

If you shall critique something, then you have to create an alternative

- *An ethnographic study of Navdanya Biodiversity Conservation Farm's
practices of farming with nature*

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Abstract:

This thesis is an ethnographic study of Navdanya Biodiversity Conservation Farm, and their critique of the industrial agriculture and food system that focuses on agricultural intensification when the real issue is about food availability and distribution. The main critique is that industrial agriculture is based on extraction and focuses on profit rather than the livelihood of farmers. That it is insufficient in delivering food security especially for small scale farmers, as well as in handling extreme weather events that can cause loss of yield, soil erosion, and that there is a deficient security net for small scale farmers when this occurs.

The findings are, from interviews with people that work at Navdanya and their expressions and perceptions that indicates the importance of living seeds, living soil and living food which can be achieved through practices of biodiversity farming.

The interviewees answers are compared with Ariel Salleh's concepts of metabolic rift and metabolic fit, reproduction with meta-industrial labour and metabolic value, as well as Arne Naess' concept of Self-realisation and deep ecology. The interviewees' experiences explain how biodiversity farming, which is advocated by Navdanya, is nature-centred. Food security, with minimal destruction on nature, is obtained through practices of diversity, which often adapts better to weather changes. This means that you don't rely on one single crop. You rather follow nature's cycles. Navdanya has been able to influence a change in agriculture based on the understanding that all living has a value within itself, its about livelihood for all living species.

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1. Introduction

It is always better to have your own seed and have your own food - Prisha

The current food system produces enough to feed the world's population but access to food is unequal. A report from 2016 by International Panel of Experts on Sustainable Food Systems (IPES–Food) states that 795 million people go hungry, 2 billion suffer from micronutrients deficiencies, and 1.9 billion are obese and/or overweight. The Food and Agriculture Organization (FAO) have reported that global hunger has increased from 777 million in 2015 to 815 million people in 2016 where the most vulnerable people live in sub-Saharan Africa and South Eastern and Western Asia. Lack of food security is mostly affecting people in conflict areas, especially when aggravated by extreme weather events such as flooding and drought (iPES, 2016:8–9 & FAO, 2017). It is an issue of food availability and distribution rather than a need for agricultural intensification (Tschamtker et al, 2012:55). In an FAO report by Gustavsson et al, it shows that about one third of edible food is wasted which is estimated to 1.3 billion tons per year. The food loss is as high in industrial countries as it is in developing countries, but the difference lay in the production chain. In developing countries, the food loss appears on post-harvest and process levels but in industrial countries the food loss is at retail and consumer levels (Gustavsson et.al 2012, 4–5). Loss of biodiversity and extraction of natural resources is further unsecured by the agriculture and food system, and where between 19-29% of anthropogenic greenhouse gas emissions come from food systems, and about 70% of water withdrawn from streams, lakes etc. goes to agriculture (Ceccarelli, 2017).

The Report on the Right to Food by UN Human Rights Council stresses that food availability is highly important, the food system needs to ensure food for everyone. Agricultural practices should increase the income for small scale farmers, and agriculture should not compromise the future of the earth. Furthermore, the report also mentions that a lot of focus has been on increased yields which require that the farmers need a lot of input, such as improved seeds that need a lot of chemicals to tackle pest to ensure a high yield return (De Schutter, 2011:5–6). Industrial farming or often referred to as conventional farming, is highly dependent on fossil fuels, chemicals, fertilizers, antibiotics and production for national and international markets, with a long value chain. It demands an intensive usage of machines for labour-saving production and the agricultural land is changed into monocultures and encourages genetically uniform varieties with intensive chemical use to achieve high yield and economic return (iPES,

2016:10–11).

Industrial agriculture systems produce only 30% of the world's food and the rest is produced by small scale farmers (57.5%) and nomads (12.5%). Small scale farmers also constitute 50% of the world's hungry so there is a need to strengthen and to ensure their food sovereignty and food security (iPES, 2016:9). The World Food Summit in 1996, at the FAO headquarter in Rome, brought the concept of food sovereignty to public attention. The concept was developed by the international peasant movement, La Via Campesina; Food sovereignty is the peoples', Countries' or State Unions' RIGHT to define their agricultural and food policy, without any dumping vis-à-vis third countries (La Via Campesina, 2003). It includes; farmer's and peasant's right to decide what food to produce and consume, agricultural prices on import and production of food, people participation in food policy, and recognition of women in agriculture. Food sovereignty is closely linked to the concept of food security which includes to ensure people's availability and access to adequate quantities and nutrient food for one's well-being. The concept of food security dates back to the UN Declaration of Human Rights in 1948, but wasn't fully adopted until the World Food Summit in 1996 (FAO, 2006:1).

I spent five months learning and practicing biodiversity farming at Navdanya Biodiversity Conservation Farm, in Northern India. The founder, Vandana Shiva was 30 years back, in her own words seeking an alternative to the linear industrial agriculture, an agriculture system that respect the flow of nature and farmers. The main arguments to create Navdanya was, as Shiva claims, the failure of the industrial agriculture, including the Green Revolution, to deliver a long term solution to increase agriculture production. In her own words, Shiva talks about violence on seeds, soil, nature and also violence against farmers, not being able to support themselves and their families due to costly seeds, chemical fertilizers and practices that the modernisation of agriculture introduced in India (Shiva, Singh & Singh, 2017:74–75). Navdanya was established to generate a non-violent farming, which then led to the focus on biodiversity farming. The key concept of biodiversity farming is local and indigenous seeds, healthy soil that ensures life of all living species from microorganisms to plants and trees. Biodiversity farming is organic which means that there are no artificial chemicals used and no machines for ploughing, and instead Navdanya follows indigenous traditional farming, such as using bulls for ploughing. Each and everyone is said to have a role in the ecosystem, and the soil is improved by giving back and adding green manure and compost to achieve healthy food. Biodiversity farming increases the livelihood of farmers because they first grow food for their

own consumption to become self-sufficient and then the surplus can be sold or exchanged at local farmers' market.

The current food system is arguable unequal and do not secure the livelihood of the majority of farmers. A crucial point is that the world's hungry are actually farmers that disputably have been "caught" in a production system that focuses on profit rather than livelihood. Navdanya argues that a change is needed, and this spurred my interest in the food debate and to share my own experiences from Navdanya. An extract from my journal, regarding what Navdanya is in my own words, gives an example of what caught my interest; "We work in the field, and or at the Gyan (knowledge) garden where all the bijaks (interns and volunteers) can decide and be creative with their farming. To plant new crops, or design or build and try new combinations, to take care of the land and to learn from it. The whole idea is to work with your hands, heart and head" (From journal 31st July–7th of August, 2017).

1.1 Research Problem

If food is a question of access, especially for people situated in the periphery of the world, it could be argued that farmers themselves should have the right to decide what to grow on their land and be able to feed themselves and their family. The current food system is highly dependent on a few varieties of crops, i.e. rice, maize, and wheat which often are controlled by a few large corporations, which means that decisions are made "outside" the farm where the actual food is produced. Knowing the farmland is important and particularly with increased and irregular weather changes across the globe which affects the harvest outcome and soils become more and more depleted. The search for fertile land has become a challenge and according to Navdanya, heavy industrial agriculture puts restraints on nature and on food security. The industrial agriculture system is based on intensive usage of fossil fuel, chemicals and monocultures following a linear extraction for high yield and economic return rather than to focus on the need to feed the population and to care for nature.

1.2 How the research questions were developed

During my time at Navdanya as well as my choice of doing an ethnographic research, an interest to understand the larger issue became apparent to me. Navdanya was created out of a critique of the existing agricultural and food system, a critique that it is insufficient in delivering food security especially for small scale farmers. A critique also that it is insufficient in handling extreme weather events that can cause loss of yield, soil erosion, and that there is a deficient security net for small scale farmers when this occurs. The main critique from Navdanya is that

industrial agriculture is based on extraction and focuses on profit rather than the livelihood of farmers. Farmers become dependent on a larger market, international market, and when unable to deliver, they often find themselves without an income and without food. When reading the work of Ariel Salleh, she is a sociologist and ecofeminist, there are similarities in how she formulates how the capitalistic system operates. There are mechanisms which creates inequalities that tend to serve the people that are within the system and not the people outside, the meta-industrial labour, who do not gain from the system. They are performing work that Salleh defines as reproductive rather than productive. Navdanya also talks about farming with nature and they also talk about their relationship with nature. This spurred my interest in how this relationship takes form and how it is present in their work at the farm. Reading Arne Naess, founder of the term deep ecology, and his concept of Self-realisation further caught my interest as a researcher to try to explain the importance of and the relationship with nature. This critique from Navdanya of the industrial agriculture and food system, was the driving force to establish something different. This is what caught my interest, the work of Navdanya and what its contribution might be. Therefore, by interviewing people that work at Navdanya gave some personal perceptions of what Navdanya's practices are contributing to.

1.3 Research Questions

A.1) According to the interviewees, what are the major benefits with biodiversity farming in comparison to industrial agriculture?

A.2) How do the interviewees experience their work in relation to food security?

A.3) How do the interviewees experience their work in relation to extreme weather changes?

A.4) What are the interviewees perception of nature and how is it present in their work on the farm?

B.1) How are the interviewees experiences related to Salleh's concepts of metabolic rift to metabolic fit, reproduction with meta-industrial labour and metabolic value as well as to Naess' concepts of Self-realisation and deep ecology?

1.4 Research Aim

The research was developed during my internship at Navdanya and was inspired by a quote from Vandana Shiva during one of her lectures at Navdanya; "If you shall critique something,

then you have to create an alternative”. According to Vandana Shiva and the way they work at Navdanya there is a need to change the agricultural system in a way that cares for all living species which is not destructive to nature and humans. The aim of this research, from the interest of a small scale farmer, research in what way Navdanya might be able to deliver an alternative agriculture system to what they are criticising i.e. an agriculture system that can enable food security for farmers, withstand and or adapt better to extreme weather events and that is based on the cycles of nature.

1.5 Research Objective

The objective of the research is to present and analyse Navdanya’s practices of biodiversity farming and agricultural techniques by using an ethnographic research method and semi-structured interviews. The answers from interviews have been transcribed and structured under themes such as food security, weather events and perception of nature. The answers from the interviews will be discussed and analysed based on ideas of Ariel Salleh and Arne Naess. The purpose is to understand, from the perspective of small scale farmers, the relevance of Navdanya’s critique of the industrial agriculture system and biodiversity farming’s ability to be the alternative they are advocating.

2. Methods and Methodology

2.1 Methodology

The research follows a critical realist perspective, meaning that it exists a social reality independent of our knowledge and where knowledge is somewhat linked to human perception. Furthermore, the observations in the field are to be analysed through theoretical reflections of Ariel Salleh and Arne Naess, to connect it to a context (Davies, 2008:46).

2.2 Applied Method; Critical Ethnography

I have decided to do an ethnographic research, a study of people in their natural surrounding as well as the nature at Navdanya. Participatory observation requires both involvement and detachment from what is being researched. There are different ways of collecting material in ethnographic research, whereas mostly this research relies on interviews alongside personal experiences through participatory observation (Shagrir, 2017:11).

2.2.1 Participatory Observation

The choice of participatory observation came to be as an additional method since some of the aspects can be useful in the way data was collected for this thesis. I have to admit that it was

not a chosen method before my arrival. It rather came to be during my internship at Navdanya and when I realised I had gained a lot of knowledge. During my stay at Navdanya, there was a month-long course in September 2017 called; “A-Z Agroecology, Biodiversity and Organic Food System“ , so I have used notes from this as well as other notes and reflections as part of the collected data that the thesis relies on. From this I would be able to outline some relevant observations of outcomes with the agricultural practices (Davies, 2008:81).

Distinctive from a complete ethnography of participatory observation is that I do not study the people as much as I study nature and the techniques that are being used. So the observation is to include nature and living systems as part of the study, as being a part of the cultural and traditional heritage. This is inspired by Albert Howard, who wrote “An Agricultural Testament” and he argues that a healthy soil and natural farming exist in India, using mix-cropping and working with nature rather than against (Howard, 1940:11–15). Additional material is from interviews of people living and working at Navdanya, and it could be argued that to a certain extent this detach me as a researcher since I have not influenced or twisted their role by only relying on observation. But as I have taken part in the field work in terms of biodiversity farming, I have moved from an observer to a participant, where my own personal experience can influence my own objectiveness. But I see it as a positive role that I have possessed knowledge and I can share my experience on how I interpreted biodiversity farming by complementing it with understanding and perceptions from the interviews (Davies, 2008:83 & Shagrir, 2017:13).

2.2.2 Semi-structured Interviews

I have interviewed eight people that work at Navdanya and the interviewees are a diverse sample of age, sex and working experiences and field of expertise. The interviews lasted between 30 – 60 minutes and were conducted outside on the farm, which resulted in a comfortable conversation rather than a formal interview and where a lot of personal experiences and interests were expressed. It is interesting that they all come from different backgrounds which give a variation in terms of useful material. The interviews are voices from the employees, to hear their stories and perceptions on biodiversity farming, food security, experiences in weather changes as well as their perception of nature. I have chosen to do semi-structured interviews where I have structured some themes/topics and written some questions underneath, see appendix for interview guide. The questions are structured in a manner that the person that I interview describe their own experiences, feelings and opinions of for instance

biodiversity farming, industrial farming, food security, climate change, nature and climate resilience. I have tried to have as open questions as possible so that the answers do not get misinterpreted by my own personal interest and to avoid influencing the way they answer (Flowerdew & Martin, 2005:119).

I was able to record the interviews, which might set a different scene, since it can make the interviewee uncomfortable but since I have a relationship with the people that I interviewed, I felt that it did not inflict the setting or their answers. In one of the interviews, I had to use an interpreter, a woman that works at Navdanya. During this interview I took more notes and could follow along by the help of gestures and changes in the voices, which was helpful when transcribing to get more depth from the interview. Even though I was recording the interviews, I decided to also take notes, which were useful for writing down other observations alongside with what they were saying. Also it keeps the interviewees to continue talking. As mentioned by Flowerdew and Martin, it is useful to use silent encouragement, so I have tried to be as quiet as possible or rather just nod in agreement throughout the interview to try not to interfere. This way I have noticed that they happily continue to talk and after a while you can get more thoughtful answers as they tend to think for a while and rephrase the same things which reminds them of something more that they have experienced (Flowerdew and Martin, 2005:121). The interviewees' different areas of expertise has given rich material from technical description to personal reflections.

The purpose of conducting interviews is to get personal reflections and experiences of biodiversity agriculture. It must be stated that there is no intention to make a generalization regarding their answers. The expectation from the interviews is to learn from their knowledge and get personal perceptions of biodiversity farming, on food security, on weather changes and their relation to nature (Davies, 2008:106).

2.3 Reliability & Validity

The reliability shall be considered rather high to the extent that it is first source findings from the interviews that I have conducted alongside with participatory observation. It can of course be questioned if someone else would make the same findings, but I do believe in the overall findings and with other research on biodiversity farming the observations shall not differ too much between researchers and as it looks upon from a perspective of theories. I think the argument lies in that rather than criticizing the reliability but I am aware of it and realise that it might be questioned. As argued by Davies, the usage of multiple methods tends to increase the

validity and I do believe that the correctness of the finding is rather high, but as mentioned the presentation of findings/truths is also connected to the choice of theory and how well argued and how well put the findings are (Davies, 2008:96). It is impossible to repeat an ethnographic study completely but for the sake of this research, the overall arguments are repeatable with the discussion on a broader level. However, these specific field notes and observations might not be repeatable and might not be desirable. I do not think that it inflicts the reliability, and the generalization of the findings can therefore be made in connection to the chosen theory, that it might say something about a broader context than the observation in the field itself (Davies, 2008:103).

2.4 Ethical Considerations

2.4.1 Informed Consent

I have informed my interviewees about the research, the pros and cons of their participation and that their answers will be anonymous in the research, where some had no problem of having their full name in the research. The names that are used in the research are changed, to keep the interviewees answers anonymous. There was no hesitation to be a part of the research and most of them were used to give interviews. As for consent regarding the participatory observation, it is not as much of a study of the people as it is of different farming techniques and the surrounding nature. So for that matter I do not see any limitations with it, but I am well aware of the fact that I might have to reconnect with the people that is part of the study if that was the case (Davies, 2008:55–56).

2.4.2 Positionality

It is important to be aware of different power relations that might exist between the objects of study and between the interviewees and me as a researcher. I felt that since I conducted my interviews in mid- November, when I had been at Navdanya for about 3.5 months, I knew them and they knew me fairly well. It made it easier and they were happy to take part in my research. Before I did the interviews I asked my supervisor, who then asked around and notified them that I would like to interview them. This allowed them to accept or decline without having to talk to me directly, so they wouldn't feel the pressure of accepting. All who were asked, accepted being interviewed. As I informed them, the interview questions are based upon their own experiences and knowledge, and since they all have long experience in their field of work, most of them had no problem of talking (Flowerdew and Martin, 2005:113 & Davies, 2008:120).

2.5 Limitations to methodological approach

In the early stages of the research, I wanted to have a larger focus on nature, climate change and climate resilient crops in relation to industrial farming versus biodiversity farming which is the reason why the interview guide has an extensive focus on these topics. Due to time and scale I decided to focus on if and what biodiversity farming contributes to, in relation to food security, how to tackle weather changes and the perception of nature.

Another important limitation to highlight is concerning ethnographic research and the time frame. In general, it is difficult to make generalisations of the research and especially in this case where my internship lasted for 20 weeks and where the research was developed during my stay at Navdanya. Due to this, as mentioned above, the research from participatory observation is concerning the natural surrounding and biodiversity farming practices rather than the people itself.

As for limitations regarding the interviews is the language barrier, but most of the workers on the farm speak English and gestures have also been used for communicating during farm work. As a way around this, an observation that I have made is that communicating with one another by using gestures, or pointing or sounds of other kind, or facial expressions became very important and it can actually say a lot more than words. Since English is neither of our mother tongue I have come to appreciate other forms of communication, and when you have moments when you tend to "brain freeze" and/or forget the exact word, you tend to use other forms for describing. This has come to be an important observation when it comes to knowledge, and that knowledge does not lay in the amount of vocabulary that you have. Knowledge is much more and farming is practical knowledge, using gut feeling and knowledge of the hands which could be argued have been lost in modern industrial agriculture, based on objective scientific proof, whereas traditional knowledge is often orally past on from one generation to another (Davies, 2008:87). So what could at first be seen as a limitation, in this case actually became a widened understanding of knowledge.

3. Theoretical Framework

The research will use Ariel Salleh's concepts of metabolic rift to metabolic fit, reproduction with meta-industrial labour, and metabolic value as well as Arne Naess' concept of Self-realisation and deep ecology to explain the phenomenon behind current food system's lack of an even distribution and food availability. Ariel Salleh is a Sociologist and Ecofeminist, and

she has written about relations between humanity and nature as well as ecofeminism and the theoretical framework is based upon the article; “From Metabolic Rift to “Metabolic Value”: Reflections on Environmental Sociology and the Alternative Globalization Movement” and “Ecofeminism as Sociology”. Arne Naess was a Norwegian professor famous for having created the term deep ecology which have influenced the environmental movement. The theoretical framework is based upon his book; “Ecology, community and lifestyle” and additional interpretations from Stephan Harding’s book; “Animate Earth; Science, Intuition and Gaia”.

3.1 Salleh’s perspective; from Metabolic rift to Metabolic fit

As argued by Salleh, capitalism in the pure search for profit has caused a metabolic rift, which is the continued extraction of resources resulting in deforestations, loss of soil nutrients, water and air pollution and toxic waste. All this is related to the production within industrial capitalism that has also led to the destruction of human-nature relationship (Salleh, 2010:206). The last decade’s overproduction and extraction of resources by industrial states, responsible for the biggest ecological footprint, have triggered poverty and land degradation in global South and this is due to global North’s own metabolic rift is being exported. Meaning, outsourcing extraction and production to developing countries to fulfil one’s own needs (Salleh, 2010:206). Intensive extraction leads to depleted land and nature, which only benefits the core i.e. mostly industrial countries (Salleh, 2010:209).

An important aspect that Salleh raises is her concept of meta-industrial labour, which is a labour force that contributes to the capitalistic system but do not experience the benefits of it. She has distinguished peasants, indigenous people and house workers who often perform non monetized labour, their work is often unrecognized even though their labour actually is contributing to the capitalistic market (Salleh, 2010:207). Capitalistic production is causing social and ecological inequalities, which is often to be resolved by the market, which could mean “restore” the order by investing in technology to solve the problems. But this could be argued to follow the same logic of extraction and depletion of resources and humans, to invent something new to deal with the failure of the previous invention. As mentioned by Salleh, social and ecological inequalities is best recognised and resolved by giving the control back to the people, such as access to land and the ability to become self-sufficient (Salleh, 2010: 211).

The metabolic rift is caused and intensified by the capitalistic system’s extraction of resources and exploitation of people, whereas the meta-industrial labour has been able to establish a

metabolic fit that cares for both human and ecological growth.

3.2 Salleh's perspective; Production vs. Reproduction

Peasants, indigenous people and house workers' labour is reproductive, meaning that humans and nature are connected, it is part of the ecosystem's give and take and it is adapting nature to human needs without damaging ecosystems and the environment (Salleh, 2003:71). Furthermore, their labour is reproductive in the sense that they transform their experiences from the material world, created by the capitalistic system, and the knowledge is being "reused" and applicable to situations in their reproductive world. It could be explained as meta-industrial labour is part of the capitalistic system but only for exploitation of their labour. The knowledge obtained is passed on and shared within the community and regenerates their metabolic value, which characteristics are sustainability, ecological and social metabolism, that enable them to restore control (Salleh, 2010:212). Argued by Salleh, meta-industrial labour has established a metabolic fit, as opposed to metabolic rift, for both human and ecological growth. It exists alongside capitalism, but it constitutes its own autonomous economy where people control their values for themselves as well as for the community (Salleh, 2010:212).

Reproduction is how people relate to or is living with nature, it follows the logic of how an ecosystem operates. Reproduction could be seen as a reaction towards the production that is carried out in the capitalistic system, and where reproduction is applicable on biological processes, cultural practices and economic relations which retain human social relation with nature. It is a necessity since it is adapted within the ecosystems, and as argued by Salleh many indigenous people see humanity-nature as a relationship, (Salleh, 2003:64, 67), whereas capitalism stands above, as a hierarchy with capitalism on top controlling humans and nature which arguable have led to humans becoming alienated from nature. Meaning that alienation has created a distance, by separating oneself and treating nature as the "other".

Reproduction could be seen within nature. Looking at well managed ecosystems there is a balance of extraction and production from various species resulting in a circular reproduction of resources.

3.3 Salleh's perspective; Metabolic Value

Salleh argues that humans are nature in embodied form, it is a way of recreating as well as it is conserving the metabolic values, which is essential to all organic systems. There is a notion to care for nature in contrast to only considering nature as resources, following a linear chain of

extraction. Exploitation of people and depletion of nature is occurring due to a wish for profit and to increase production. Recognising the metabolic value can operate as a political strategy to come together and further establish their “social metabolism that allows for nature to replenish” (Salleh, 2010:216). Metabolic value is; relational, internal and emergent in nature. Meta- industrial labour is associated with concerns for sustainability and eco-sufficiency which is encouraged in metabolic value, and where in an ecosystem metabolic value is created and it is protected from disorder, by its own reproduction. Metabolic value represents prosperous ecosystems which is a necessity for any economy. As opposed to the metabolic rift which is destructive and humans tend to try to control and redesign nature (Salleh, 2010:210).

Metabolic value is signified by meta-industrial labour which improve and care for nature and social metabolism.

3.4 Naess’ perspectives; Self-Realisation and Deep ecology

To be able to explain and understand the role of biodiversity farming and its relation to food security a perspective of the potential perception of nature is interesting. In addition to Salleh’s humanity-nature relationship, Arne Naess’, concept of Self-realisation will be used in the research. The concept of Self-realisation can be explained as the the move from personal ego to an expansion towards an ecological self. Every living species has a value within itself, so it is not restricted to only fulfil a purpose.

It is important to understand that Self-realisation is not a state of mind to achieve a complete realisation since that seems rather impossible. It should rather be seen as a process for action. As mentioned by Naess, which has also been critiqued, is the vagueness and difficulties to give a comprehensive explanation of Self-realisation but therefore it can be used as a guideline on how to look upon life, concerning all living beings. Self-realisation includes a personal as well as community self-realisation (Naess, 1990:8–10, 84 & Harding, 2006:50). It is important to mention here that the purpose is to see if it can explain some of the actions and perceptions of Navdanya’s practices and also the interviewees perception of nature. Naess mentions that an objective description of nature should rather be considered as a description of conditions of interdependence, and experiences of nature could be dependent on conscious or unconscious development of qualities. Experiences influence how one sees the reality or rather act upon it, as an example a forest could be seen as a set of trees or seen as a unity. The latter could be explained as accepting feelings as a way of how you look upon the world and nature. Nature should be something valuable, which humans are “inclined to treat with respect” and only used

to fulfil basic needs (Naess, 1990:50–51, 66–67, 85). The reason to include Naess deep ecology is to understand to what degree it is important, in relation to the interviewees perception, to see nature as something more than only valuable to human where the deep in deep ecology is a way of being in the world with minimal destruction of nature. This then leads towards a sense of belonging, where an interconnected approach is deep experience, deep questioning and deep commitment. Deep experience can be connected to awareness in life which might be achieved by a change of context i.e. as me going to Navdanya and experience something else and then questioning “my way of life” and maybe also society to get some underlying reasoning. This could lead to a feeling that there might be a need for change, and therefore a deep commitment to achieve it, which then leads back to deep experience (Naess, 1990:173–174 & Harding, 2006:51–52).

Self-realisation is the understanding of actions to move towards an ecological self and where the deep ecology stresses the importance of all living species has a value within itself. It could be expressed as a shift from human-centred to nature-centred.

I am well aware that this might lead into discussions that seem philosophical and that can be difficult to discuss in the frame of this thesis, but I do argue that it could be useful in trying to explain actions for change that are related to perception of what nature is and what nature can be. Or rather how experiences influence biodiversity farming at Navdanya and what that might imply. With this in mind, the thesis will now briefly introduce industrial agriculture, and the work of Navdanya to get a understanding of biodiversity farming practices.

4. Background and Context

4.1 Brief description of Industrial Agriculture and Food System

The development and range of industrial agriculture in India was spurred by the Green Revolution which was the spread of technology from developed countries and land reform, infrastructure improvement, chemical fertilizers and new seeds, which all lead to intensification of agricultural and food production to secure national food security. The Green Revolution reached India in the 1960s, when people had suffered from famine during the last years of the British colonial rule. And after India’s independence in 1947 the country was highly dependent on food import to feed the population. The Green Revolution changed the agriculture system in India (Djurfeldt & Jirström, 2005:43, 47–48, 53). The intention was to increase food production and to ensure food security using technological solutions which changed the agriculture system.

Argued by Djurfeldt, technological science for crop breeding of wheat and rice varieties, so called dwarf varieties, was the major intensification in the Asian context of the Green Revolution. These varieties were introduced in India and Pakistan, and together with introduction of chemical fertilizers the agricultural landscape was changed with the aim of high yield return. This scientific “breakthrough” resulted in agricultural development being conducted outside the farming areas, where now farmers became dependant on knowledge from elsewhere for industrial intensified inputs, shifting decision-making of agriculture practices from farmer at the local level up to national and international level (Djurfeldt, 2005:11–12).

It could be argued that together with the transfer of decision making for the development within the system of agriculture has led to intensification of monocultures where mass production of a few crops became the standard food production. This has led to a lack of diversity because the current food system in the world depends on only 12 crops. We have lost about 75% species and 93% varieties of food crops in the world and in addition we throw away a huge amount of food that is still edible (iPES, 2016:8–9 & Shiva et al., 2017:4–5). According to Singh, between 80-90% of human calorie intake comes from 3 crops; rice, maize and wheat (Singh, Lecture: 4th of September). Indigenous species of for instance legumes, grains and cereals are disappearing due to industrial rice, maize and wheat. It also affects wild biodiversity, disrupts ecosystems and pollinators, which have an important role and also operates as pest control for crops. This is drastically lower in industrial agriculture. It has been calculated that the economic value of pollinators is about 10% of the value of global food production (iPES, 2016:21–22). Claimed by Shiva et.al, industrial farming is responsible for about 70-90% of the global deforestation, pushing monocultures into previously forest areas for commodity production (Shiva et.al, 2017:1)

Uniformity and monocultures dominate industrial agriculture, and it could be argued that it makes the system much weaker and less resilient to adapt to climate change, whereas stated by Ceccarelli, mix and or diversity farming adapts better and some species can adapt to microlocation just metres from each other. Another important aspect is, that 73% of seeds and 76.1% of pesticides are controlled by a few companies (Ceccarelli, 2017). The market is controlled by the Big 10, the largest influential food and beverages companies in the world which are the following; Nestle, Pepsico, Unilever, Mondelez, Coca-Cola, Mars, Danone, Associated British Foods (ABF), General Mills and Kellogg’s. The Oxfam’s Grow campaign presented Behind the Brands in order to provide knowledge regarding these companies and the

way that their supply chain is effecting the food system. As mentioned before, the world's hungriest people consist of farmers or workers in the food system controlled by large corporations (Oxfam, 2013). Oxfam's campaign is to raise awareness and to challenge companies to take responsibility and actions for social and environmental impact.

Now moving from industrial monocultures towards biodiversity farming where the case of Navdanya and its farming practices will be presented.

4.2 History of Navdanya

Navdanya Biodiversity Conservation Farm cares about all life and regards farming as being one with nature. It is a combination of natural farming, organic farming, permaculture and biodynamic farming. Navdanya means "Nine Seeds", which symbolise the protection of biological and cultural diversity and it also means "New gift" based on the need to save and share seeds especially in today's extensive biodiversity destruction. The gift of Navdanya is the gift of life (Navdanya.org).



Figure 1. Navdanya's Location: In Doon Valley, Uttarakhand, nestled between the Ganga and the Yamuna rivers, below Shivalik Mountains, which is the foothill of Garhwal Himalayas (Google maps, 2017).

It all started in the 70s with the CHIPKO movement in northern India, with mainly women hugging the trees to stop the forest workers from cutting them down. And through this they protected the forest and protested against the removal and destruction. Dr Vandana Shiva, who is the founder of Navdanya, was part of this non-violent movement. Another influence is the Bhopal tragedy, a toxic gas leak at a pesticide plant in the state of Madhya Pradesh (From journal 21st–27th of August, 2017). As described on Navdanya's website: "Navdanya was born out of search for nonviolent farming, which protects biodiversity, the Earth and our small scale

farmers”. During this period, the 1980s there were increasing evidence that the Green Revolution did not, according to Vandana Shiva increase agricultural production as it was meant to. She wrote the book “The violence of the Green Revolution” describing the importance of getting control over your own livelihood, seed rights and food sovereignty as well as to strengthening small scale farmers. Indigenous knowledge that had been up “for sale” in India partly as a result of the Green Revolution. This is how Navdanya came to be what it is today (Shiva, 2017a).

It started by saving seeds; Vandana Shiva walked between villages and in remote areas to meet people and collect indigenous seeds. Today Navdanya’s seed bank consists of 127 community seed banks and 506 small local seed banks in 22 states in India and has up to 5,000 crops varieties all together (Navdanya.org). Before the Green Revolution, India had over 100,000 varieties of rice (Deb, 2014). Navdanya has managed to save about 735 varieties of rice in their seed bank. Then in 1993, Vandana Shiva bought the land where Navdanya now is located. The place was full of Eucalyptus trees, which is a species exotic for India. They were all replaced with indigenous tree species and a lot of legumes. These trees and plants originated from the region and were crucial in order to restore nature and rebuild the soil that had been destroyed through commercial mono-cropping. A lot of compost was used to heal the soil. After about four years the chemical depleted soil had regained fertility (From journal 31st July–7th of August, 2017).

Navdanya started, over 30 years ago with a seed bank to strengthen biodiversity. In the year 2000 they initiated Bija Vidyapeeth (Earth University) to give courses on Gandhian principles and training for farmers. The Earth University has trained over 900,000 farmers across India. As stated on their website;

The main objective of the centre is to minimize the rift between scientists and farmers and also to popularize the appropriate use of science for the people’s benefit and prosperity, giving due respect to the farmer’s wisdom. It will also help in reinforcing the farmer-scientist relations.

(Navdanya.org)

I spent about 20 weeks at Navdanya, from August to December 2017. I was an intern, a bijak, learning different farming techniques by practical experience and also through theoretical

sessions. Navdanya’s practices of biodiversity farming described in this thesis are based on experiences and the knowledge that I gained during my time at Navdanya, in combination with material from the month-long course in September called; “A-Z Agroecology, Biodiversity and Organic Food System“ and Navdanya’s own publications describing their work.

4.2.1 Biodiversity Farming and Techniques

Extract from my journal in November, 2017; All the rice fields have been cleared and the rice has been brought to the seed bank for saving. About 20 samples from each variety goes to seed saving and the rest is being consumed on the farm. Navdanya’s seed bank consist of 735 different varieties of rice. Since it is a living seed bank you have to sow the seeds every year so they adapt to the climate and weather changes over the years (From journal November, 2017).

4.2.2 Seed selection and saving of rice

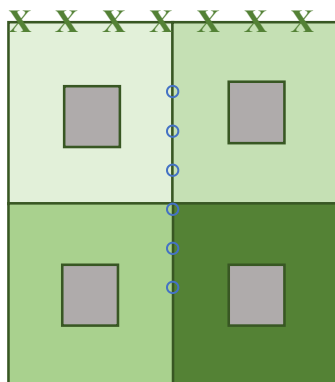


Figure 2: Demonstrating rice field & seed saving

Each colour block represents one variety of rice, the middle part, approximately 2x2m (depending on the size of the field) is for the saving of seeds, and within this area you know the variety hasn’t been pollinated with another; a cross-variety. The X on the border represent marigold, useful as a pest repellent crop. It is planted around the field as protection, so that the pest will attack the marigolds instead of the rice. The circles represent ragi, also called finger millet which is planted between each variety to make a division but also since ragi grows higher than the rice plants it also functions as a shield to prevent cross-pollination.

After the rice is harvested they plant legumes on the field because it is a nitrogen fixing plant, pulses are also nitrogen fixing. They use the technique of crop rotation since it helps to prevent diseases and pest, it increases the fertility, biodiversity and the soil structure (Singh, 2017). So for instance, at Navdanya they grow rice and millet during summer (June – October) and during winter (November – May) wheat, barley, oats and legumes.

4.2.3 Crop Rotation & Mix Cropping

In addition to crop rotation they also do mix-cropping, where several crops in different combinations on each field are common, such as lettuce/ mustard/ radish and/or rice/ maize/ lentils. It has been researched and tested at Navdanya that these crops go well together or rather that they complement each other. For instance, some crops grow well together, so called

companion plants such as; Maize – Cucumber, Pea – Mustard, Carrots – Tomatoes, Maize – Beans, Chili – Brinjal, Ginger – Turmeric, Radish – Tomatoes, Cauliflower – Potato. Also the amount of crops per field varies, but they do have fields that can contain a mix of up to 12 different crops. After every season they do a soil analysis in order to know what crops that can be mixed together next season or what kind that shall be used for the soil to be nutritious (From journal 8th-13th of August, 2017) .

Navdanya has a plot with 12 different pest repellent plants and on this Tuesday, the 14th, we were clearing that area. Later they will make a liquid pest repellent spray out of a mixture of all of the plants. Then it will be sprayed on the crops as a protection. So there are several functions of one plant and at Navdanya they are constantly doing research on different usages of plants (From journal November, 2017).

4.2.4 Pest Repellents

Another important knowledge is that every plant has its “own” pest so mix cropping helps to prevent the pest not spread to other areas. Example of pest repellent plants; basil, coriander, onion, garlic, mints & marigold on bunds or with other crops. According to the thinking of Navdanya spraying chemical pesticides kill the pest but also the predator of the pest which then leads to a super-pest. It creates bigger problems, because you disrupt the harmony in nature. 0.1% of the chemical pesticide is digested/removed, the rest is still in the atmosphere, in the air and it comes down again with rain and contaminates lakes and watersheds and spreads out and into the soil again. Even though you are not spraying chemicals they are still in the air and water so you get them in your system, it’s a way to modify the planet (Bhatt, 2017). One might argue that humans are trying to control or master nature. It is important to understand that one shall not force plants and vegetables into ecosystems where they do not belong. This is the reason for virus and pest to emerge and that certain species go extinct when you introduce alien species into functioning ecosystems, with the only intention to serve humans. As argued by Bhatt, the first and most important step is the soil, because healthy soil leads to nutritious food and food security, the key is to be self-sufficient so you do not have to depend on the market (Bhatt, 2017).

4.2.5 Summary of practices

Navdanya practises biodiversity farming which is free from chemicals and follows the local environment, farming with nature and not disrupting the existing ecosystems. The key elements for this is to use local or regional seeds, mix cropping that are beneficial for one another and to

rotate the crops so that the soil doesn't get depleted. Navdanya argues that healthy soil is important in order to get nutritious food, therefore it is necessary to use a lot of green manure and compost to give back to the soil, to feed the living organisms in the soil, because nothing can substitute living material. A quote from Albert Howard who wrote "An Agricultural Testament"; "Chemical manures will be considered as one of the greatest follies of the industrial epoch" (Howard, 1940:38). If one follows nature's own method, crops are mixed together and with animals, and material is being absorbed by the soil, following a cycle. As a farmer you have to be present and attentive and know your farm, so that you can prevent diseases and pest etc., see the need of your land. For instance, nitrogen is conserved within the soil and if you cultivate and plough it too much it will oxidize the reserves and disrupt the balance. Because if this, at Navdanya they use bulls for ploughing and only plough 7–12 cm of the top soil.

Argued by Howard, Indian agriculture has managed to feed its population but due to for example the introduction of cotton, the agriculture turned to meet the needs of the market and demands for commodities and industry. It has become food crops versus cash crops (Howard, 1940:11 –15).

This shows some of the biodiversity farming practices at Navdanya, through my own experiences alongside research on biodiversity farming. But what else is required, in what way can Navdanya be the alternative that they claim that they have created and what conclusion can be exposed to understand Navdanya's work in relation to food security, ability to mitigate weather changes and what role does nature have according to the people that work at Navdanya.

5. Presentation and analysis of findings

The research will rely on answers from the interviews that have been conducted with people that are working at Navdanya. According to the interviewees, the major benefits with biodiversity farming in comparison to industrial agriculture will be presented as well as their experiences of food security, weather changes and perception of nature. The answers from the interviewees will be compared with Salleh's concepts of metabolic rift to metabolic fit, reproduction with meta-industrial labour, and metabolic value and with Naess' concepts of Self-realisation and deep ecology.

5.1 From industrial farming to biodiversity farming

To frame the situation of today and to distinguish some actions needed the research will incorporate different opinions from the interviewees on industrial agriculture and biodiversity farming. As mentioned earlier, Navdanya was created to stop the violence on seeds, soil, nature and violence towards farmers by reintroducing and strengthening basic agricultural knowledge in India. One can not ignore the effect of history and it is important to understand its influence on the Indian agriculture system. From a discussion with Ira on organic farming in India and industrial monoculture that was introduced with the Green Revolution, and how Navdanya tries to reinforce the knowledge that the farmers in India possess by tradition, I find the following statement capturing:

Ira:

Knowledge in India, [...] and organic farming [...] or you can say traditional farming, that is not new for India, unfortunately what happened [...], India was under British rule for many years so whatever comes from West is considered as you know an order, as a principle, that okey, this is what it should be.

A perception is stated that principles from the West should be implemented in order to develop, and also that decisions are made “outside” the field of the farms. One could argue that the aim to increase agriculture production in India is to benefit the increasing need from the core. As mentioned by Salleh it is the search for profit and the extensive extraction of resources that has caused the metabolic rift, which is now also exported to the periphery, by outsourcing extraction and production. The meta-industrial labour often contributes to the capital market but rarely benefits from it (Salleh, 2010:206, 209). Whereas Navdanya then tries to reinforce and strengthen farmers by advocating the traditional agricultural knowledge in India, which cares for both human and ecological growth and that is related to the metabolic fit. One of interviewees expressed her thoughts on the statement that organic farming requires more labour and that industrial farming can deliver a higher production.

Jayesh:

The difference with industrial farming and the farming in the rural area, is that industrial farmers are workers, in rural farms, farmers are the family, the community, the villagers, friends, so there is a relation in the rural area. But in industrial farms the relations are

just the worker, employer, manager, management [...] so the connection [...] is not just with the soil but also with humans.

As claimed by Salleh, the meta-industrial labour has been able to establish a metabolic fit, which is beneficial for human and ecological growth as opposed to the metabolic rift. Furthermore, meta-industrial labour has never completely been “colonized by capital” (Salleh, 2010: 207, 211). At Navdanya, work is enjoyed together on the farm, it is eco-sufficient to the extent that it is not preformed at the expense of others, no exploitation of the farmers nor extensive extraction from nature. It is about the connection with the land and connection with humans when doing agriculture, there is a sense of caring for your land and for biodiversity which is reproductive work, rather than the productive work that oppress workers and deplete nature. Industrial agriculture operates as a linear process of extraction as reflected by Vihaan;

Industrial farming is using a lot of terminator seeds, GMO seeds or Bt seeds or hybrid seeds, a lot of chemicals like glyphosate, like round up etc. and it can be more of consumerism pattern, they are producing not for feeding the world but they are producing for profit.

This in contrast to how Vihaan reflects on the way that biodiversity farming operates;

Biodiversity farming, I would describe as working from ego to eco, uhhh not feeling that we are on the top of the food chain as human beings but that we are a part of the food chain, in the ecosystem, creating home for the pollinators, working with a living soil, not killing the soil, not killing the microorganisms.

This kind of perception might be understood in relation to reproduction, which is applicable on biological processes, cultural practices and economic relations which retain human social relations with nature, whereas intensive production can cause social and ecological inequalities. As argued by Salleh humans and nature are connected and human needs are balanced with all living species and where you only take what you need, as in well managed ecosystems where there is a balance of extraction and production from various species (Salleh, 2003:71). Navdanya’s practices of biodiversity farming is not to produce food for mass production but rather for livelihood, and not only connected to the livelihood of humans but to all living, resulting in a circular reproduction of resources.

The practices and the meaning of biodiversity farming, is expressed by Rajiv:

The farmers, the consumers, the communities, families, the state, the government, all have to be sovereign, and uhhm...the process of it can only be if seeds remains as a right, food remains as a right, to each human being and the community and at its regions and [...]ecosystems level, all of these, the diversity and the crops are maintained [...] and that the farming are maintained as a biodiversity based organic farming.

It could be related to the argument by Salleh, where biodiversity farming is carried out by people who have established the metabolic fit that cares for both human and ecological growth where metabolic values are relational, internal and emergent in nature leading to and resulting in sustainability. In a well managed ecosystem the metabolic value is created and it is protected from disorder, by its own reproduction (Salleh, 2010:210).

According to Naess, deep ecology can be the shift from human-centred to nature-centred thinking, where a sense of caring is the main purpose. It could be argued that it contradicts today's worldview that is influenced by action and performance. According to the reasoning of deep ecology, it is deep experiences which raises the deep questioning, such as; "How can I change my life" and / or how should the society change, (Naess, 1990:173–174 & Harding, 2006:51–52) related to the statement from Vihaan, how can a change be established where humans are not on top of the food chain, and it enables a commitment that leads to change which then feeds back to the deep experience. One could argue that Navdanya is the deep commitment that leads to change, not only is it beneficial for the humans and nature at Navdanya. As mentioned earlier they have trained more than 900.000 farmers across India. The biodiversity farming practices at Navdanya is leading to changes in the agricultural system in other areas of India.

There is a coherence in the interviewees' answers concerning biodiversity farming at Navdanya, where they all raise the importance of living seeds, living soils, and crop companionship where everything within an ecosystem is essential. It is important to see the whole cycle in agriculture as reflected by Aarush:

Diversity is necessary because every plant have value; medicinal value, some plant fix the nitrogen, some plants fix the phosphorus, some plants fix to the potash, so diversity is necessary.

Another interesting aspect regarding diversity was brought up by one of the interviewees. Diversity stretches further, is not only related to farming. It is part of cultural and traditional knowledge.

Jayesh:

India has been one of the countries that is so diverse in everything, like in food, people, language, culture, agriculture so we are so diverse and [...] we should focus on the traditional way of agriculture not the modern way. We still do our traditional way of Indian agriculture so, to let people know that our values, culture is really important and we should not forget about it.

As argued by Salleh, knowledge obtained is reused and passed on and shared within the community which regenerates their metabolic values established through social metabolism which allows nature to “reload”. It could be argued, that the modern way i.e. industrial agriculture, disrupt metabolic relation between human and nature, it is an extractive system that exhaust nature to achieve profit. Whereas in biodiversity farming, ecosystems and metabolic values are created and protected from disorder by its own reproduction. By recognising metabolic values issues of eco-sufficiency and sustainability, possibilities can be offered to overcome the metabolic rift which has been disrupted by capitalism. Meaning that metabolic value can operate as a political strategy to mobilise and establish socio-ecological reproduction (Salleh, 2010:212, 216). Therefore, it could be argued that traditional knowledge should be passed on in order to be able to retake control over your own livelihood. These values and knowledge are ground pillars for Navdanya, where it could be argued that they have been able to establish a place which shows that farming can be part of an ecosystem’s cycle, and enjoyed by both humans and other living species. Navdanya also challenges corporations that have introduced destructive farming techniques such as the introduction of Bt cotton by Monsanto in early 2000, and the extensive use of chemicals which is harmful for both humans and nature. There is intensive depletion of water resources when using Bt Cotton and chemicals which Aarush expresses:

If you grow Bt Cotton, Bt cotton might need more than twelve or sixteen times higher of irrigation, but if you go to organic cotton three or four times only, irrigation. So there is much difference between industrial farming and organic farming.

In Industrial agriculture there is constant extraction of resources, which results in metabolic rift and where Navdanya instead is using simple methods such as saving your own seed and using local species to restore a balance in nature and in ecosystems.

5.2 Food Security

As mentioned earlier, the industrial food system is highly dependent on a few varieties of crops, and it is criticised for not securing food availability and also for not producing quality food with all the minerals and vitamins etc. needed for people to be healthy. The interviewees raise the issue of mass production and its effects, they reflect on the whole value chain and discuss some of the problems with industrial farming, the linear thinking of huge quantities of food contaminated with chemicals that cause problems further down the line. One reflection from discussions on the issue of food security, health and quality is:

Aarush:

Industrial farming, you eat too much. And in organic farming you eat less but healthy, quality and quantity is the two things. [...] In industrial farming it is only quantity not quality. But organic farming, quality.

According to Aarush it is important to see a long term solution to a growing problem, the ability to see the impact on the whole chain, for instance what kind of food most people consume and the health implications it causes. Several of the interviewees reflected on the health issue when it comes to food and where Prisha expressed:

We eat food to survive and to be healthy but the food that we are eating right now, it is making us sick and it is giving us diseases.

As Tara says:

[...] we are eating antibiotics or poison [...]. All the poisons that is also harmful for our body and if we are already using antibiotics in our food in daily routine then if we fell ill and uhm.. how will that antibiotic cure us?!

They raise the issue of quality and the issue of chemicals' and antibiotics' harmful effects on human life, the importance to have control over your own health, and as reflected, it can be achieved with simple means of healthy food. As mentioned earlier, FAO stated that over 800

million people go hungry and 2 billion people suffer from lack of micronutrients. These are important issues that they raise and there is not one solution to the problems with food security. The issue of food security was already framed in 1948 in the UN declaration of Human Rights and hunger in the world continues to increase. As claimed by Salleh, the capitalistic system has a tendency to “resolve” inequalities with money by investing in technology and industry, in this case to increase the production of food. Furthermore, she claims that some people, meta-industrial labour, is being exploited by the system and not getting part of what it delivers (Salleh, 2010:211–212).

One might argue that it should not be about developing agriculture to produce more, instead the discussions on finding sustainable solutions should rather be about where the decision making should happen. In this case, which Navdanya is advocating is that the farmers should be able to decide what to eat and to be able to be in control over their own livelihood, since their labour is related to metabolic fit. To assume that it is connected to a power battle could be considered rather apparent, decision-making is at a higher level with concerns that might differ with the actual situation and what is experienced on the ground. The power discussion is interesting but an in-depth discussion concerning power relations might be outside the frame of this thesis. However, if one considers that the metabolic rift is caused by “power hungry” humans, which have undermined the necessity to give back in a reproductive manner, capitalism creates a division and transforms social behaviour with nature in the search for profit. But this could be an “easy” explanation, that money and profit are the main incentives, it has been argued before, but assumed that this is also part of the critique by Navdanya, and where their incentive is to establish a system not driven by profit. By strengthening the meta-industrial labour, ecosystems can flourish. Rajiv expressed the importance of strengthening the role of farmers.

Rajiv:

Food security has to be, first for the farmer, because it has to bring nutrition and it has to [...] remove the hunger, has to make the environment well, and it has to keep the farmers, the families safe, you know it has to give them economic gains also and the consumers. The only reasons we have food on our plate are because farmers give it.

The way that Navdanya promotes food security is mentioned by Ira;

The first thing, what Navdanya does is that we are trying to convince farmers that you should become self-sufficient.

Navdanya advocates the importance to move from production and profit towards being able to support yourself as a farmer and to secure the livelihood for yourself and your family. Salleh do describe humanity-nature relationship which is obtained by the meta-industrial labour in reproduction (Salleh, 2010:212). Biodiversity farming that is practiced by Navdanya enables farmers to become self-sufficient and it is regenerative for both farmers and nature.

Food security is closely linked to diversity, but where the current food system is highly dependent on a few varieties, which could be argued to further increase the vulnerability for small scale farmers. A reflection from Aarush, which is short but to the point:

You grow only wheat, what would you eat? (actually asking me)

The notion that everything is alive, and that many of the interviewees repeatedly stress the importance of living seed, living soil, and also living food. Naess claims that every living species has a value within itself and its existence is not to fulfil a purpose (Naess, 1990:8–10). It might follow the logic of Naess, that Navdanya raises the importance to see biodiversity farming as a system to the extent that one has to think of food as living entity. Without seeds, and without a soil that is nutritious for the life within it, food security can't be ensured for farmers. Vihaan's view on food security could be seen as an example of this:

Vihaan:

When you have living seed and living soil, then that is when you have the living food. Food security is very simple, it is healthy food, nutritious food, indigenous varieties, biodiversity and at the same time food freedom.

5.3 Weather changes

The weather has become more extreme in certain areas, and it is affecting the farm work. The interviews brought up discussions on climate change and changes in the seasons which have been experienced both outside and on the farm, and they expressed their own opinions and experiences of the main causes for climate change and how their work on the farm have been affected, and some precautionary actions they have taken. Most of the interviewees describe climate change as caused by humans, and they draw connections to intensive usage of fossil

fuels, and high level of pollution in larger cities. New Delhi was mentioned as having reached one of the worst levels of dangerous pollution last year, 2017. They all raised the issue of deforestation and destruction of nature. In one of the interviewee's description of climate change, a distinction was made that there is one part that is natural and one part that is due to human interferences

Tara:

Climate change...uhhm (thinking) one is natural and another is...uuhmm....creation of....ourselves, like we are using so many fuels to drive, we are taking so many things from the earth, [...]we are making dams, and that is why the temperature [...] is getting high, and then the mountains are melting.

The changes in seasons have been the major effect that they have experienced on the farm as well as it has been expressed by farmers that they work with across India. The greatest effect is the irregularities of the monsoon period, which usually is from May – August, and it has been raised by several of the interviewees.

Jayesh;

[...]We suffered so much because of the monsoon being late and when it was time for the paddy to transplant the water should be [...] around knee level, but we had no water we had no rainfall and the farmers depend on the rainfall during this time. But we had nothing and then we did the irrigation, and it was fine but after the irrigation when the paddy needs [...] a dry area [...] we had a flood.

It is not the amount of rainfall that has changed, it is the period and timing of the monsoon. An interesting point from Myra is how Navdanya have managed to a certain degree, to adapt and sustain themselves with changing weather, or rather how to control the loss of yield.

Myra;

There are other varieties of rice/paddys that can be growing in heavy rainfall, and or in drought. So it does not really matter what kind of climate there is, it adapts to its time of sowing or if you sow it on the right time, it will adapt on its own.

It indicates that they can't and don't want to be solely dependant on one rice variety. As mentioned before, Navdanya have 735 varieties of rice and that shows the importance of diversity. A diversity within the same crop as well as a diversity between crops. This is

achieved, as mentioned earlier in the section of seed selection in the background chapter, see page 17. By using local and indigenous seeds and to sow them every year and select the ones that grow well to be used coming years allows adaptation to the changes in climate. This applies to the argument by Salleh, where one is using knowledge to reproduce the nature's cycle (Salleh, 2010:212), which could be stated to be the people's science, practices of a living seed bank that constantly is adapting to weather changes. It could be claimed that the work of Navdanya is eco-sufficient due to that they have established a metabolic fit including human and ecological growth, by increasing the diversity within different varieties, which consist of different characteristics that can adapt in different climate.

Many answers indicate that only relying on one single crop as in monocultures, leads to more vulnerability when climate changes. It is not to say that Navdanya is not aware of the problem, they have and are working on solutions on how to go about it. Another example on how Navdanya practices biodiversity farming and how they use nature's cycles in a way to sustain themselves as farmers, comes from one of the discussion with Ira on how Navdanya tries to tackle climate change;

Ira;

We started a programme called Seeds of Hope, that way we went to the remote areas [...] and tried to find the varieties which are resilient to the climate, like if there is drought, for two or three years, then we collected varieties from there, if there is an area that is flood prone, so we collected then local varieties from that area, and also we collected varieties from saline areas [...].

Biodiversity farming follows the rhythm and logic of nature. It learns from nature and how nature is able to sustain itself, for example irregularities in the weather. Naess explains that the concept of Self-realisation is also applicable on a community level, where it shall be seen as a process for action and nature should be treated or expressed through a description of conditions of interdependency (Naess, 1990:8–10, 64). This is related to that every living species contributes to the functioning of ecosystems, and that your farming can adapt to irregularities in the weather if one see the whole farm as a living system.

A strong reflection from Rajiv:

Climate resilience and climate change has to be understood in a systemic manner, you cannot just pick it up, separate it from an issue and say oh this is how you combat it [...]. It is a system, you can see it in the farm also, it is a system.

This reflection is very interesting and very important because there is awareness of responsibility, the responsibility that humans have. It is in line with the view of Salleh, that the core, which is responsible for the biggest ecological footprint, has imposed and moved production and extraction of natural resources to the periphery, for its own benefits (Salleh, 2010:206). From this viewpoint one could argue that the core is responsible for much more than they are taking responsibility for. In light of this, Rajiv frames it as this is now the opportunity to take control because it is affecting every living species on this earth. Even though the research is in the context of Navdanya, the way that interviewees express themselves is that it is for everyone and this way of thinking or framing issues that needs to be tackled follows the action of Self-realisation, to move from personal ego towards an ecological self, to be able to care for something more than just yourself.

5.4 Perception of Nature

Something that struck me during my time at Navdanya, is that farming with nature is not just about the concept of actually following the rhythm of nature and ecosystems cycles. While observing the different techniques that Navdanya practices such as seeds selection, crop rotation and mix cropping and pest repellent plants as well as perspectives from the interviews, there is a connection with nature which is a part of their way of life and in farming. From a conversation regarding what Navdanya means or how the interviewees would describe Navdanya, this was mentioned by Aarush;

I learned through my father and my grandmother about nature. And when I was 4 or 5 years old, at that time I had transplanted and planted a few trees, [...] and when I was 24 or 25 years old those trees were very big and high (showing with his hands). I sow, and I planted these trees and now the plant is very big and fruiting, and everything. So my (paus) vision and my view goes directly in nature.

As mentioned by Naess, deep experiences in nature generate a deeper questioning, concerning one's own role as human being or the role of society which enable a commitment to bring about change (Naess, 1990:173–174 & Harding, 2006:51–52). Aarush wanted to share an early memory from his life, since that could explain the choices that he has made in his life, from the

early years in his childhood to explaining the reason for continuing to study and for him to join Navdanya several years back. It was important for him to explain the role that nature plays in his life, his vision goes directly to nature.

Tara:

Nature fulfil our, all things and [...] nature give us different type of vegetables and different type of feelings, hot times we sit in the shadow [...], we get fire from wood. All theses things come from nature.

It seems that it is important to recognise that everything comes from nature and with this reflection it is interesting that also feelings are received from nature. As claimed by Naess, experiences influence how one sees the reality or rather act upon it, and if you see nature as unity it could be explained as accepting feelings as a way of how you look upon the world and nature (Naess, 1990:66–67).

Below are some of the reflections from the interviewees regarding the meaning of nature;

Vihaan:

Nature to me is...(thinking for a long time)...a space where you haven't destroyed and exploited the natural resources. The natural resources are intact and you, even though you are living in nature, nature is abundant, it can feed you a lot of stuff but you are working with it and not exploiting it or destroying it.

Prisha:

Nature is a gift of life, because its provides everything.

Myra:

It is air to breath, food to eat, shade to rest and all these things is nature. So it is not just good for one, but it is good for everyone. It's a gift for humankind.

Jayesh:

We are a part of nature so nature is everything and nature is us, its you, me, Dr. Vandana Shiva, people who live here, the plants, trees, everything so we are a part of it.

To describe or reflect upon the meaning of nature is complex. Most of the informants took some time to think, but somehow always expressed that they felt very connected to nature, it is

everything since all living is a part of it. It was a feeling of belonging and a references to “home” was made several times. One reflection caught my interest, when trying to explain what nature means;

Rajiv:

It actually means everything noo?! It is a very tough question because, separating or thinking about it already makes you feel so separate from it. Because we are within it, like right now we are sitting under the trees, (the interview was conducted outside at the farm) and on the grass, and the sun and the clean air, it is all nature right?!...(a pause for a few seconds) that’s home!

So these different expressions or perceptions of the meaning of nature could be argued to show that they all have a connection to or rather are connected with nature. In order to avoid and to force the interviewees perception of nature into the concept of deep ecology, or trying to explain their perception, one argument could be related to Naess. The argument of accepting feelings, that it could act as a clarification on a worldview and as a way to see and relate to nature (Naess, 1990: 67). As the interviewees express themselves, it could be argued that they treat nature as it has value within itself, that nature’s existence is not to fulfil a purpose and especially not a purpose for human needs. The interviewees did find the question of what nature means to them rather difficult to answer, as separating nature as a question to distinguish its meaning, it could create a separation which might not be there from the beginning. It could just be my pre-understanding that nature needs to be explained, to be conceptualised and rooted in as for example Naess’ Self-realisation, in order understand nature and the way Navdanya practices biodiversity farming. It could just be that, they haven’t on a personal level, as stated by Naess, made the “move” from personal ego to an expansion towards an ecological self. Meaning that they are already in an ecological self from the beginning, so it is “natural” to be a part of nature. As argued by Naess, an objective description of nature is not necessary, it should rather be considered as a description of conditions of interdependence, and where experiences of nature is dependent on conscious or unconscious development of qualities. Experiences influence how one sees the reality or rather act upon it (Naess, 1990:50–51). As Vihaan reflects:nature is intact, even though you are living from nature...., could this explain the practices of farming with nature, you only take what you need, reproductive and as mentioned by Salleh, “Social metabolism allows for nature to replenish” (Salleh, 2010:215). Experiencing nature in everyday life, could be that it makes it difficult to describe it, one has to feel it, accepting that feelings

are enough as a description as how to look on nature or being in nature. Following the reasoning of deep ecology, the cycle of deep experience, deep questioning and deep commitment, one might argue that Navdanya is existing within this cycle. The deep commitment is prominent with everyone that works at Navdanya, where the critique of the insufficiency of the dominant industrial agriculture and food system ability to achieve food security and adapt to changes in the weather, is the experience which lead to question the current system. Therefore, one could argue that Navdanya is the result of the commitment to care for all living species, and to practice agriculture with minimal destruction on nature.

6. Conclusion

The research is to compare the interviewees answers with Salleh's concepts of metabolic rift to metabolic fit, reproduction with meta-industrial labour, and metabolic value and with Naess' concepts of Self-realisation and deep ecology.

6.1 Salleh's from Metabolic rift to Metabolic fit

The Green Revolution's aim was to use technology and industry, to increase production in agriculture and food system, and also to outsource extraction and production. This resulted in a metabolic rift with culture and traditional knowledge in agriculture being "pushed a side" to make way for industrial agriculture. Navdanya on the other hand practices biodiversity farming, aiming to strengthen connection with your land and a connection between people, where you care about human and ecological development. Which could be seen as the metabolic fit. As raised by Salleh, the capitalistic system emphasises on increased production and extraction of resource. The agricultural and food system shall deliver quantities of food, but the system fail to deliver food security to the most affected people. It excludes the majority of people, that are contributing to the global food production, by relying on technology and mass production to deliver adequate quantities and qualities of food. The food that is produced is highly contaminated with chemicals which cause health problems for humans as well as it depletes the soil. Navdanya advocates farming with nature, meaning only using techniques that do not cause further extraction of natural resources. Navdanya contributes to strengthening small scale farmers in India, and encourages farmers not to rely on the exploitative capitalistic system that has caused the metabolic rift, and rather focus on reproduction that generates a metabolic fit that cares for human and ecological growth.

6.2 Salleh's Production vs. Reproduction

As argued by Salleh humans and nature are connected and human needs should be balanced with all living species where you only take what you need, as in a "natural" ecosystems where there is a balance of extraction and production from various species. Biodiversity farming can be seen as reproduction. It follows biological processes, using cultural practices and economic relations which are essential for humanity-nature relationship. The emphasises in biodiversity farming advocated by Navdanya is aiming to strengthening the relationship with nature, caring for all life and not only just yourself. Food security is to a large extent an issue of decision making, where Navdanya is advocating that farmers shall become self-sufficient, to ensure the livelihood for themselves and their families. This is achieved through their reproductive work, control of their own seeds, and not being dependent on the market for chemicals to treat pests and other diseases.

If farmers shall be able to be self-sufficient and achieve food security, they have to care for nature, and appreciate the value of all living species. Food security is obtained through practices of diversity, not relying on one single crop but rather follow nature's cycle, which often adapts better in extreme weather changes. The focus is a system aiming for reproduction as according to Salleh.

6.3 Salleh's Metabolic Value

According to Navdanya, biodiversity farming is to trust the traditional knowledge which is part of their cultural heritage, meaning to rely on indigenous seeds, which are local to the region as well as using traditional techniques such as bulls for ploughing, adding green manures to the soil for it to live. As argued by some of the interviewees, special traditional rice varieties function better in different conditions such as drought or high levels of salt. Also farmers become less dependent and less vulnerable to for example climate changes if the farm consists of varieties within crops and varieties between crops. This is how "natural" ecosystems operate, with diversity of species dependent and supporting each other creating metabolic value and avoiding disorder by its own reproduction. Navdanya argues the decisions about the choice of agricultural practices should be made at the farm and or by the farmers, who are close to and actually living with the crops and therefore able to see what actually happens. Navdanya works

to close the gap between farmers and scientists, or rather bring them together and work towards the same goal, in order to ensure food security with minimal destruction on nature.

6.4 Naess' Self-realisation and Deep ecology

Farming with nature is not a choice of a specific technique or practice that is related to biodiversity farming. Nature is everything, and by researching it or trying to understand the perception of nature, I am as a researcher creating a separation that the people which are working at Navdanya are not familiar with. This is indicating that they are most likely living in an ecological self, and by working at and with Navdanya, they have made the deep commitment that Naess talks about. This means that the critique, the inability of the industrial agriculture system to secure life of all living species, is the quest for a change of the system. Biodiversity farming as argued by Navdanya is a possibility to achieve food security, especially for small scale farmers, and to be able to adapt agriculture to extreme weather changes. To see the opportunities and to use knowledge from nature, as mentioned by Naess, could be considered as conditions of interdependency, where certain crops have the ability to adapt to different and changing climate. A farmer practicing biodiversity farming is not dependent on one single crop rather he or she secure him or herself by having several crops and varieties within the same species, such as several varieties of rice.

Sustainability and well-being of all, as according to Navdanya, requires a change that humans are not on top of a hierarchy and separated from nature. Humans are nature in embodied form and shall care and respect all life on earth. Profit can't be the main goal anymore, since it apparently can only be achieved at an expense of others. Navdanya is criticising the capitalistic system that it is based on natural resources to fulfil human needs and creates mechanisms that continue to exploit people. It could be stated that Navdanya has been able to influence a change in the agricultural system in India, where they have been able to strengthen small scale farmers, with farmers-training for about 900,000, by advocating traditional agricultural knowledge in India. It becomes clear that diversity involves the knowledge and understanding about living seeds, living soil and living for all species. It is related to Naess, when you realise that all living has a value within itself, that is livelihood for all living species. A notion of give and take. As Navdanya phrase it; to work with your hands, heart and head.

6.5 Discussion on further research

Navdanya could be a great example of a grass root movement, or an initiative to challenge the system which is in the hands of a few wealthy people. The inequalities in the world grows bigger and bigger, in 2017 Oxfam announced that eight of the wealthiest people in the world own as much as half the world (Oxfam, 2017). As mentioned earlier, that there is only ten big food and beverages companies which could be argued to control the food system as well as a few agrochemical corporations such as Bayer-Monsanto control chemical fertilizers and GMO seeds. From this standpoint it would be interesting to further research power relations and different actor's responsibility. It is connected to the dominant industrial agriculture and the lack of food security for especially small scale farmers.

The important aspect or role of Navdanya is to care for life, which means all life. As Navdanya means "Nine Seeds" and "New Gift" it would have been important to incorporate the meaning of seeds and the power struggle with it, which is very present in the Indian context, due to companies try to push and introduce GMO seeds in India. As stated by Vandana Shiva, seed is life and it is connected to the three biggest global issues; decline in agro-biodiversity, climate change and hunger. One might argue that Genetic Engineering and GMO seeds is just an attempt to control life, because it is a violation to take evolution and keep it in the "mind" of corporations. It is important to highlight that Indian law recognises farmers right; to sell, breed and save seeds. It is stated in Protection of Plant Varieties and Farmers Rights Act (PPVFRA), that you can't patent life. More exactly in article 3(j) it is mentioned what is excluded from patent; "plants and animals in whole or in any part thereof other than microorganisms; but including seed, varieties, and species, and essentially biological processes for production or propagation of plants and animals" (Shiva, 2017b). Despite that it is stated in the law, it is constantly challenged, big corporations are trying all the time to patent different seeds. Bt cotton is an example of how Monsanto in an agreement with Mahyco (hybrid seed company) illegally managed to enter India, and this has been devastating for farmers all over India.

To be able to have control over your own seeds, is what biodiversity farming is all about and it is through simple means of action such as to start saving seeds that could lead to change. A change in the livelihood for people and especially for small scale farmers but also the life of all living without destruction of nature.

Learn from small creators, to take small steps to create big change – Vandana Shiva

6.6 Personal reflection

A personal reflection, or an analysis of my participatory observation, is how long does an experience last?! The importance of nature becomes more prominent when I am in the context of Navdanya. I could follow the logic and see the “wonder of nature” and treat it with respect when I was there but now when I am back in my natural surrounding, I can’t help but wonder if I have detached myself from my experience, or is it deeply rooted, so when forced to act am I obliged to act in respect with nature?!

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8. Appendix

8.1 Interview Questions

1. Introduction

- a) Name
- b) Age
- c) How long have you worked at Navdanya?
- d) What is Navdanya to you?
- e) What is your main responsibility?
- f) Can you describe your day?

2. Agriculture

- a) How would you describe biodiversity farming?
 - What are the characteristics?
- b) Is it different from organic farming, if so how?
- c) How does Navdanya practice farming?

3. Climate

- a) What is nature to you?
- b) How would you describe climate change?
- c) Have you experience changes in the climate? If so how would you describe or can you share your experiences?
- d) What do you think is the main causes for climate change?
- e) Have you seen or experienced and effects of climate change on the farm work? And if so, what?
- f) How do you define a climate resilience crop?
- g) How is the process of selection?
- h) How many "new varieties" has been developed since Navdanya started?

4. Industrial Agriculture and GMO

- a) How would you describe Industrial Farming?
 - What are the main characteristics?
- a) How would you describe GMO crops/seed?

- b) What is your experiences of GMO?
- c) What is the different between plant breeding and genetically engineering of crops?
- d) Some argue that organic farming and or biodiversity farming require more labour what is your response to that?

5. Food

- a) What is food security to you?

6. Future, own perspective

- a) The goal of Navdanya for the upcoming 30 years is to make India 100% organic, how would you describe the process of it, and or the prospect of it?