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## Subsistent Economy of Tribal in undivided Koraput District in Pre-independent Era

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### **Abstract:**

*Undivided Koraput district of Odisha is full of natural beauty and a safe abode of several tribal communities known as adivasi. Since prehistoric days, the hill men are the aboriginal inhabitants of this pristine Highlands. Their religion, culture and everything revolved around forests, hills, rivers, streams and land. They identified themselves as the first settlers and inventor of rice varieties, a contribution to the mankind.*

*The socio-economic conditions in the Koraput highlands during the early part of the nineteenth century were particularly favourable to the persistence of a cooperative subsistent economy. Each narrow valley with terrace cultivation supported a small number of families, which depended on their own labour and catered to the for all the necessities and luxuries of life. Rice was grown in the beds of small streams which were terraced. Cultivation of different cereals, pulses, coarse grains and oil seeds on podu lands is one of the specialties of tribal agricultural practices. Agricultural production was supplemented by hunting and other activities related to a forest economy. The major occupation was slash and burn cultivation, Terrace cultivation and settled terrace cultivation which was practised on the hill slopes. The Bondas, Gadbas and Soaras are the pioneers of rice cultivation in this region. The prime objectives of this research article are to enlighten the economic patterns practised by the tribals of Koraput district and its impact on tribal society.*

**Keywords:** *Tribals, Slash and burn, Terrace cultivation, Settled terrace cultivation*

### **Introduction**

The tribal economy was on the whole based on collection of forest products. This was the primary livelihood sources of the tribal. A few tribes had the sole dependency on forest. There were also few

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tribes who preferred different rural based occupation like carpentry, masonry work, ironsmith, manual jobs etc. which was the supplementary economy for livelihood. Apart from that, animal husbandry and hunting were also additional occupations of the tribals. However, these economic activities were not enough for their subsistence. Therefore, they were doing new types of agriculture on the hill slopes and streams like slash and burn agriculture, terrace cultivation and settled terrace cultivation because there was paucity of plain land for cultivation. They produced major crops like paddy (rice) Black gram, Red gram (rahar) Horse gram, Maize, oat (mandia) Sesame, pulse and cereal etc and up keeping their families[1].

In tribal economy, the tribal women had played a significant role to help their husbands to earn additional income. The tribal males generally engaged themselves in agriculture, collection of forest products and hunting. Women's work started in early morning and continued till late night to do both domestic as well as field work with their husbands. Besides that, they were doing daily markets, selling goods and even collected forest products like plucking of Kendu leaves, Chahar, Jhuna etc. The girl children helped their mothers only in domestic chores. [2]

### Objectives of the Study

- The prime objectives of the research article are to highlight the tribal economy of undivided Koraput district in pre- independent era.
- To explore the agricultural patterns practised by the aboriginals.
- To study the ways and means of agricultural methods and pattern of crops produced by the tribals.
- To enlighten the impact of tribal economy.
- To study the soil conditions of slash and burn agriculture and others.
- To highlight the tribal economy that how far it was in subsistence level.

### Literature Survey

Ample of work has been done by the historians in this regard. J.K.Samal's "Orissa under British Crown" they have discussed the Land Revenue Administration and Political Turmoil of Odisha but he has not mentioned economic conditions of Koraput. The present research is perhaps the unique step in undertaking a macro study into the matter.

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Otto Wack's two books 'Church and Mission in India (1876-1914), Vol-I and 'Church and Mission: Mission (1914-1939)' Vol - II are the only biographies of the Missionaries and Christian way of life of Koraput. He has not mentioned in details about the economic aspects of Koraput district.

B.C.Padhi's 'Socio - Economic conditions of the Tribal under the British Rule (1803-1936)' refers to the social and political life of undivided Koraput District but he has mentioned little reference of economic pattern of Koraput.

Ajay Kumar Sahu's (ed), 'Aam Koraput' ( Our Koraput) – deals with various aspects of Koraput district like mines, forest, literature and culture but he hasn't mentioned economic, condition of Koraput in this volume. Therefore, attempted has been made to enlighten the uncovered parts of the writers about the history of Koraput. P.C. Mohapatra's, Economic Development of Tribal Orissa get reference of tribal ways of agriculture and collection of forest products but he has not given the full picture. A.K. Patnaik's, 'Socio-Religious, Political and Economics of Parajas of Koraput District' only highlighted the economic condition of Paraja but has not mentioned the other tribals' economic life. L.K. Mahapatra's, Shifting Cultivation in Orissa gives reference to tribal economy Koraput only. After thoroughly studied of the above books regarding the economic life of the tribals of Koraput, the scholar was tried to enlighten the uncovered part of the research work to the future researchers.

### Research Method

Both descriptive and library documentation methods have been adopted with analytical and historical perspective for the present study. The archival materials like the then journals, newspapers; letters, books, articles and internet archives and e-books etc. are considered for the research article. Adopting by these methods the scholar was able to get information about the conditions of economic, educational and health aspects for this research article.

### Result

The tribal economy was subsistence level. Family was the unit of production, consumption and pattern of labour. They used simple machinery for cultivation. For transaction of their products, sporadic markets were organized. The effects of tribal agriculture systems were deforestation, erosion of soil, and bio-diversity degradation. Forest was the epicenter for their livelihood and natural abode. Animal husbandry was their additional earnings. In spite of such economic activities, the tribals were leading the live which

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was miserable and deplorable till the coming of the Christian missionaries to this district and Indian Independence.

### Discussion

The fundamental traits of tribal economy were as mentioned below:

**(i) Forest based economy:**

The first and foremost trait of the tribal economy is the close rapport between their economic life and natural environment especially the forest. Tribals depend on forest for different timber and other forest products for their livelihood. The forest based supplements are the secondary livelihood of the tribals. A few tribes have the heavy dependency on forest. Mahua, Kendu, Kendu Leaves, Charaula (chahar) jangle root and Bamboo sots etc are all forest products

**(ii) Apart from forest products, there are different rural based occupation like carpenter, masonry work, iron work, doing manual jobs etc. which supplement to their economy.**

**(iii) Family - the unit of production, consumption and pattern of labour.**

Family, in the tribal economy is a unit of production. All the members of the family join hand to earn together. The whole family works for its livelihood. They also get the cooperation of other households. The pattern of labour in the tribal family is based on a well organized division of labour according to age and sex. The sex-wise division of labour is more prominent in them but, the male and female works according to their physical capacity. The boys and girls are allotted different jobs suited to their age. The grownups take part in all important and strenuous jobs whereas women are usually given light work.

The tribal male generally engaged themselves in agricultural work and collection of forest products and hunting. The husbands seldom shoulder the women's domestic chores. On the other hand, women's work starts early in the morning and continues till late night to do both domestic as well as field work with their husbands. Besides that, they do daily markets, selling goods, rearing cattle and even collected forest products like plucking of Kendu Leaves, Chahar, Mahua, Jhuna etc. The female children only help their mothers in domestic chores. In this way, women play prominent role in the tribal economy.

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**(iv) Simple Machinery:**

Exploitation of nature is carried out without any outside efficient technological aid. The implements and tools, used are indigenously produced and the latter are very crude in nature.

**(v) Sporadic Markets:**

Weekly, fortnightly or bi-weekly - locally known as Bazar or Hat etc. are widely spread in tribal areas of Odisha, In tribal areas, weekly markets play a significant role in the life of the people. The mode of transaction is barter for native goods i.e. goods produced in the region, like food grains, local hand-woven clothes, baskets etc. and cash for the non-native goods produced in the urban region or outside the region viz. salt, mill clothes, readymade clothes, cosmetics, soaps etc.

**The major agricultural patterns of tribals of undivided Koraput district are briefly discussed below:**

**1. Slash and Burn Agriculture:**

This district has mainly two types of agricultural practices- Slash and burn Cultivation or shifting cultivation and settled cultivation. Slash and burn practices is also known as shifting cultivation or simply Jhum or Podu cultivation. It is an ancient form of agriculture practised by the tribals of undivided Koraput district in pre – independent era. Slash and burn cultivation is adopted by tribals in the forests and hills. Usually a village community controls a certain measure of land consisting of mountains and valleys, and puts a small part of it every year under cultivation. Ploughs and cattle are not employed, but axes or bill-hooks and digging sticks are the only equipments used for the purpose. After winter, a portion of the hill-side or jungle is marked for cultivation. The vegetation is cleared by lopping off the undergrowth and branches of trees, which are allowed to dry in the sun for some times. The cleared area following slash and burn is also known as swidden.

Farmers take care that fire does not spread into the forest. Shortly before rain sets in the dry leaves and bushes burnt and the ash is used to provide nutrients to the soil. Fire kills the insects and the ash fertilises the ground. Then the farmers walk across the field with a digging stick or bill-hook in hand making holes in the ground and sowing seeds and covering it with earth by pressing it down with toes. As the rain falls the seeds begin to sprout and the harvest is gathered as each crop ripens.

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The land may thus be used for only one season or two, while in more crowded places, it may be used for three seasons and then left for a number of years to recuperate. The period of recovery may vary from three or four to ten years. It all depends upon the needs of the farmer and the pressure of the population in the locality. [3] For this reason, this type of agriculture is known as shifting cultivation.

It is a traditional method of harvesting crops that involve the rotation of several plots of land in a planting cycle. The farmer plants crops in a field for one or two seasons, and then lets the field lie fallow for several seasons. In the meantime, the farmer shifts to a field that has lain fallow for several years, and removes the vegetation by cutting it down and burning it. The ash from the burned vegetation adds another layer of nutrients to the soil. Slash and burn works best in low intensity agriculture. Paucity of plain and wet lands and natural conditions has resulted in shifting Cultivations. Cultivation of the earth after clearing is usually accomplished by hoe or digging stick and not by plough.

Of these farmers, many use a practice of **slash-and-burn** as one factor of their farming cycle. Others **employ land clearing** without any burning. Some of cultivators are purely **migratory** and do not use any cyclical method on a given plot. Sometimes no slashing at all is needed where regrowth is purely of grasses, an outcome not uncommon when soils are near exhaustion and need to lie fallow.

#### 1.a **Historical background of Slash and burn agriculture:**

This type of cultivation was not new to the tribals of undivided Koraput district. The wide variation in the agro-ecological conditions had led to the growth of a variety of ways of earning livelihood from the land resources such as nomadism, slash and burn cultivation and settled cultivation in ancient India, many of which are practised till date. Slash and burn or Jhum cultivation has been considered to be the most ancient, dating back to Neolithic period between the years 13000 to 3000 B.C. (F.A.O. Staff, 1957). According to Mahapatra (1994), "Shifting cultivation may be defined as impermanent cultivation on hill slopes, often steep, after cutting and burning the vegetation for cropping for two or at best three years, then the people move somewhere else to begin the cycle."

#### 1.b **Different names of Slash and burn cultivation:**

The practice of slash and burn cultivation has different names in different area. Locally it is called 'Podu Chasa'. In North Odisha, it is called 'Bringa', 'Dahi', and 'Kamana' by by the Bhuiyan. It is also called 'Jhum' in Assam, 'Pendo', 'Bawar' and 'Dohiya', in Madhya Pradesh, 'Kumari' in Tamil Nadu

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and so on[4] ‘Kurao and Khollu’ in Bihar, ‘Wales’ in Gujrat, ‘tekonglu’ in Nagaland, ‘adiabik’ in NEFA, Podu in the Deccan, Gudia, Podu, or dongar chas in South Odisha (Ganjam and Undivided Koraput district), Dahi in the district of Mayurbhanj, Odisha.

### 1.c History of Slash and Burn Agriculture:

Slash and burn is a method of agriculture primarily adopted by tribal communities for subsistence farming (farming to survive). Humans have practised this method for about 12,000 years, ever since the transition known as the Neolithic Revolution, the time when humans stopped hunting and gathering and started to stay put and grow crops. Today, between 200 and 500 million people, or up to 7% of the world’s population, use slash and burn agriculture.

### 1.d Traits and nature of Slash and Burn Agriculture:

Even though the crop types vary from location to location, the sequence of harvesting in slash and burn agriculture is almost similar around the world. Farmers begin to get ready a field by cutting down trees and vegetations in an area. Trees that bear fruits, nuts, building materials or other useful products are spared. The ground level vegetation or "slash" is allowed to dry until beginning of the rainiest part of the year, during which time the slash is burned converting biomass into nutrient-rich ash.

Burning also temporarily eliminates most pest and weed species. Seeds and cuts and saplings are planted directly into the ash-covered soil. Farmers may add additional slashed vegetation from offsite as mulch which further enhances soil fertility while protecting the soil from erosion. Mulch made from the cuttings of plants which contain natural insecticides such as *Piper nigrum* may also be used to protect crops from pest species. Fields may be weeded one or more times, but inevitably, weed and pest species take their toll on productivity. Depending upon location, fields may be cultivated for three to five years, and again, depending upon location, be allowed to recover for as little as five to over twenty years before being cut and burned again.

The tribes of Odisha have been practicing slash and burn agriculture since time immemorial and there are as many as 9 tribes, namely, the Koya, the Paroja, the Gadaba, the Bondo, the Didayi, the Kondh, the Saora, the Juanga, and the Bhuyan who eke out their subsistence chiefly through shifting cultivation. Broadly speaking every 14<sup>th</sup> among the tribals in the state is a shifting cultivator. The technique of shifting cultivation in Koraput evolves through 7 stages of operation such as-

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- i. selection of site
- ii. tree felling and bush clearing
- iii. firing
- iv. hoeing or ploughing
- v. sowing and dibbling
- vi. watching and
- vii. harvesting

#### 1.e Selection of Site:

Selection of proper site is made on a number of considerations i.e. fallow period, growth of wild plants to be slashed, proximity to the village, nature of slope etc. After a suitable area is selected for cultivation the jungle is cleared by felling the trees and chopping the undergrowth by using simple tools such as the axe and Dao and Gagada. Usually this operation starts from the month of January to March. The tribes of Odisha generally cut the trees high above the ground leaving stumps about 1 to 2 feet high. These stumps may also sprout at the second cutting. While cutting trees some important species which supply flowers, fruits, leaves, etc. are left out.

The Bhuyan and Juang of northern Odisha spare big trees which lie on the border line of the swidden for identifying the boundary of the plot. This practice is not followed among the Saora, and the Kondh of southern Odisha. Unlike the tribes of southern Odisha, the Juang, the Bhuyan of Bonai and Keonjhar keep some trees standing in the swidden. These trees are used to serve as bean-stalk.

The women are forbidden to take part in the jungle clearing among the Juang and the Bhuyan whereas there is no such restriction imposed on the Saora and other tribes of southern Odisha. When the felled trees, branches, and bushes are fully dried, they set fire to it towards the end of April or in May. The ash in the fields is scattered to fertilise the land. Manuring is not done or rarely done in slash and burn fields.

When the monsoon sets in during June, the tribals prepare the podu of shifting land for cultivation. After the first heavy shower the field is prepared with the help of hoes. A Juang of Odisha like the Baiga of M.P. uses a very primitive digging stick but the high landers of southern Odisha use a shouldered hoe. Plough is never used in these lands on steep hill slopes, but it is often used on hill land having moderate slopes as well as, the foot hills where land is comparatively flat. The land where people possess cattle, as



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in south Odisha, is ploughed, provided the slope is not steep or rocky. Saora of Ganjam use a pick with an iron blade and others use hoes for cultivating the soil. [5] Women also take part in the operation and sometimes they do it exclusively. The gentle hill slopes of Keonjhar facilitate ploughing and the tribes resort to it. Wherever ploughing is not possible, they use a hoe for digging the soil.

When land is ready seeds are sown mostly by broadcasting or dibbling. Small millets like Ganthi or Kosra, Swan, Kangu, Jahna or Johar and others like ragi, maize, jawar, oilseeds like niger and pulses like kandul, dongar rani etc. are sown broadcast, whereas seeds of pulses like red gram and black gram and of beans like Jhudanga and vegetables like Boitalu (pumpkin) are dibbled into the field. The major crops are paddy (rice) Black gram, red gram (rahar) horse gram, maize, oat (mandia) sesame, pulse, cereal, etc.

Slash and burn cultivation has very little scope for specialization, as diverse crops are sown in a single plot of land. Usually, mixed crops of hill paddy, other cereals, minor millets, and pulses are grown in slash and burn cultivation. Seeds of crops like ragi, Kandul, Ganthi, Kosra, Suan, Kangu, Jahna are mixed and broadcast on the field. Seeds of crops like Jhudanga and Baitalu (pumpkin) are dibbled between the sprouted plants. Certain crops like Niger and Maize are grown as pure crops (not mixed with others). Only maize fields are manured.

Referring to Slash and burn cultivation in Koraput district, the Partially Excluded Areas Committee Report mentions, “A particular crop is not grown in any one season as the growing of mixed crop is the rule rather than exception. [6]

A variety of grains are broadcast and beans are raised in their midst.... The dry crops generally grown on podu lands are Ragi, Red gram, Comba, Kharasa, Judungo and Bails (creepers), Kangu, Khosala, Horse gram, Caster, Summa and Korra”. Shifting cultivation involves essentially a mixed cropping system of cereals, pulses, oilseeds and vegetable. The diversity of crop ensure, conservation of precious minerals of the soil, captures solar energy through a perennial plant cover, and checks damages through pests and diseases. Multi-layered cropping with extensive root systems conserves the soil nutrients and the sequential harvesting of crops maximizes the use of space and their natural resources.

Cultivation of paddy in swiddens is not common feature among the tribes in different parts of state. It is more commonly grown in north Odisha whereas sparingly in south Odisha. At about 3000 ft heights in Malkangiri and some other places in Koraput and Ganjam hill rice is grown sparingly. In north Odisha,

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however, the Bhuyan raise dry rice in their Koman and Dahi fields, more than others. In Koraput area paddy is grown on podu lands on gentle slopes.

After one or two terms of rain the seeds germinate and the crops grow. The two operations of weeding and watching preceded harvesting. After 20 to 30 days the weeding operation starts. Generally women and children spend more time in weeding operations. It is the most strenuous and time consuming part of shifting cultivation. Without it they cannot expect to harvest anything from their field. The crops solely depend upon the monsoon. Apart from the occasional pests and diseases, there is fear of birds, rats and wild animals destroying the crops belt during day and night. Parrots, wild cocks, rats, bears, wild pig and boars sometimes destroy the crops. In order to save the crops from such animals, the slash and burn cultivators in many areas construct watch-houses.

The people generally play on a tin or drum from the tree-huts to ward off the wild animals and birds. Harvesting of crops starts in full swing from the month of October and continues till December or early part of January. In slash and burn cultivation generally there is a mixed farming with the harvesting of different crops being done as and when they mature. Sickle and hoes are used in cutting crops of different types.

All the members of family are engaged in harvesting. Male members are engaged in watching the field. The Bondas reap a small quantity every day just enough for a day's food, threshing it with their feet on verandah, husking, clearing, cooking and eating immediately. [7] Reaping a small quantity of crop everyday and eating the same immediately indicate the poor level of living and the primitive nature of economic performance of the tribals.

The Bondas Gadbas and Soaras are the pioneers of rice cultivation and it is a matter of great pride that the origin of about 2800 of paddy genetic resources in this plateau has been said to be one of the places indentified as secondary origin of rice in the world.[ 8]

The safe preservation of the produce is a major problem for the farmers. Paddy, millets, pulse and maize are preserved for future consumption. The cash crops like ginger, niger are disposed off. Vegetables like pumpkin that can be preserved for a longer period are kept either in the kitchen or in granary. Tuber crops are used for consumption or for sale.

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The crops which are grown in these fields vary from place to place. The yield of the jhum field is not entirely meant for self consumption.[9] He opines that the produce from the jhum fields is often meant for sale.

The money, they earn from these sale proceeds is spent on the purchase of cloth, iron, tobacco, salt, tea, sugar etc. Some crops like coarse paddy or millets are grown after the soil is partially exhausted and they are largely used by the farmers or his family.

#### 1.f The Benefits of Slash and Burn Cultivation:

In the areas with thick population and sufficient land, slash and burn agriculture has proved more sustainable and about as productive as more modern, energy-intensive agricultural methods. When done properly over a sufficiently large area, slash and burn agriculture results in a mosaic of agricultural, secondary (i.e., abandoned), and primary (i.e., relatively undisturbed) ecosystems that mimic more closely natural disturbance regimes than does mechanized, modern agriculture. For instance, slash and burn farmers typically plant or retain dozens of crop species in each field along with useful trees. In contrast, modern mechanized agriculture often results in large areas planted in a mono crop and requires the removal of almost all trees in order to use farm machinery. For the reason that, slash and burn fields typically incorporate many crop species and retain some tree species, slash and burn fields more closely mimic surrounding secondary and primary ecosystems in terms of both structure and diversity. Indeed, because farmers often incorporate useful trees into fields, slash and burn agriculture may be thought of as a form of agro forestry which because of increased diversity and physical structure has been shown to have characteristics conducive to biodiversity conservation.

#### 1.g Negative Aspects of Slash and Burn cultivation:

Many critics claim that slash and burn agriculture account to a number of reoccurring problems specific to the environment includes:

**a) Deforestation:** When practised by large populations, or when fields are not given sufficient time for revegetation there is a temporary or permanent loss of forest cover.

**b) Erosion:** When fields are slashed, burned and cultivated succession, roots and temporary water storages are lost and unable to preserve nutrients. The inevitable decline in productivity is a result of the

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depletion of soil nutrients and also a result of the invasion of weed and pest species. The two major problems of slash and burn agriculture are the use of fire to prepare fields for cultivation and the subsequent abandonment of those fields as productivity declines. Once abandoned, fields are allowed to return to natural state when native plants and tree species reclaim the field. The abandoned fields are used by humans as a source of fruits, nuts, fibers, medicinal plants, and game. When ecosystem recovery is fully ensured, the field may be used again for cultivation. However, in many cases, soil loss is so high that recovery time may be measured in millennia. So, it affects environment.

### c) Biodiversity Degradation:

When plots of land are cleared, the various plants and animals that live there are swept away. As a particular region suitable for a specific species, slashing and burning could result in extinction for that species. Because slash and burn agriculture is often practised in tropical regions where biodiversity is extremely high, endangerment and extinction may be magnified.

The negative aspects above are interrelated. It means one either follows or precedes the other. These issues may come about because of irresponsible practices of slash and burn agriculture by a large mass of people. Knowledge of the ecosystem of the area and agricultural skills could prove very helpful in the safe, sustainable use of slash and burn agriculture.

Besides that the slash and burn is considered devastating and disadvantageous as it not only causes harm to the eco system but also exerts negative impact on economy. It generally

- i) helps the springs to dry up.
- ii) results in soil erosion
- iii) destroys valuable timber
- iv) accounts to causing very heavy floods, and
- v) silts the tanks and fields and damages to crops.

### 1.h Slash and Burn Agriculture Today:

Slash and burn agriculture is particularly important throughout the tropics where, when done properly, it can provide people with a secure source of food and income and has been shown to be sustainable over long periods of time. Many critics point out that, when done inappropriately, slash and burn agriculture can quickly degrade large areas of forest which do not recover. This realization has led to a great

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difference in opinion between advocates and critics of the proper role, if any, of slash and burn agriculture in development. This difference in opinion may be explained by an examination of how slash and burn agriculture is being used today. Slash and burn agriculture has contributed to the rapid loss of forest cover because of the rapid increase in the number of people cutting and burning the forest in order to produce food for themselves and their families.

In addition, new settlers lack several key resources and skills needed to use slash and burn agriculture successfully includes:

- (1) Lack of detailed knowledge of local soils, climate, and ecosystems,
- (2) Lack of agricultural knowledge and skills
- (3) Lack of credit and technical support, and
- (4) Poor integration with local and regional economies.

To these problems may be added the issues of secure land tenure and access to sufficiently large areas in which to practice slash and burn agriculture. Settlers enter an area, clear the forest, cultivate crops for a short period of time, and then are forced to abandon their farms because they cannot produce enough food and income to support themselves. The result is that these settlers may be forced to sell their land to landowners, move on to another location and start over cutting and burning new forest lands.

### 1. i **The Future of Slash and Burn Agriculture:**

Slash and burn agriculture cannot cater to the growing need of the population taking place in many tropical countries. Instead, a great deal of emphasis has been placed on finding so called alternatives of slash and burn agriculture. These alternatives often focus on "poverty alleviation" providing jobs, income sources and social services. They discourage poor people to relocate to forested areas and used in slash and burn agriculture. Other alternatives include improving both the productivity and economic returns of land currently engaged in slash and burn agriculture instead of increasing the area under slashes and burn cultivation. A third alternative is to include more area under to modern, intensive agriculture and so as to grow sufficient food to feed growing populations.

### 2. **Terrace Cultivation:**

Another agricultural practice of undivided Koraput district is Terrace cultivation. A terrace is a piece of sloped plane that has been cut into a series of successively receding flat surfaces or platforms, which resemble steps, for the purposes of more effective farming. This type of landscaping, therefore, is

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called terracing. Graduated terrace steps are commonly used to farm on hilly or mountainous terrain. Terraced fields both decrease both erosion and surface runoff, and may be used to support growing crops that require irrigation, such as rice.

#### **i. Terrace farming- A Unique Agriculture Solution:**

It is a type of farming that was developed first by the Inca people and thereafter spread over other parts of the country. This method of farming uses "steps", called andens, which are built into the side of a mountain or hill. On each anden, various crops are planted, and when it rains, instead of washing away all of the nutrients in the soil, the nutrients are carried down to the next level. Additionally, these "steps" prevent a free flowing avalanche of water that would take plants with it and destroy all the crops on the hillside. This system also allowed them to build aqueducts, which carried water to each andens. The Incas built their aqueduct system so well that it is used till today. Though labour-intensive, the method has been employed effectively to maximize arable land area in variable terrains and to reduce soil erosion and water loss. In most cases the terrace is a low, flat ridge of earth built across the slope, with a channel for runoff water just above the ridge. Usually terraces are built on a slight grade so that the water caught in the channel moves slowly toward the terrace outlet. In areas where soils can take in water readily and rainfall is relatively low, level terraces may be used.

#### **3. Merits and Demerits of Terrace Cultivation:**

Terrace cultivation is an ancient technique for managing water runoff and soil erosion. Terrace cultivation, or terrace farming is one of the oldest types of land and water resource management for large-scale farming. Essentially, the main purpose of terrace farming is to reduce the velocity of water runoff and thereby soil erosion by breaking the length of the slope where that runoff is available. There are two main types of terracing, graded and level, and each with some advantages and disadvantages.

##### **3. i Merits:**

###### **a) Overflow rapidity:**

One of the principal advantages of terrace cultivation is that it can protect the terraced area's soil from overly rapid erosion. Erosion occurs when moving water strips away soil from the area over which it is flowing. Terracing, by reducing the length of the slope the water has to run over (i.e. by creating a level terrace on an otherwise sloped face), slows the flow of water. This protects the soil in the area from being carried away in a deluge.

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### b) Rainwater Collection:

Level terraces, like those found in parts of Bali and China not only reduces the rate of soil erosion but also traps and holds rainwater. This allows for the cultivation of water-intensive crops, such as rice, in these areas. Terracing creates flat spaces for crops and canals for water to flow between these areas. Water collected in the terraces can then be absorbed into the soil (if the soil is suitably permeable) and sustain crops.

### 3.ii Demerits:

One major disadvantage of terracing is rainwater saturation of the ground. This happens when terracing retains too much water, which is absorbed into the ground. The problem with ground saturation is that it can lead to water overflow during periods of heavy rains. This can end up causing more damaging runoff than in unterraced areas. Additionally, if not properly maintained, terraces can lead to greater soil erosion, often down slope from the terracing, than in non-terraced areas. Terracing requires huge inputs of labor to construct and maintain, and when not properly maintained, the effects can be catastrophic. Unmaintained terraces can lead to mudslides, the creation of deep gulley and increased soil erosion, particularly in sandy soils or on extremely steep terrains. Terracing also has been shown to reduce soil quality through the leaching of important nutrients from the soil in some areas. Since ancient times, farmers have built terraces to shore up a hillside, creating several levels of farms. In a small, seemingly inhospitable place, they can grow the crops they need to grow to survive.

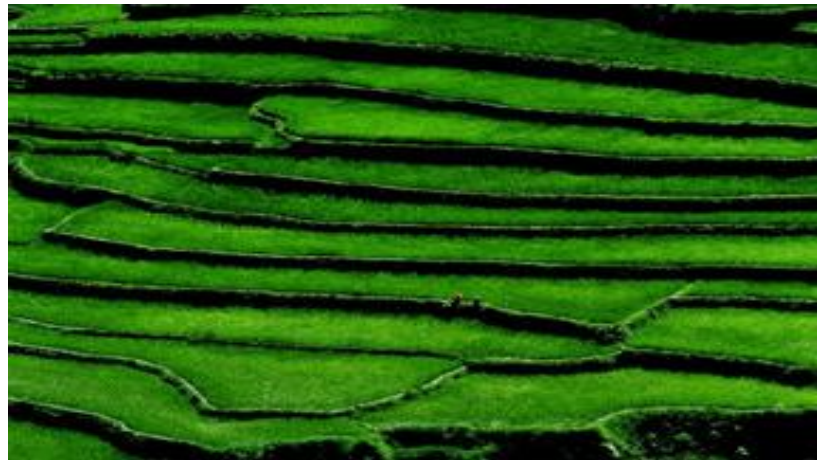


Here is a picture of an Inca hillside farm with "steps" The Incas created those "steps" using rocks and trees. From a steep slope they created many level plains, on which they could (and did) grow crops.

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Instead of flowing freely down the hillside, water stops on the level plain. In this way, the lower terraces are not eroded and, also, the higher terraces get enough water. On a straight, steep slope, water would tumble down the hillside, carrying crops and much-needed soil with it, letting nothing grow. The same sort of thing goes on today, in many places around the world.

One of the most prominent examples is in the rice field of Southeast Asia. Acres of land that look unusable contain terrace after terrace. Much of the rice that comes from Vietnam, Thailand, and other Southeast Asian countries is grown on terraces. Rice, especially, needs a lot of water to grow. The more flat areas existing on which to grow rice, the more rice people can grow. And with the terrace farming idea, water stays on the level surfaces, so rice grows in places that, on first glance, wouldn't necessarily look to be good farmland.



The more general question is this: Why don't people just move to places that have flat farmland. Well, some people can't afford to move. Others just don't want to. Still others have family all around and don't want to leave their parents, grandparents, or children. There are many reasons to stay in a place, even if you can't really afford to stay there.

So people who decide to stay in a particular place need to figure out a way to get their food. This is how terrace farming came about. And just like the Incas and other ancient peoples, today's terrace farmers get the most out of their land, in a way that might just have you scratching your head.



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#### 4. Settled Terrace Cultivation:

The settled cultivation is made in plains, plateaus and valleys of mountains or hill and rivers. The terraces are built right up to the beds of the hill streams and extended many hundreds of feet from the depth of the valleys to the hill slopes and in some places rising up to the hill tops. The terraces are works of great engineering skills of the Lanjia Saoras. The platform of each terrace is flat throughout and the fall of each terrace is so ingeniously and skillfully done that no soil is carried down with the waking that flows from higher terraces to the lower.

The water management is equally skillful. The flow of water from one terrace to the other is controlled by channels and water ways which are provided in the ridges of the terraces. The water management of the Lanjia is so skillful that it avoids flooding of the terraced fields. But in no case either the soil is carried over with water from the terraced fields or any damage is caused to the stone walls. As water is available throughout the year paddy is the only crop grown in the terraced fields. Two crops are harvested in a year. To varieties of paddy are grown in the terraced fields, the short duration paddy is grown during the summer season is known as Ambadhana and the long duration paddy grown in the Kharif is known as Badadhana.

#### Conclusion and Future Scope:

The undivided Koraput with its largest and highest hills is a splendid gift of nature which has been taken granted for by the history of mankind. An isolated section of civilization tribal in texture, obsolete in costume, orthodox in belief had flourished long before the flow of modernization. It stood erect and stable on an economic system which found its sustainability through slash and burn agriculture, terrace farming, settled cultivation, animal grazing, manual labour etc. The process of detribalization, equipped with modernity is undoubtedly divesting this Highland of its aboriginal beauty. It has set to grow wings to fly with the time. Still then the beauty of its traditional agriculture and its sustainable economic impact on the day to day life of the people persists on. Koraput may be heading towards a painful merge into the mainstream; its extant of today may relapse into a corner of human memory. In spite of this the legacy of farming Koraput has left for its progeny will remain alive inspiring more and more in the days to come. The subject is very wide and the scopes of research work for the future researchers are bright.

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