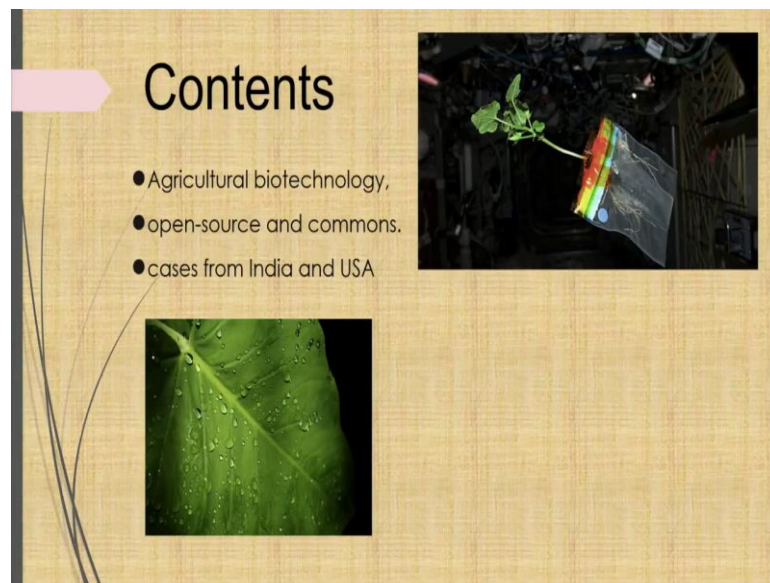


Sociology and Resource Management
Prof. Archana Patnaik
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Indian Institute of Technology, Kharagpur

Module - 02
Community control of natural and man-made resources
Lecture - 10
Agricultural biotechnology, open source and commons

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Today, we will be discussing Agricultural biotechnology, open source, and commons. And we will do so, by reflecting on cases from India and USA.

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Debates on agriculture

- Divided broadly into two groups:-
 1. Debates on technology transformation like the Green Revolution and Gene Revolution (which are done using biotechnology).
 - HYVs- use of synthetic fertilizers, chemical pesticides on a large scale was introduced
 - gene revolution - genetically modified seeds
 2. Debates on Intellectual property Rights – bio-piracy and monopoly to control the agricultural production process



When we talk about agriculture, the debate surrounding it can be divided into two broad categories; 1st, the debates on technological transformation like the green revolution and the gene revolution, which were done using biotechnology. Where, the green revolution by using high-yielding varieties changes was brought in the production process itself, like the use of synthetic fertilizers and pesticides were implemented on a large scale and it was only introduced during the green revolution period.

And the gene revolution was where using technology changes were brought within seed manufacturing to become genetically modified seeds. 2nd is the debate on intellectual property rights. Like the bio-piracy which we were discussing earlier and the monopoly, where patents were used to control agricultural production, which also we have discussed in the earlier module.

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Cases to be discussed

Practices of repossession and commonisation of seeds in India

- Analysing two grassroots non-governmental organisations (NGOs)
 - - Loka Samabaya Pratisthan (LSP) and
 - Sambhav (Odisha)

working to repossess seeds as commons.

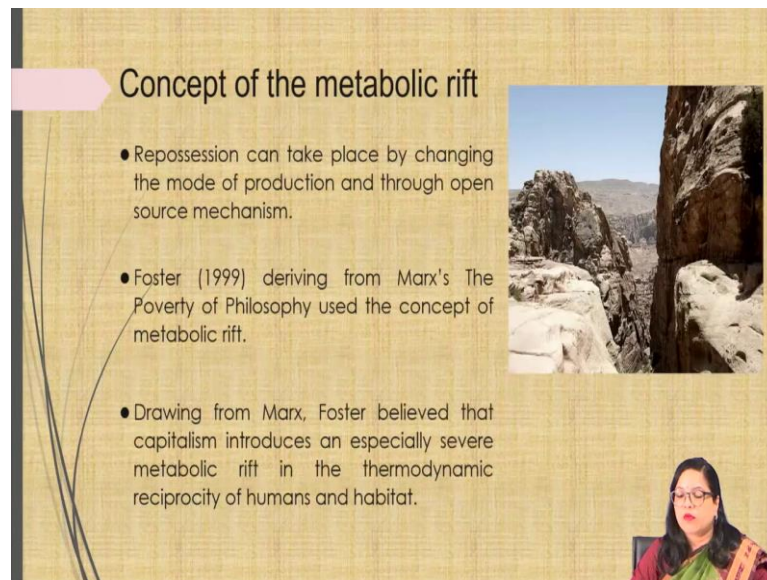
- Parallel practices of repossession through open source mechanisms.
- Analysis of the **Open Source Seed Initiative (OSSI)** in the USA and the **Open Source Seed System (OSSS)** of the Organic Farming Association of India (OFAI).

Video inset: A woman with glasses and a red and green sari is speaking.

In today's module, we will discuss the different practices of repossession and communication of seeds in India which are described in the article that analyses the two non-governmental organizations, the Loka Samabaya Pratisthana and the Sambhav. Both are based in the Eastern State of Odisha and working towards the repossession of seeds. This is an article that was published and written by me.



Further, parallel practices of repossession through open-source mechanisms. Analyzing the open-source seed initiative in the USA and the open-source seed system in the Indian context will also be reflected to give you an overall perspective.

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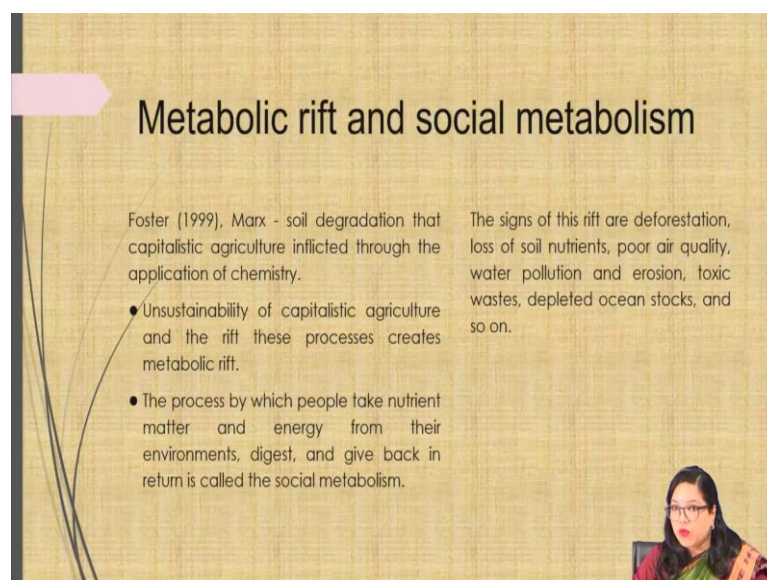
Concept of the metabolic rift

- Repossession can take place by changing the mode of production and through open source mechanism.
- Foster (1999) deriving from Marx's The Poverty of Philosophy used the concept of metabolic rift.
- Drawing from Marx, Foster believed that capitalism introduces an especially severe metabolic rift in the thermodynamic reciprocity of humans and habitat.



Repossession can take place by changing the mode of production and through open-source mechanisms. Foster derived from Marx's ideas like the poverty of philosophy using the concept of metabolic rift. Drawing from Marx, Foster believed that capitalism introduces an especially severe metabolic rift in the thermodynamic reciprocity of humans and the habitat.

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Metabolic rift and social metabolism

Foster (1999), Marx - soil degradation that capitalistic agriculture inflicted through the application of chemistry.

The signs of this rift are deforestation, loss of soil nutrients, poor air quality, water pollution and erosion, toxic wastes, depleted ocean stocks, and so on.

- Unsustainability of capitalistic agriculture and the rift these processes creates metabolic rift.
- The process by which people take nutrient matter and energy from their environments, digest, and give back in return is called the social metabolism.

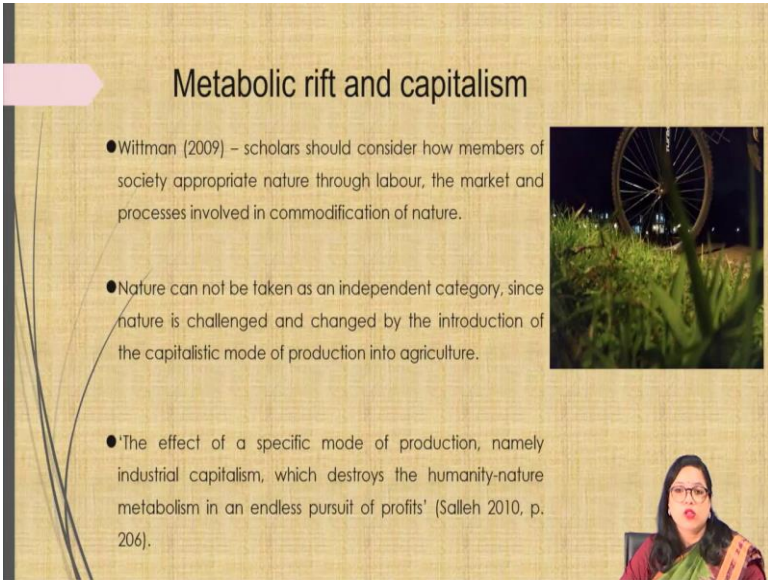


According to Foster, Marx there emphasized the condition of soil degradation that capitalistic agriculture inflicted through the application of chemical fertilizers. For him,

the unsustainability of capitalistic agriculture and the rift that the processes create also create the metabolic rift. The process by which people take the nutrient matter and energy from their environment, digest it, and give it back in return is called social metabolism.

Throughout history, some modes of production and forms of labour have been more disruptive of these material transfers than others. The sign of this rift is deforestation, loss of soil nutrients, poor air quality, water pollution and erosion, toxic waste, depleted ocean stock etcetera.

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Metabolic rift and capitalism

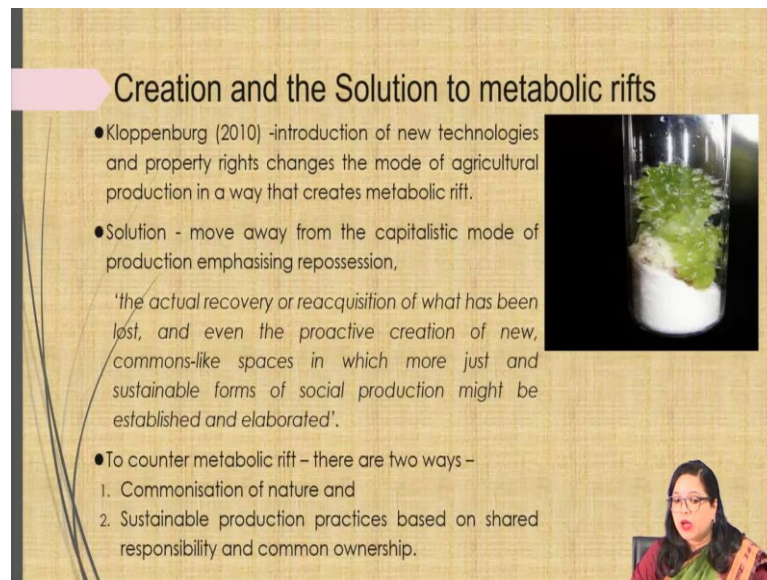
- Wittman (2009) – scholars should consider how members of society appropriate nature through labour, the market and processes involved in commodification of nature.
- Nature can not be taken as an independent category, since nature is challenged and changed by the introduction of the capitalistic mode of production into agriculture.
- The effect of a specific mode of production, namely industrial capitalism, which destroys the humanity-nature metabolism in an endless pursuit of profits' (Salleh 2010, p. 206).



To understand metabolic rift according to Wittman, scholars should consider how members of society appropriate through labour, the market, and the processes involved in the commodification of nature. Thus, nature cannot be taken as an independent category since nature is challenged and changed by the introduction of the capitalistic mode of production into agriculture.

The metabolic rift is thus comprehended as the effect of a specified mode of production, namely industrial capitalism, which destroys the human-nature metabolism in an endless pursuit of profit. And this was described by Salleh.

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Creation and the Solution to metabolic rifts

- Kloppenburg (2010) - introduction of new technologies and property rights changes the mode of agricultural production in a way that creates metabolic rift.
- Solution - move away from the capitalistic mode of production emphasizing repossession,
'the actual recovery or reacquisition of what has been lost, and even the proactive creation of new, commons-like spaces in which more just and sustainable forms of social production might be established and elaborated'.
- To counter metabolic rift – there are two ways –
 1. Commonisation of nature and
 2. Sustainable production practices based on shared responsibility and common ownership.

(Note: The slide includes a small inset image of a green plant growing in a glass container with white soil, and a small video feed of a woman in the bottom right corner.)

Kloppenbug emphasized how the introduction of new technologies and property rights changes the mode of agricultural production in a way that creates a metabolic rift. Kloppenburg’s solution to this, therefore, was to move away from the capitalistic mode of production emphasizing repossession.

Which according to him is the actual recovery or the reacquisition of what has been lost, and even the proactive creation of new common-like spaces in which more than just and sustainable forms of social production might be established and elaborated. To counter the metabolic rift then there are two ways, one is the commodification of nature and sustainable production practices based on shared responsibility and common ownership.



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Repossession

- Repossession - strategy that returns what was possessed by an individual or group or institution into the domain of commons along with (re)introducing metabolic fit.
- Thus, when we discuss appropriation in the field of agriculture we also find practices that can reverse it by introducing certain mechanisms.

Case 1

Loka Samabaya Pratisthan, a NGO that reacted against the technological development inscribed in the High Yielding Varieties (HYVs) perceived as destroying the ecological system.



Repossession, then not only operates as a strategy that returns what was once possessed by an individual or a group or an institution into the domain of commons but also reintroduces in that case the metabolic fit. Thus, when we discuss appropriation in the field of agriculture, we also find practices that can reverse it by introducing certain mechanisms.

To provide you with cases, I will first reflect on *Loka Samabaya Pratisthana*, NGO that reacted against the technological development inscribed in the high-yielding varieties perceived as destroying the ecological system.

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Conserving seeds and re-engagement with traditional agricultural practices

- LSP - organizational seed banks situated at different places in Nariso village, Odisha where traditional varieties of seeds are conserved.
- Ecological damage was recognised that pesticides do to people and ecosystems.
- Cultivation of high yielding required pesticide and fertilizer applications – creating ecological losses.

LSP has organizational seed banks which are situated at different places in small rooms in various farm outbuildings, huts, and houses in Narciso village, Odisha, where traditional varieties of seeds are conserved. For LSP, the ecological damage that the pesticide does to people and the ecosystem was the major factor impaling a return to the practice of conserving seeds and re-engaging with traditional agricultural practices.

The cultivation of high-yielding varieties requires a high amount of pesticide and fertilizer application, which creates ecological losses. Thus, it was the ecological losses caused by the cultivation of the high-yielding varieties that led the LSPs founder Mister Natwar Sarangi to look for alternatives or alternative means of doing agriculture.

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Metabolic rifts between nature and society

The use of improved varieties was seen as creating a metabolic rift between nature and society

Sarangi looked for closure to this rift

Natural farming and adopting ecological ways of doing agriculture.

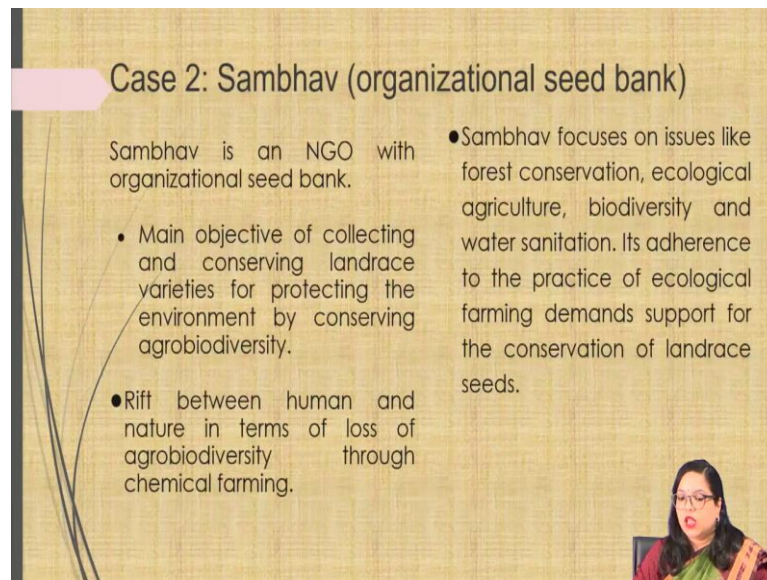
1. Use landrace varieties,
2. Organic farming -Introduced natural inputs, like neem cakes, as pesticides and cow dung as manure.
3. This collection and expansion through informal networking was to become the LSP strategy

The use of improved variety was seen as creating the metabolic rift between nature and society through the use of chemical fertilizers and pesticides required by the new varieties. Sarangi looked for closure of this rift through natural farming and adopting ecological ways of doing agriculture.

He found that the main requirement was to use the land resist varieties, which do not need intensive pesticides and can be cultivated using natural inputs, puts as neem cakes as pesticides and cow dung as the manure. And inspired by the ethos of organic farming, began looking out for the landrace's varieties in the nearby areas and then saving and storing them in their organizational seed banks.

Motivated to challenge the institutional practices of the high-yielding varieties, Sarangi started by collecting and sharing landraces varieties with interested farmers; then, over some time, he was able to appoint a few people to collect the landraces varieties, using their informal networks first from different villages and then from different states. The collection and expansion through informal networking were to become the LSP strategy.

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Case 2: Sambhav (organizational seed bank)

Sambhav is an NGO with organizational seed bank.

- Main objective of collecting and conserving landrace varieties for protecting the environment by conserving agrobiodiversity.
- Rift between human and nature in terms of loss of agrobiodiversity through chemical farming.
- Sambhav focuses on issues like forest conservation, ecological agriculture, biodiversity and water sanitation. Its adherence to the practice of ecological farming demands support for the conservation of landrace seeds.



The second case from India is of Sambhav. Sambhav is an NGO with an organizational seed bank with the major objective of collecting and conserving landraces varieties for protecting the environment by conserving agro-biodiversity. Sambhav's founders visualize the rift between humans and nature in terms of the loss of agro-biodiversity through chemical farming. Sambhav focuses on issues of forest conservation, ecological agriculture, biodiversity, and water sanitation.

It adheres to the practices of ecological farming which demands to support for the conservation of the landraces varieties. Sambhav collected the seeds which are now stored at Sambhav's organizational seed bank to bring more and more seeds to the organization and ultimately to the farmers.

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Case 2: Sambhav (organizational seed bank)

- The members of Sambhav collected seeds from wherever they could, which now means from all over India.
- Thus collecting landrace variety seeds, Sambhav gradually became able to challenge the use of HYVs.
- Urge to reconnect resources (landrace seeds) with the farmers through conservation and sharing by both the NGOs as a tool to counter the metabolic rift created by HYV cultivation and the associated agro-biodiversity loss.





The members of Sambhav collected seeds from wherever they could and whichever means they could from all over India. Thus, by collecting landrace variety seeds Sambhav gradually became able to challenge or change the use of high-yielding varieties. This informal networking served as an important means of collecting and sharing traditional varieties for use locally and beyond instead of seeds or the high-yielding varieties developed through public institutions with international collaboration.

Here, we find the usage to reconnect resources like the landraces seeds with the farmers through conservation and sharing by both the NGOs as a tool counted the metabolic rift created by the high-yielding cultivation and the association with the agro-biodiversity loss.

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Protection of agro-biodiversity and repossession

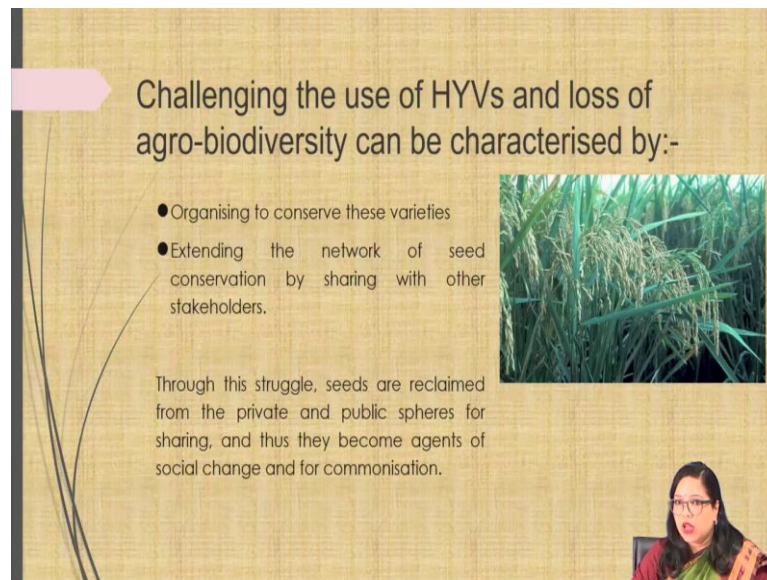
- Protection of agro-biodiversity
- Act of repossession where the increased use of landrace varieties by farmers enables them to reclaim their control over the resources (seeds).
- Freedom for farming communities
- This transformative role cannot develop unless seeds sharing and the practice of conserving and cultivating the landrace varieties spreads across different regions.
- The informal seed networks through which LSP and Sambhav share seeds are thus a vital aspect in their activation as agents of social transformation.



The objective of LSP and Sambhav in collecting different varieties to enrich the seed collection and protect agro-biodiversity also leads to an act of repossession, where the increase in the use of landrace varieties by the farmers enables them to reclaim or reclaim their control over the resources that is the seed.

This returns to the farmer, the farming community of freedom that they had lost earlier and even extends it through the varieties that grow well locally. This transformative role cannot develop unless the seeds are shared and the practice of conserving and cultivating the landrace varieties spread across different regions. The informal seed networks through which LSP and Sambhav share seeds are thus a vital aspect of their activation as agents of social transformation.


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Challenging the use of HYVs and loss of agro-biodiversity can be characterised by:-

- Organising to conserve these varieties
- Extending the network of seed conservation by sharing with other stakeholders.

Through this struggle, seeds are reclaimed from the private and public spheres for sharing, and thus they become agents of social change and for commonisation.



Summarizing the struggle of both the NGOs challenging the use of high-yielding varieties and the loss of agro-biodiversity, it can be characterized into two types. First is finding materials that are the landraces varieties. And second is organizing to conserve these varieties, like within their organizational seed banks.

Extending the network of seed conservation by sharing with another stakeholder through these struggles, seeds are reclaimed from the private and the public sphere for sharing, and thus they become agents of social change and the commonisation.

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Open Source Seed Initiative (OSSI), USA and Open Source Seed System (OSSS), India

- The open source movement gradually made its way to the agricultural sector.
- Any project needs to possess a certain set of characteristics to qualify as an open source project. Some of the characteristics are:
 - (a) Full disclosure of data or information including the documented source code – This ensures the sharing of data or information.
 - (b) Use of legal instruments (copyleft license) – This ensures permissive rights to the users of the shared data or information as well as confer some responsibilities on the users of the shared data or information.
 - (c) Creating commons – Here a set of resources which are shared remain accessible to all



Now, let us discuss cases on open source that is open source seed initiative of the United States and open-source seed system that is based in the Indian context. The open-source movement gradually made its way into the agricultural sector. Any project needs to possess certain characteristics to qualify as an open-source project. Among them, some of them are full disclosure of the data or information including the documented source code. This ensures the sharing of data or information

Use of legal instrument, that is a copyleft license. This ensures permissive rights to the users of the shared data or information as well as confers some responsibilities on the users of the shared data or information. And the third, creating commons, here a set of resources that are shared and remain accessible to all.

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The slide features a title 'Open source agriculture' at the top center. To the right is a green logo of a plant with leaves and circular nodes. The main content consists of three bullet points: 'Restoration than a revolution' (Boettiger and Wright 2006, p. 45), 'The open source tool encouraged and rewarded sharing in agriculture through open source license', and 'Preserve rights of the users as opposed to the restrictive rights provided by the intellectual property rights (Kloppenborg, 2014)'. Below these is an 'Examples' section mentioning the Open Source Seed Initiative (OSSI) and Open Source Seed System (OSSS), followed by a description of an indirect approach aimed at repossessing seeds from restrictive intellectual property rights by use of open source license. A small inset image of a woman is visible in the bottom right corner of the slide.

Open source agriculture

- 'Restoration than a revolution' (Boettiger and Wright 2006, p. 45).
- The open source tool encouraged and rewarded sharing in agriculture through open source license
- Preserve rights of the users as opposed to the restrictive rights provided by the intellectual property rights (Kloppenborg, 2014).

Examples: The Open Source Seed Initiative (OSSI) and Open Source Seed System (OSSS)

Indirect approach aimed at repossessing seeds from restrictive intellectual property rights by use of open source license.


Open-source agriculture is more of a restoration than a revolution, as agriculture always develops on sharing and exchange of seeds and materials. This was according to Boettiger and Wright. The open-source tool thus encouraged and rewarded the sharing in agriculture through open-source licenses to preserve the rights of the users as opposed to the restrictive rights that were provided by the intellectual property rights. According to Kloppenborg.

The open source seed initiative and the open source seed system are examples of these indirect approaches aimed at repossessing seeds from the restrictive intellectual property rights by use of the open source license.

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The Open Source Seed Initiative (OSSI)

- Repossession of seeds by denying the corporate dominance created by intellectual property laws.
- In contrast to the closed system of IPRs, OSSI seeds remain as protected commons for further use.
- OSSI uses laws and gaps in the current IPRs system to approach working through legal rights by using a licensing system that broadens the horizon of access and sharing, like that of open source software (OSS).
- Thus, repossession for OSSI challenges restrictive institutional arrangements, such as that of the IPRs.




The open-source seed initiative of the USA aims at the repossession of seeds by denying the corporate dominance created by intellectual property laws. In contrast to the closed system of intellectual property rights, OSSI seeds remain a protected common for further use. OSSI also uses laws and gaps in the current IPRs system to approach its goal indirectly working through the legal rights by using a licensed system that broadens the horizon of access and sharing.

Like that of the open-source software, we discussed earlier. The repossession of the open source system, thus the repossession of the open source seed initiative challenges the restrictive institutional arrangements, such as that of intellectual property rights.

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The Open Source Seed Initiative (OSSI)

- OSSI is primarily motivated to employ mechanisms to use plant material for the goal of breeding.
- OSSI in its approach to repossession creates networks of individuals and organisations that adhere to the common goal of denying monopoly of private companies through IPRs in agriculture defending their autonomy in breeding processes.
- The reach of OSSI and the target group(s) - functions to caters to the needs of farmers as well as plant breeders.
- Seed industries can also be one potential user - introduces the possibility of monopoly in terms of collecting royalties



OSSI is primarily motivated to employ mechanisms to use the plant material for the goal of breeding. OSSI in its approach to repossession creates networks of individuals and organizations that adhere to the common goal of denying the monopoly of private companies through intellectual property rights in agriculture defending their autonomy in the breeding process.

The reach of OSSI and the target groups are still not fully established, though it does function in a way that caters to the need of the farmers as well as the plant breeders. However, seed industries can also be one potential user which again introduces the possibility of monopoly in terms of collecting royalties.

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Open Source Seed System in India

- India- genetic modification is considered a potential threat to the freedom and autonomy of farmers.
- Initiatives like OSSI may be regarded as contradictory to the goals of grassroots organisations in India.
- On 30-31 August 2014, OFAI workshop - dismantling the industrial monopoly of seeds through the introduction and development of an Open Source Seed System in India.
- A reaction to the introduction of IPRs, particularly addressing the drawbacks of the Indian Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act and Biological Diversity Act (BDA).

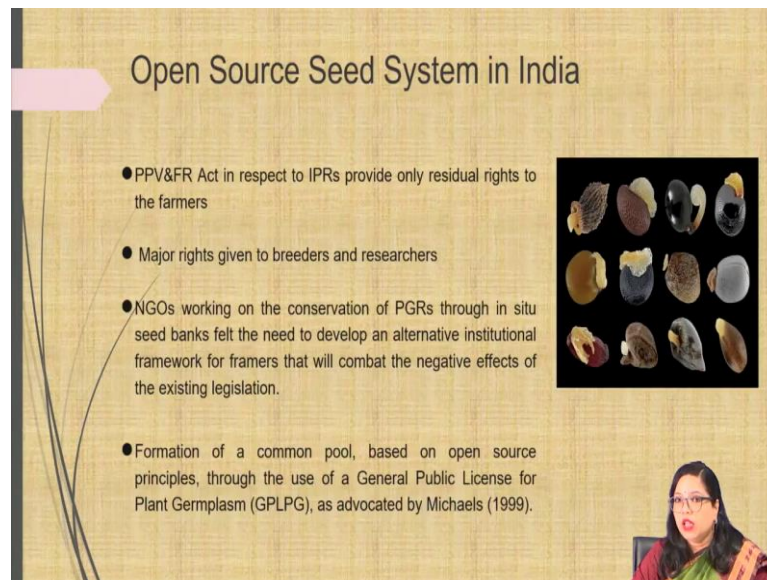
The slide includes a photograph of several wooden trays containing different types of seeds, such as white, brown, and red seeds. In the bottom right corner, there is a small inset image of a woman with glasses, wearing a green and orange sari, who appears to be presenting the slide.

In India, the introduction of new technologies like genetic modification is visualized as a potential threat to the freedom and autonomy of farmers. Initiatives like OSSI which do not restrict the derivative use of the resource under the protected commons and its application in agriculture including genetic modification may be regarded as contradictory to the goals of the grassroots organizations in the Indian context.

From 30 to 31st of August 2014, the Organic Farming Association of India organized a workshop aimed at finding ways to go about dismantling the industrial monopoly of seeds through the introduction and development of an open-source seed system in India.

The initiative developed the open source seed system in India occurred as a reaction to the introduction of intellectual property rights, particularly addressing the drawbacks of the Indian protection of Plant Varieties and Farmer's Rights Act, and the Biological Diversity Act.

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The slide features a title 'Open Source Seed System in India' at the top. Below the title is a list of four bullet points. To the right of the text is a photograph of various seeds. In the bottom right corner, there is a small inset image of a woman speaking.

Open Source Seed System in India

- PPV&FR Act in respect to IPRs provide only residual rights to the farmers
- Major rights given to breeders and researchers
- NGOs working on the conservation of PGRs through in situ seed banks felt the need to develop an alternative institutional framework for farmers that will combat the negative effects of the existing legislation.
- Formation of a common pool, based on open source principles, through the use of a General Public License for Plant Germplasm (GPLPG), as advocated by Michaels (1999).

According to the CSA report, the provision of the PPV and FR Act concerning intellectual property rights provides only residual rights to the farmers concentrating the major rights on the breeders and the researchers, which the open source seed system aims to address by broadening the privileges of the farmers.

Various NGOs working on the conservation of plant genetic resources through the in-situ seed banks felt the need of developing an alternative institutional framework for the farmers that will combat the negative effects of the existing legislation. Thus, the organic farming association of India's conception of an open-source seed system included the formation of a common pool, based on the open-source principle through the use of the General Public License of the Plant Germplasm that GPLPG, as was advocated by Michaels in 1999.

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Open Source Seed System in India

- Relies on the GPLPG for sharing of and access to seeds.
- The General Public License (GPL) does not require new legal institutions as it operates through the Material Transfer Agreement (MTA) which is well established in India.
- OSSSI is based on the principle of open source with a royalty bearing licence which is developed under OSSSI.





The open-source seed system does not develop a license of its own, but rather relies on the GPLPG for sharing access to seeds. According to the CSA report, the general public license does not require a new legal institution as it operates through the material transfer agreement which is well established in the Indian context.

OSSI by contrast is based on the principle of open source with a royalty-bearing license which is developed under the OSSSI. These differences in the choices of OSSSI and OSSSS can be seen as a reflection of their socio-political context.

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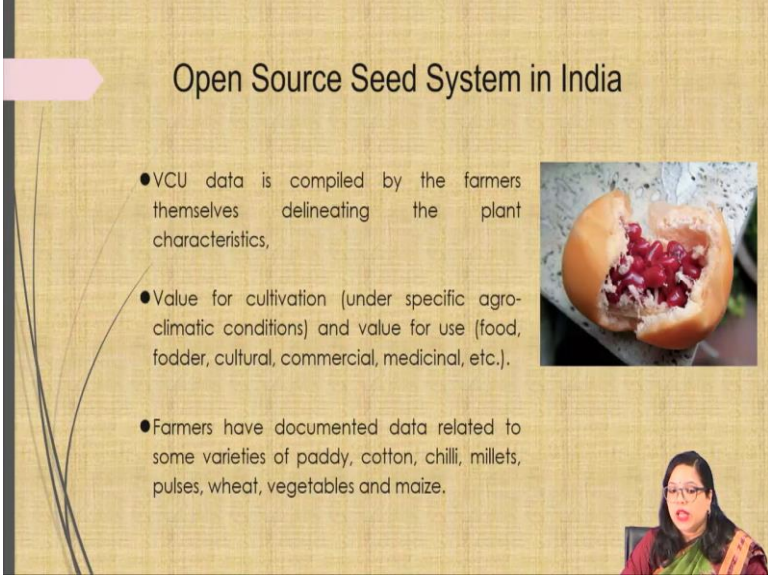
Open Source Seed System in India

- These differences in the choices of OSSSI and OSSSS can be seen as a reflection of their socio-political positioning.
- One important difference between OSSSI and OSSSS is that the OSSSS aims at developing a Value for Cultivation and Use (VCU) data of seeds under the OSSSS, which is absent in OSSSI.



One of the important differences between the open source seed initiative and the open source seed system is that the open source seed system aims at developing a value for cultivation and use which is known as VCU, data for seeds under the open source seed system, which is absent in case of open source seed initiative.

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The slide features a light brown textured background. At the top center, the title 'Open Source Seed System in India' is displayed in a dark font. To the left of the title is a pink arrow pointing right. Below the title, there are three bullet points. To the right of the text is a small image of a cut papaya showing its red seeds. In the bottom right corner, there is a small inset video of a woman with glasses speaking.

Open Source Seed System in India

- VCU data is compiled by the farmers themselves delineating the plant characteristics,
- Value for cultivation (under specific agro-climatic conditions) and value for use (food, fodder, cultural, commercial, medicinal, etc.),
- Farmers have documented data related to some varieties of paddy, cotton, chilli, millets, pulses, wheat, vegetables and maize.

VCU data is compiled by the farmers themselves delineating the plant characteristics, value for utilization value for cultivation under specific agro-climatic conditions, and value for use like food, fodder, cultural, commercial, medicinal etcetera. The farmers have documented data related to some varieties of paddy, cotton, chili, millets, pulses, wheat, and maize in this regard.

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Implementation of OSSS in India

- This attempt of OSSS also connects the varieties with the farmers and their knowledge.
- Provide data to the farmers to help decide which variety to choose over the other for cultivation and breeding purposes.
- For the implementation of OSSS in India the CSA report advocated the development of open source principles through a seed network called the Open Source Seed Network (OSSN).





This attempt at an open-source seed system also connects the varieties with the farmers and their knowledge. Further, providing data to the farmers can help them in deciding, which variety to choose from for their cultivation and breeding processes. For the implementation of the open-source seed system in the Indian context, the CSA report advocated the development of the open-source principle through a seed network called the Open-Source Seed Network or OSSN.

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Functions of the networking teams

- Four teams functioning to maintain different aspects for the implementation of OSSS in India.
 - Conservation and revival of seeds,
 - Generation of VCU,
 - Participatory plant breeding/farmers varieties, and
 - Seed multiplication and distribution.


OSSS visualizes the public sector as one potential partner along with farmers for open source plant breeding.



This network comprises four teams functioning to maintain the different aspects of the implementation of the open-source seed system in India. These teams focus on one the conservation and revival of seeds, generation of VCU, participatory plant breeding and farmer's varieties, and seed multiplication and distribution.

It should also be noted that the open-source seed system visualizes the public sector as one potential partner along with the farmers for open-source plant breeding. Open source seed system advocates for participatory varietal development along with the public sector to enrich the breeding process.

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The slide features a title 'Participation of the public sector' in a pink arrow-shaped box. Below the title, there is a paragraph of text and two bullet points. To the right of the text is a small black and white photograph of a person sitting on the floor surrounded by various bowls and containers, likely engaged in seed selection or processing. In the bottom right corner of the slide, there is a small inset video frame showing a woman with glasses speaking.

Participation of the public sector

OSSS advocates for participatory varietal development along with public sector to enrich the breeding process.

- The idea for OSSN is to form the basis for coordinating efforts of various NGOs and public sectors at national level.
- Creation of a space of commons where individuals and groups negotiate and defend their common lived experience.

The idea of an open-source seed network is to form the basis for coordinating efforts of various NGOs and public sectors at the national level. Here, therefore, we find the creation of a space of commons where individuals and groups, negotiate and defend their common lived experiences.

Individuals and groups sharing this space are thus connected through a new kind of or through a new culture of relatedness, in which the farmer's linkages are based not on kinship or biology, but through common management of other biological species that is the plant and the seeds. And this common culture or new culture of relatedness was given by Asthera.

Rather than the traditional static social relations of family and village, it is the active dynamic of what farmers do in the farming practice that connects them. It is also interesting to find that the open-source seed network plans to bring in the public plant breeding sector into the network, finding similarities between the motives. That is developing varieties without restrictive rights of the two.

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The slide features a title 'Creation of a space of commons' at the top center. Below the title is a list of four bullet points. To the right of the text is a photograph of a cluster of dark, elongated seeds. In the bottom right corner of the slide, there is a small inset video frame showing a woman with glasses and a red and green sari.

Creation of a space of commons

- Individuals and groups connected through a 'new culture of relatedness'
- Farmer linkages are based 'through the common management of other biological species – the plants and their seeds' (Aistara 2011, p. 494).
- Social relations are active and dynamic
- OSSN plans to bring in the public plant breeding sector into the network, finding similarities between the motives (i.e. developing varieties without restrictive rights) of the two.

One important difference between the approach of the open-source seed initiative and the open-source seed system is that the open-source seed system looks at the farming community as an important creator and facilitator of its initiative. Whereas, the open source seed initiative approach considers the plant breeder as important for facilitating the open source seed initiative, being based in the United States context.

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Differences in the approaches of OSSI and OSSS

- OSSS looks at the farming community as an important creator and facilitator of its initiative
- The OSSI approach considers the plant breeders as important for facilitating OSSI.
- With the introduction of open source into seed management, seeds - a protected resource under the state law
- The two NGOs still regard seeds as common property to be shared and used with communities having rights over the resource.

The slide also features a small video inset in the bottom right corner showing a woman with glasses and a red and green sari speaking.

Referring to the practices of the two NGOs that were studied here, we find a different understanding of repossession in the case of the open-source seed initiative. With the introduction of open source into seed management, seeds tend to be seen as a protected resource under state law. Whereas, the two NGOs still regard seeds as a common property, to be shared and used when the community has rights over the resources.


The NGO employed the more direct mechanism of an informal seed-sharing system through networking and focus on changing agricultural production without giving much consideration to the legal mechanism.

Thus, the two NGOs cater directly to the needs of the farmers and exchange materials based on the principle of double the amount or for a relatively small payment.


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Differences in the approaches of OSSI and OSSS

- Contrarily, OSSI - motivated to employ open source to use plant material for the goal of breeding.
- Goals of the two NGOs - maintain diversity.



- The OSSS being developed in the Indian context has included -
- Functions of the two NGOs (grassroots network model, including farmers and farming communities)
- OSSI initiatives (open source principles, through the use of GPLPG) as its strategy to repossess seeds.





On the contrary, the open-source seed initiative is primarily motivated to employ the open-source use of plant materials for the goal of breeding, which again is quite different from the goals of the two NGOs for maintaining diversity.

The open-source seed system being developed in the Indian context has included some functions of the two NGOs. That is a grassroots network model including farmers and the farming community. And the open-source seed initiatives like function on the open-source principles through the use of GPLPG, as its strategy to repossess seeds.

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Conclusion

- Thus, it appears that OSSI, OSSS and the NGOs understand access and freedom as two pillars for seed repossession.
- Approach to achieving access and freedom for seed repossession is very different.
- Repossession of seeds in these cases also acts as a first step towards commonisation of the resources and bridging the metabolic rift.



Thus it appears that OSSI, OSSS, and the NGOs understand that access and freedom are the two pillars of seed repossession, but their approach to achieving access and freedom for seed repossession is again very different. Repossessions of seeds in these cases also act as the first step towards the commonisation of the resources and bringing in the metabolic fit.

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Through these cases, we can see how open source and commons are operating in the agricultural field, where the idea of bringing in commons or commoning the seed for all 4 cases is the same.

Thank you for listening. And have a great day ahead.