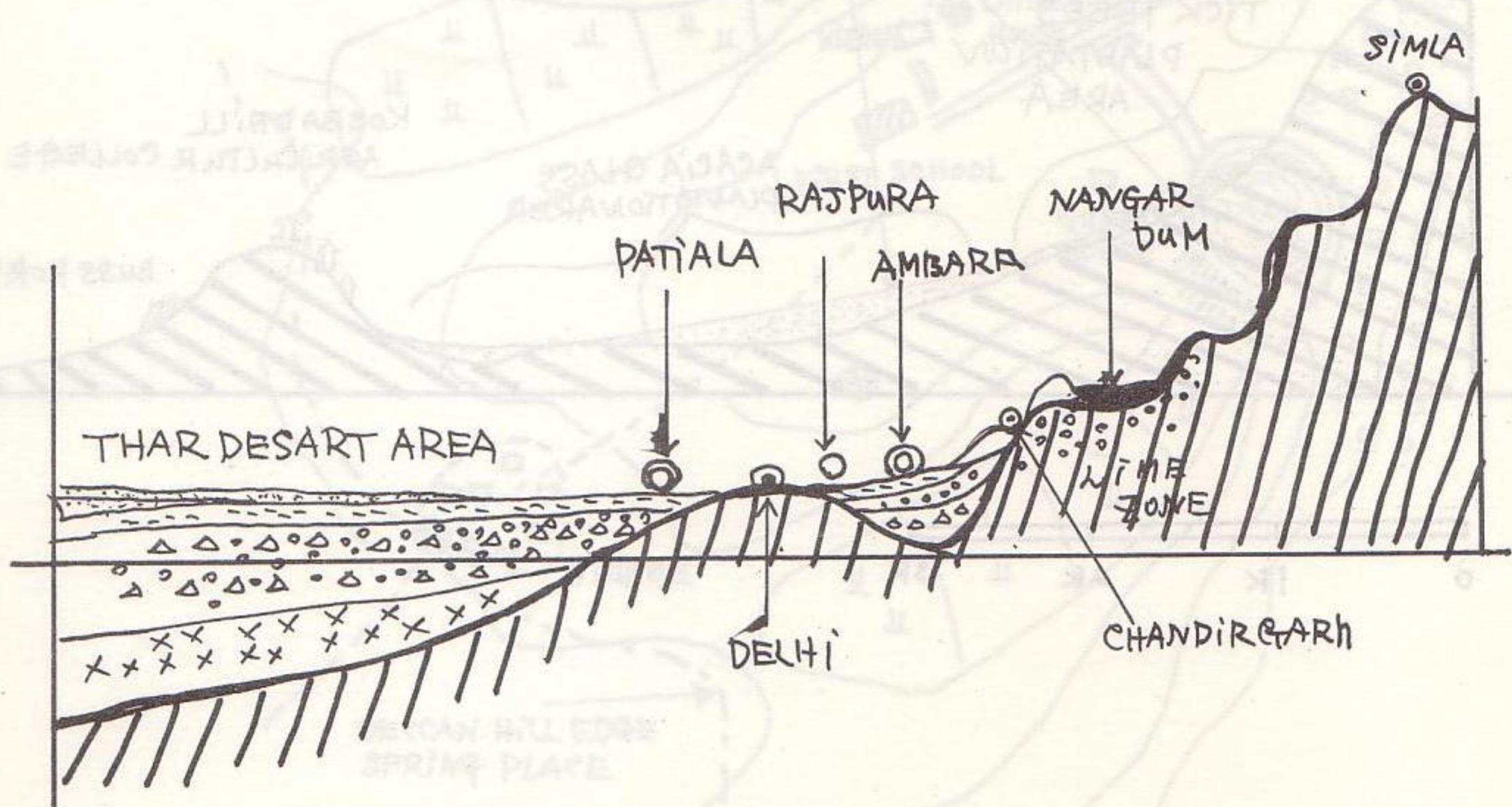
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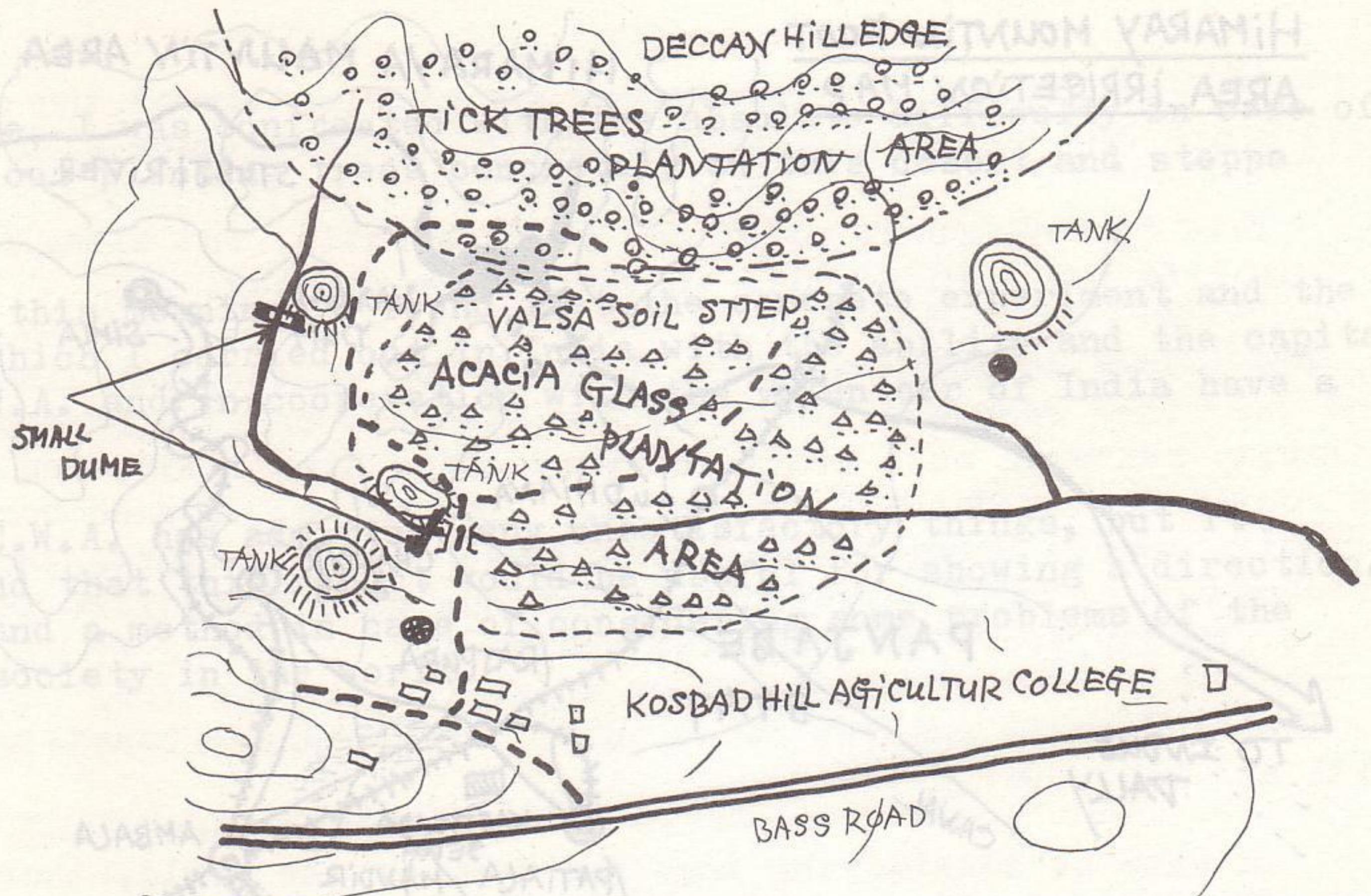
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HIMARAY MOUNTIN FOOT  
AREA IRRIGATION MAP

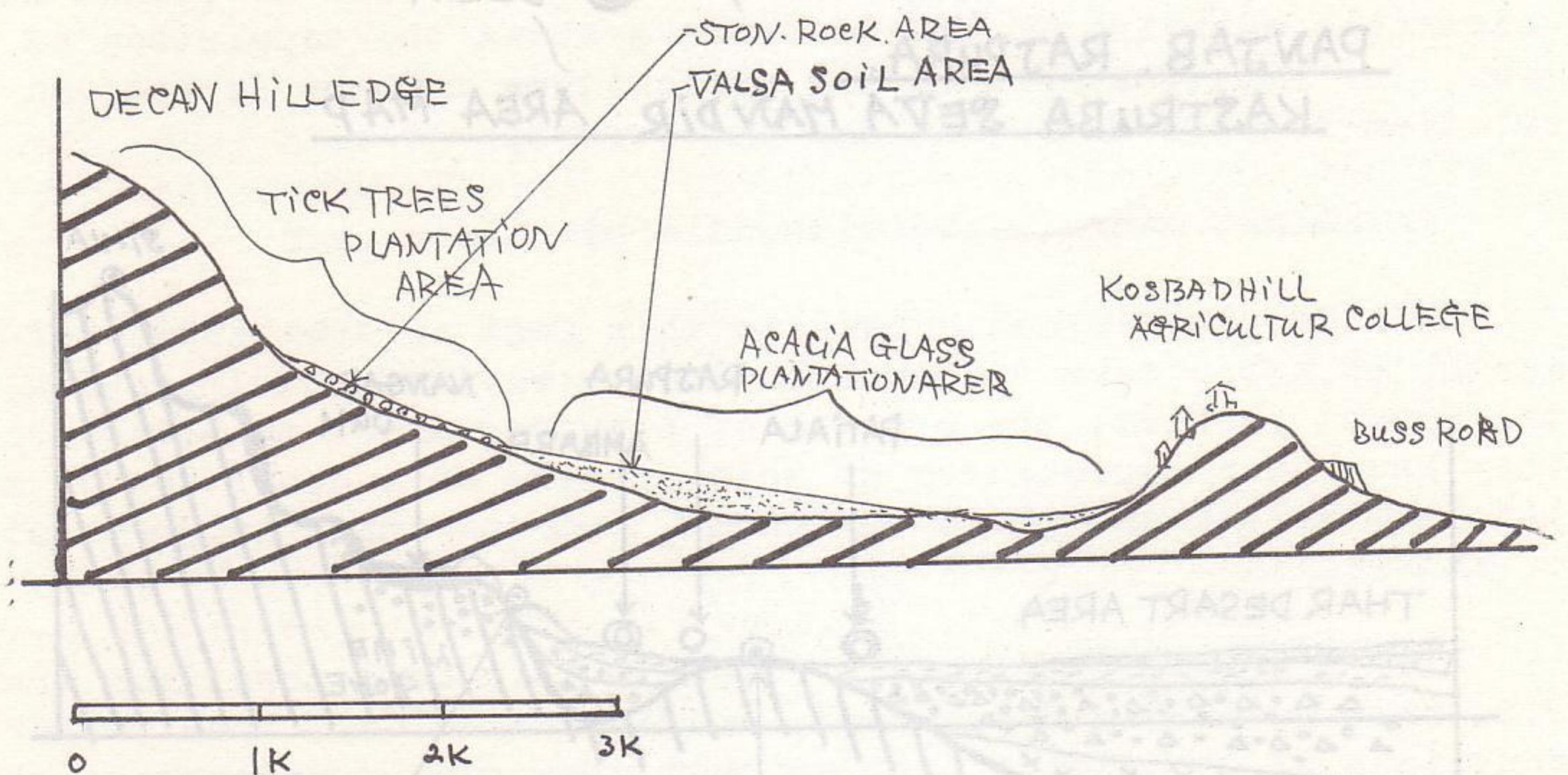


PANJAB. RAJPURA.  
KASTRUBA SETA MANDIR AREA MAP

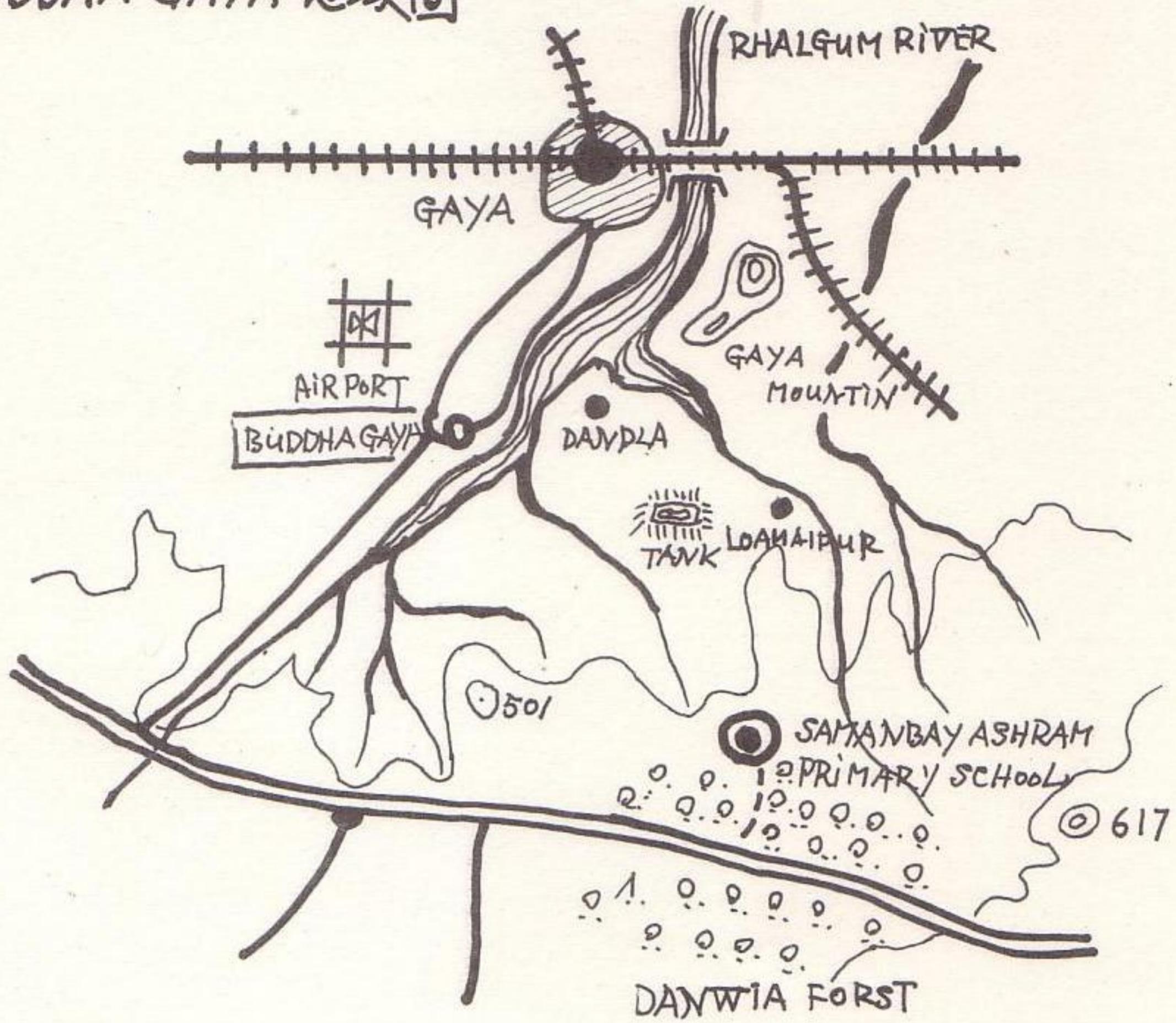




( KOSBAD HILL AGRICULTUR COLLEGE )  
AREA MAP )



BUDDHA GAYA 地域図



SAMANBAYA ASHRAM  
PRIMARY SCHOOL  
地域図

