Addressing Inequalities and Environmental Degradation in the Indian Economy

Exploring Policy Implications for achieving the SDGs

Development Alternatives Group
B-32, Tara Crescent, Qutub Institutional Area, New Delhi 110 016, India
Tel: +91 11 2654 4100, 2654 4200, Fax: +91 11 2685 1158
Email: mail@devalt.org, Website: www.devalt.org

Report by:
Technology and Action for Rural Advancement
A Social Enterprise of Development Alternatives Group
B-32, Tara Crescent, Qutub Institutional Area
New Delhi 110016, India
Tel: +91-11-2654-4100, 2654-4200, Fax: +91-11-2685-1158
Email: mail@devalt.org, Website: www.devalt.org

Core Team: Anshul Bhamra and Dario Kenner

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Introduction

This research was commissioned by Christian Aid, Oxfam GB, Save the Children UK and WWF-UK to improve understanding of the complex relationship between inequality and sustainability. This research will contribute to public discussion about the relationship between inequality and sustainability, and build towards policy and practice for change.

Objectives of this report

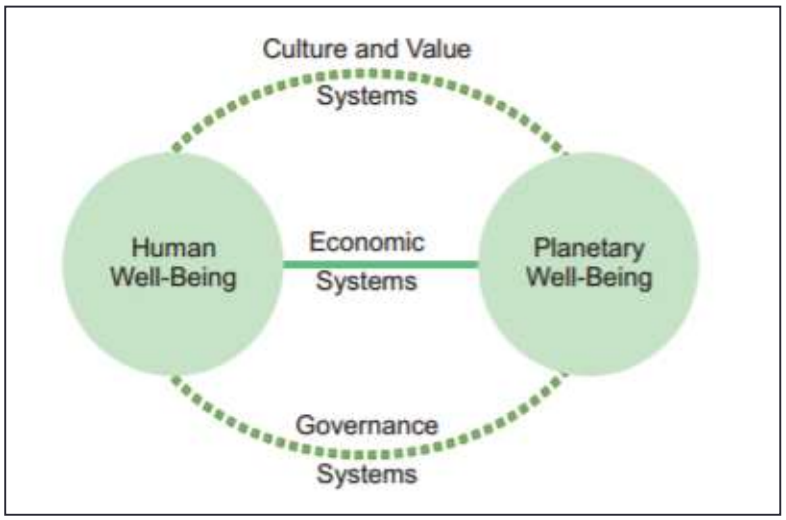
- To understand the nature of the interplay between inequality and sustainability in the Indian economy, with a particular focus on the agricultural sector.

- To identify opportunities for changing the policy regime for sustainable development, including addressing inequality and sustainability, to support the implementation of the SDGs and the Leave No One Behind agenda.

When measured using Gross Domestic Product (GDP) the economic model has been successful in India as it has posted high growth rates for many years.[1] But it has been accompanied by persistent poverty, widening inequality and huge damage to the environment. India's 12th five year plan covering 2012-2017 identifies the need for 'low carbon pathways of development' and 'integrated development approaches'.[2]However, Indian development planning processes have traditionally suffered from a siloed approach that does not integrate social and human development with ecosystems management.This study explores how economic development in India can ensure natural resource conservation and management while at the same time addressing inequalities. Throughout this report there is a particular focus on gender and caste as they are two of the most prevalent inequalities in India.[3]

The study uses an economic lens to explore the relationship between inequalities and environmental degradation in India. The basis of this study is that the type of economic model in place, with its associated patterns of production and consumption, has a huge influence on environmental sustainability and people's well-being. Other areas such as social and governance systems are also important in exploring how to address inequalities and environmental degradation but they are beyond the scope of this study.

Figure 1: Spatial arrangements of the systems in the development paradigm



Source: Development Alternatives

The first chapter begins by looking at how India's economic model based on environmentally unsustainable patterns of production and consumption exacerbates and interacts with inequalities. It examines the relationship between India's production patterns and inequalities. It also looks at how these production systems negatively impact the environment, including worsening air and water pollution. The final section explores unsustainable consumption patterns and how this interacts with environmental degradation.

The second chapterexplores the relationship and dynamics between inequality and the environmental sustainability in the agricultural sector. It looks at unequal access to land and water and how this affects farmers' incomes among other issues. The case study examines existing policies to identify opportunities for agricultural policies that are green and inclusive in nature.

2015 was a watershed year when countries around the world united in their commitment to the Sustainable Development Goals. Reducing inequality and protecting the environment are at the core of this agenda. This study provides policy recommendations for ensuring an economy that is green, inclusive, fair and transparent in order to reduce inequalities and promote sustainability.

Human and environmental well-being should be seen as the ultimate goal of development. Inequalities of opportunity, outcome, access and voice are detrimental to human well-being, while environmental degradation and resource exploitation contribute to poor planetary health. A new development paradigm needs to explore how to achieve development without crossing planetary boundaries. For too long economic development has been treated as an end and not a means to an end. Indian Nobel Laureate AmartyaSen has written about the normative approach which sees growth as merely having an instrumental value, as a means to the end.[4]KaushikBasuhas argued that "ultimately an economy has to be evaluated in terms of what happens to the poorest and the dispossessed. Everything else, such as a nation's income growth rate is of instrumental value".[5]

CHAPTER 1:
The relationship between inequalities and environmental degradation

1.1) Rising inequality

While the unequal distribution of the benefits of economic growth has been a key feature of the Indian economy since independence[6]the focus here is on the economic model adopted in the early 1990s because it has exacerbated "many deep-rooted forms of economic and social inequalities".[7] Since this time successive Indian governments have opened up the economy, increased the focus on exports, and placed an emphasis on role of the private sector via deregulation and privatization.[8]There has been a particular focus on promoting Foreign Direct Investment (FDI).[9]Successive governments have also promoted large-scale development projects to expand the Indian economy, often with a private sector role.

Between 2004 and 2010 India's economy grew by around 8.7% a year and the World Bank predicts an annual growth rate of 8% by 2017 (Press Trust of India, 2015). This has contributed to a growing middle class, defined as earning between US$2-13 a day, which in 2010 was around 264 million people. India is predicted to have the largest middle class in the world by 2050.[10]However, India ranks 130 out of 188 countries on the Human Development Index[11] and approximately 680 million people in the country cannot meet their essential needs.[12]

A feature of India's economic growth since the 1990s has been increasing inequality, including between states and between urban and rural areas.[13] The share of income captured by the richest 10% increased from 26% in 1993 to 30% in 2011[14]while according to data from Credit Suisse the richest 1% now own 53% of the country's wealth.[15]A common measure of inequality in India is the Gini index. It has increased from 30.8 in 1993 to 33.9 in 2009 signaling deepening inequality.[16] However, it is likely that the inequality is worse than the picture given by the Gini index. This is because new income based surveys show that while the poor consume almost twice as much as they earn the rich are saving more than they earn. This pushes the Gini index up to 51 points placing India at Latin American levels of inequality.[17] Oxfam has estimated that if India were to take measures to reduce inequality this could lead to 90 million people being lifted out of extreme poverty by 2019[18].

The economic growth model with a focus on GDP has led to large increases in wealth, infrastructure facilities, growth of transport, information and communication technology. However, GDP growth has not translated into increased employment opportunities, or when GDP growth adds job, these have often been low paid low quality jobs. Economic growth since the structural reforms which liberalised the economy in the 1990s has been 'jobless'. While agriculture employed 58% of the workforce in 2011 it accounted for 15% of GDP (see Figure 2). In contrast services employed 25% of workers and its share of

GDP was almost 55%.[19]Indian academic JayatiGhosh argues the type of economic growth currently being pursued has been based on private accumulation which has relied upon "existing social inequalities that create segmented labour markets that keep wages of certain social categories low".[20]The opening up of the economy was expected to increase the "employment intensity of growth" but what seems to have happened is that it led to an increase in "skill-intensive services rather than of labour-intensive manufacturing".[21]

The 2013 Economic Survey cautioned that by 2020, India could face 16.7 million 'missing jobs'.[22] It is mainly low-wage and insecure employment (no legal protection) with poor working conditions that has been increasing.[23]India now has declining productivity and a large informal sector which is estimated to be larger than the formal economy - approximately 75% of the rural and 69% of the urban workforce.[24] There is also a growing use of temporary and contract workers, as well as subcontracting of formal sector jobs. The formal economy and high-productivity sectors such as software industry are dependent on cheap labour and services from the informal sector which is characterised by extreme precariousness and poor working conditions.[25]

Figure 2: Jobless growth in 2011

Source: Development Alternatives

Box 1: Gender and inequality

Women are routinely discriminated against within the household and workplace.[26]India ranks 130 out of 188 countries on the Gender Inequality Index[27]and there are high rates of violence against women and girls[28]who suffer "routine domestic violence, acid attacks, rape, and murder".[29]In 2011 male literacy was 82% compared to a female literacy rate of 65%.[30]

There are lower rates of female participation in the workforce across income groups[31] and men are on average paid 2.5 times more than women.[32] The increase in economic growth has been accompanied by a declining number of women in work which is an indicator that women have less freedom, status and empowerment.[33]Whilst some women are leaving work because they are involved in education it is likely that the majority of women are restricted from participation in the formal economy by being forced to do unpaid 'invisible' domestic care work. Factors reducing participation of "self-employed" women in rural areas include increasing mechanisation of production, that their work is undercounted and also that environmental degradation is making it more difficult to collect fuel wood and water.[34]India's economic prosperity is also reliant on underpaying women.[35] For example, government programmes delivering essential public services such as health, child support and education often pay well below the minimum wage.[36] To highlight ingrained gender inequality ActionAid India focused on the invisible unpaid work of women in their Water Wives campaign that shows how men marry multiple women so that they can collect water.[37]

Box 2: Caste and inequality

Another feature of inequality in India is the caste system which sees certain groups suffering from "exclusion and dehumanization".[38] India is divided up into: Hindu forward castes (Brahmins, Kshatriyas and Vaishyas) and Other Backward Classes (Shudras), Scheduled Castes (also called "Untouchables" and Dalits) and Scheduled Tribes (also called Adivasis), there are also non-Hindu minorities such as Muslims.[39] An estimated two-thirds of Scheduled Castes and three-fourths of Scheduled Tribes live in multidimensional poverty[40], with these groups more likely to have malnourished children and lower life expectancy.[41]Entrenched discrimination violates Scheduled Castes rights to education, health, housing, property, freedom of religion, free choice of employment, and equal treatment before the law. They also suffer routine violence.[42]

Whilst there are indications that some members of Other Backward Classes have been able to improve their economic situation, overall Scheduled Castes and Scheduled Tribes have "substantially lower wealth than the 'forward' caste groups".[43]National Sample Surveys show that Scheduled Tribes, Scheduled Castes, Muslims and Other Backward Classes (in that order) have a much higher probability of being in low wage work and living in poverty compared to general 'caste Hindu' population.[44]While this is partly explained by unequal access to quality education it is also due to discrimination which determines job opportunities for different castes which means that lower castes are forced to do the same jobs for lower wages with the result that wages can be kept low even as they rise for others.[45]For example, lower castes, in particular Dalit women, are forced by their poverty or coerced into the practice of "manual scavenging"—cleaning of human waste from private and public dry toilets, and open drains which has become institutionalised as local authorities employ these people.[46]JayatiGhosh concludes that caste is an "extra-economic factor that acts in two forms, inequality of opportunity and inequality of outcome".[47]

In summary, the benefits of economic growth have not been shared equally. Instead they have been based on exclusion along class, caste and gender lines and exclusion from access to assets, decent jobs

and services such as education.[48]The lack of redistribution of assets (and land reform – see case study on agriculture) affects lower castes and women the most because they have the least in the first place. It seems unlikely that the current government will act to ensure the benefits of economic growth are shared more equally. Oxfam India has called on the Indian government to "oppose the special interests of the powerful elite" and to "ensure fair taxation, so those most able to pay contribute more".[49]One analysis of the 2016-2017 budget argues that the government has not dedicated sufficient resources to help vulnerable groups and is unwilling to raise corporate, wealth and capital gains taxes.[50]It sees fiscal deficit reduction as its main priority, in particular to satisfy foreign investors to continue the dramatic rise in FDI flows which rose by 39% between 2013and 2015.[51] Oxfam India has already argued that "more than half of FDI in India is channelled through tax havens" and that "money that can be invested to tackle inequality is diverted by tax breaks & public-private partnerships".[52]

1.2) Economic model damaging the environment and exacerbating existing inequalities

India's rapid growth has been accompanied by extensive damage to the environment including biodiversity loss, air and water pollution and rising greenhouse gas emissions.[53] According to the Global Footprint Network in 2012 India's ecological footprint exceeded its bio-capacity by 160%.[54]A key driver of this environmental crisis is the economic model pursued by successive governments (once again the focus here is on the period since the 1990s) which has included the promotion of large-scale development projects. These range from infrastructure, energy and mining projects which together have been "bad news for forests, coasts, farms and pastures" as they have led to deforestation and the destruction of ecosystems.[55]

These projects can exacerbate inequalities because they displace significant numbers of people from their lands without adequate compensation. This has negative impacts on the livelihoods of the poorest and women.[56] Lower caste tribal groups[57] are especially impacted with Amnesty International arguing that that those tribal communities with strong links to land and forests "have suffered disproportionately from development-induced displacement and environmental destruction in India".[58]In addition, 'water grabs' to build large dams have displaced some of the poorest people and restricted their access to water.[59]People living in rural areas are especially impacted which is significant because natural resources constitute a key part of the livelihoods of approximately 833 million people living in rural areas.[60]The most marginalised often depend on agriculture, forests, fisheries etc. for their livelihoods for their survival.[61]Community leaders, activists, journalists and also lawyers who question or resist these projects are increasingly being targeted and even killed.[62]

There is evidence that shows extractive industries in particular are exacerbating existing inequalities. Mining projects in rural areas have particular impacts on women such as taking away access to clean water. They also have negative impacts on men such as unemployment and alcoholism.[63] Lower castes living in forest areas, who are demanding land titles and rights over their forest resources, are often in

conflict with mining projects.[64] This is often for coal mining which has a range of environmental impacts including soil erosion and water pollution from acid mine drainage[65], which hits India's largely female rural producers.[66]It is estimated that around 60% of India's energy is generated using coal[67] and the government has plans to significantly increase coal production to meet growing energy demand[68], even if this is not as high as previously stated.[69] Amnesty International notes that around 70% of coal is located in central and eastern regions such as Chhattisgarh, Jharkhand and Odisha where over 26 million members of lower caste Adivasi communities live, accounting for nearly 25% of the Adivasi population in India.[70] Greenpeace argues that in efforts to achieve this goal the government has weakened environmental legislation, allowed mining in protected forests and expedited "land acquisition and approved mine expansions with negligible social or environmental assessment".[71] Another dimension of using coal to generate energy (in addition to the potent greenhouse gases) is that in India's North West it has not always contributed to reducing energy poverty.[72]

Box 3: Billionaire benefits: Favourable contracts and concessions for environmentally damaging projects

The number of Indian billionaires rose from nine in 2004 to forty in 2007, and reached one hundred in 2014.[73]Twenty billionaires are seeing their wealth increase from sectors that are "rent-thick". This is where a "return to a factor of production in excess of what could be obtained from an alternative use in a fully competitive activity".[74]These sectors include real estate, construction, infrastructure, cement, mining and the media. In terms of environmental impact infrastructure and mining (and cement mainly because of carbon dioxide emissions) are of most interest as they have contributed to environmental degradation (see section 1.2). The government often has a strong presence in these sectors which has allowed India's billionaires to greatly benefit from favourable government concessions and contracts, often associated with corruption.[75]

It appears the current government is intent on continuing large-scale development and is prepared to undermine environmental legislation to achieve this.[76] India has ambitious goals for industrial and infrastructure development projects which are projected to require close to 11 million hectares of land over the next 15 years.[77]The current Prime Minister Narendra Modi was elected to deliver greater "development"[78] and celebrates that India is now the fastest-growing major economy (measured by GDP).[79]

This is based on policies such as the Make in India initiative whose objective is a huge increase in manufacturing, deepening deregulation, making it easier to do business, tax reductions, and building more infrastructure and industrial corridors.[80]Several studies have shown that as part of this initiative labour and environmental regulations have been weakened in an effort to attract foreign investment.[81]Key to the Make in India initiative is the National Manufacturing Policy which seeks to promote National Investment and Manufacturing Zones which are "giant industrial greenfield townships" of at least 5,000 hectares (50 square kilometres). The government will provide almost all infrastructure needs and also states it will conduct environmental impact studies and bear "the cost of resettlement and rehabilitation packages for the owners of acquired land".[82]This fits with the

government's attempts to modify legislation to speed up land acquisition when it is for industrial corridors and infrastructure projects including Public Private Partnerships.[83]Mehta argues this will "pave the way for a new wave of land and water grabs, and the further dispossession of powerless and marginalised groups from their resource base".[84]A report by the Rights and Resources Institute and Tata Institute of Social Sciences has found that land-related conflicts in India affect about 3.2 million people and impact investments worth over US$ 179 billion.[85]

Levers of change to achieve the SDGs on inequality and environmental sustainability:

- **Community resistance and courts block development projects**

"These conflicts occur when bureaucrats and corporates gang up in the name of so-called development and break the law to grab natural resources, causing enormous harm to millions of people." - Shankar Gopalakrishnan, Secretary of Campaign for Survival and Dignity, an alliance of tribals and forest dwellers' organisations.[86]

While it is a reactive strategy it would appear one way to influence government policy is by organising and directly resisting these development projects which is what communities across India who fear losing their livelihoods are doing. Environmentalist Sunita Narain argues "for them the environment is not a matter of luxury; it is not about fixing the problems of growth, but of survival. It is fixing growth itself". They are questioning the development paradigm by saying "loudly and as clearly as they can, that what others call development will only make them poorer".[87]

There is a long history of this in India and some significant victories which show that resistance can be effective. Special Economic Zones (SEZs) were created in the 1960s as defined geographic areas that offered specific incentives to companies such as provision of infrastructure and tax exemptions on imports and exports. There are now over 100 SEZs.[88] While over the time they have generated jobs and export earnings[89] they have been criticised for dispossessing communities of their lands[90] and exploiting workers and the local environment.[91] Community resistance to SEZs during the mid-2000s, in some cases in response to severe human rights abuses, forced the government to cancel a project in West Bengal in 2007, introduce a temporary moratorium on SEZs and reduce their size.[92] Farmers successfully resisted a large-scale SEZ outside Mumbai that would have been used by Reliance Industries, owned by India's richest man Mukesh Ambani. In Orissa another SEZ for a South Korean steel company has been stalled because farmers refused to be intimidated by police surrounding their village and got media coverage which made removing them politically difficult.[93]

However, resistance even if it is organised does not always lead to success. The Indian government has plans to build 30 large, 135 medium and 3,000 small dams on the Narmada river and its tributaries which it claims will provide electricity and drinking water for many people.[94] Local communities have already suffered from existing hydropower and irrigation projects on the river which have flooded their villages and reduced fish stocks.[95]The Sardar Sarovar mega dam has been under construction since the 1980s and has forced approximately 225,000 people from their lands. The government plans to raise the

height of the dam by 17 metres which will potentially impact at least 48,000 families (240,000 people) and lead to a "large scale human tragedy" according to a 2015 fact finding mission.[96]While resistance to the project forced the World Bank to withdraw funding in the 1990s[97]and pressured the Indian government to provide some compensation and rehabilitate people (insufficiently as documented by the 2015 fact finding mission) the dam has still gone ahead.[98]

Legal battles

Following social pressure, the successive government introduced a range of laws that protect rights during the 2000s including the 2006 Forestry Rights Act (see below) which provide the basis for legal activism.[99]Following a decade long campaign the Supreme Court in 2013 sided with the DongriaKondh tribe to stop bauxite mining by Vedanta in the Niyamgiri hills.[100] The DongriaKondh have to date been successful because the Supreme Court ordered they should be consulted (they overwhelming rejected the project in a subsequent referendum on the project) and stayed united in the face of pressure and intimidation from paramilitary police. They could also count on international support from Survival International and Amnesty International.[101]The tribe have needed to stay vigilant as the mining company and local government are still pushing for the mine despite the Supreme Court rejecting their appeal in May 2016.[102]

The National Green Tribunal has been in operation since 2011 with a mandate to quickly resolve cases on environmental matters including enforcement of environmental legislation and compensation for affected parties.[103]This is in addition to the National Environment Tribunal established in 1995 to decide on liability and damages linked to hazardous substances.[104]Both these tribunals provide a legal framework within which environmental justice issues can potentially be raised and addressed.[105] For example, in 2014 the National Green Tribunal rejected approval by the Environment Minister Jairam Ramesh in 2011 for forest clearance for a coal mine in forests in Chhattisgarh state.[106]

There are some signs that the government is being forced to respect the 2006 Forest Rights Act which requires consultation with local communities. The latest example is a small Himalayan village which rejected a hydroelectric project in late 2016.[107] However, according to activists "thousands of projects have been executed in violation of the Act"[108] which highlights that laws by themselves are insufficient and require political pressure to influence outcomes.[109]This could be because it is difficult for regulatory bodies and the courts to keep up with the pace of industrial expansion which include "constructing dams in the remotest parts of Himalayas, sprinkling the entire coastline with port infrastructure, and mining out the central Indian forests".[110]Another factor could be the weakening of tools such as the Environmental Impact Assessment which are increasingly criticised by local communities for not conducting real free, prior and informed consultation.[111]

1.3) Air and water pollution exacerbates existing inequalities

The pursuit of resource and greenhouse gas intensive economic growth has significantly contributed to air and water pollution in India. In urban areas the drivers of air pollution include rapid urbanisation, the rising number of vehicles and congestion, coal-fired power stations and industry.[112]In the last two decades there have been over 30 modifications of the Environment Protection Act to promote industrial growth which has contributed to growing greenhouse gas emissions.[113]

The drivers of water pollution include dumping of domestic waste (e.g. sewage) and industrial waste (e.g. chemicals).[114]There has been a significant increase in water-intensive exports since liberalisation in the early 1990s which has contributed to increasing industrial water pollution, in particular from companies producing chemicals, dyes, paints, fertilizer, plastics, pulp and paper.[115]

Air pollution

Air pollution is worsening leading to around 1.4 million deaths in 2013[116] and India is projected to have the highest rate of mortality from air pollution by 2060.[117] Air pollution is a severe problem in urban areas with India currently having 10 out of the 20 most polluted cities in the world.[118]Research indicates that higher and middle income groups generated more air pollution in the country compared to other classes.[119]Several studies find that lower income groups are more affected by air pollution because of where they live, the fact they do not travel by car and so spend more time exposed to pollution, and due to existing poor health conditions which particularly affect the elderly.[120]Another factor is that the poorest often have less access to healthcare and have fewer resources to pay for these services.[121]In summary the economic situation and limited employment opportunities of the poorest forces them to spend more time living and working outside (exposing them to vehicle pollution), and also means they are more likely to live in slums next to industry as it is cheaper to live in these less "environmentally desirable areas" where companies face less political resistance.[122]

While it is difficult to completely escape the impacts of air pollution, air purifiers can be used to minimise it. Demand for residential air purifiers is rising rapidly, especially in major cities such as Delhi, Bengaluru and Mumbai where there are higher levels of disposable income.[123] But an air purifier is beyond the reach of the majority of the population. The cheapest one is 13,999 Rupees and the average price was 22,000 Rupees making this more expensive than a washing machine, microwave or a fridge. They are also costly to maintain because the filter needs to be replaced every few months.[124]

Water pollution

Water pollution is increasingly becoming a problem.[125] Water Aid India calculates that around 80% of surface water is contaminated, mainly by untreated domestic sewage.[126] Meanwhile an estimated 60% of ground water sources are expected to be in critical state by the 2020sas they are polluted with arsenic, fluoride, nitrate, iron, bacteria, phosphates and heavy metals from industry, fertilisers and pesticides used in agriculture, landfills and septic tanks.[127]

Around half of the population does not have access to clean piped waterand improved sanitation which is a contributing factor to the spread of disease such as diarrhoea which kills 300,000 children a year in India.[128]In Delhi residents across social class are affected by unreliable water provision. However, it is the poorest who suffer more, and especially women and girls because they are often responsible for accessing water.[129]

As with air pollution if a household has more wealth and resources it is more able to adapt. The richer the household the more likely they are to own a water purifier.[130] Those with more wealth can also afford to pay for bottled water.[131] In urban areas water shortages and concerns about unclean water and the spread of waterborne diseases is leading to growing demand for bottled water, in particular bulk sales.[132]

Levers of change to improve environmental sustainability and reduce inequalities:

- **Strengthen and enforce regulations to address air and water pollution**

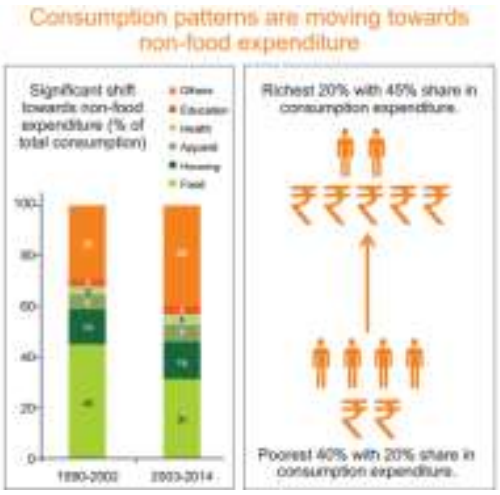
The National Green Tribunal has already made significant rulings on air pollution. In April 2015 the tribunal banned diesel vehicles over 10 years old and petrol vehicles over 15 years old from driving in Delhi, a controversial decision which was upheld by the Supreme Court.[133]In December 2016 the Supreme Court ruled that action should be taken on air pollution Delhi.[134] Nationally, the government is considering introducing fuel efficiency norms for passenger cars from 2017, increasing manufacturing of electric and hybrid vehicles, as well as upgrading mass public transport systems including a new bus rapid transit system.[135] These are all steps in the right direction that should be supported. However, as ever enforcement will be crucial.

In the area of water pollution there is a lack of regulation and enforcement[136] although this might be changing as the Central Pollution Control Board has issued regulations on wastewater discharge by utility plants and industry.[137]Despite water quality standards issued by the Bureau of Indian Standards water testing and treatment is not enforced due to a lack of resources and government funding.[138]

1.4) Identifying links between India's consumption patterns, inequality and environmental degradation

There are large differences in consumption between the rich and poor in India. Household expenditure surveys show that in 2011-2012 the average monthly expenditure by the richest 10% was 25,565 Rupees (31% of total) compared to the poorest 10% who spent 1,996 Rupees (2.4% of total).[139]India faces massive, multidimensional poverty. The proportion of the population living in extreme poverty declined rapidly from 47% in 1947[140] to 22% in 2012.[141] However, the absolute numbers have increased from 191 million in 1950 to around 270 million people in 2012, with around two-thirds of them living in rural areas.[142]

Figure 3: Consumption patterns in India in 1990-2002 and 2003-14



Source: Live Mint

Box 4: Unequal expenditure

Protein: In 2012 the average monthly expenditure by the richest 10% of people on meat, fish and eggs was 505 Rupees (19% of the total) compared to 67 Rupees (3% of the total) by the poorest 10%.[143]
Examples of environmental impact: Unsustainable agricultural practices (see Chapter 2)

Energy: The richest groups spend nearly one third times as much as the poorest in urban areas and twice as much in rural areas.[144]Richer people use more electricity because they have more appliances such as heating, lighting, TV, laptop, mobile phone, fans, air conditioning, washing machines and refrigerators. In contrast households in rural areas often do not have access to electricity.[145]
Examples of environmental impact: Greenhouse gas emissions released from electricity generation contribute to air pollution and climate change.

Transport: Nationally the richest quintile spends more on transport by plane, train, auto rickshaw and taxi than the other quintiles. There is a significant disparity of motor car, jeep ownership between urban and rural areas.[146] The richest people spend more on petrol and diesel. In urban areas this was by 30 times and in rural areas by 170 times.[147]
Examples of environmental impact: Air pollution from vehicles.

Differential consumption

While household expenditure is not a comprehensive way to capture environmental impact, because price does not always directly equate to use of resources[148], it is clear there are large differences in consumption which would indicate that the richest people have a larger environmental impact (see Box

4). Researchers have shown that this unequal consumption is also linkedto gender[149] and caste[150] with poorer and more marginalised groups consuming less, in part because they have smaller incomes (see Section 1.1).

Based on national statistics Oxfam estimates that the richest 10% of the households in India emit around 2.07 tonnes of CO2 per capita compared to the poorest 50% of households who each emit around 0.42 tonnes of CO_2 per capita.[151] Other studies also identify this carbon inequality.[152]One calculates that the emissions of the rich in urban areas are 15 times higher than those of the rural poor[153] while another argues that "during the last two decades of market-oriented reforms in India, urban elites have contributed almost fully to the increase in the inequality of emissions in the household sector" meaning that overall "elites in India are the major polluters both in an absolute sense as well as in per capita terms".[154] Although it should be kept in mind that national surveys often do not capture the consumption patterns of the richest and therefore their emissions might be underestimated.[155]

Box 5: Symbolic examples of carbon inequality

India's billionaires own luxury cars, helicopters, private jets, luxury homes and go on holiday in Swiss ski resorts and South Africa nature reserves.[156] The country's richest billionaires Mukesh and Anil Ambani reportedly own several private jets including the Boeing Business Jet 2, one of the most expensive at close to $70 million.[157] A key driver of this lifestyle is status competition (conspicuous consumption) as people seek to differentiate themselves as being in a higher class by owning luxury goods which is a growing market in India.[158] Some argue this is becoming more important than caste.[159]

One factor contributing to the unequal environmental impact from household consumption is the deepening disparity in income and wealth. There is a correlation between rising household income leading to higher carbon impact in India, a trend that has also been identified in other countries in the global south[160] and global north.[161] The poor have less money to spend and therefore cannot afford additional luxuries such as a private vehicle which contributes significantly to the household carbon footprint. For example, in urban and rural areas the households in the poorest segment of the population do not own their own vehicle. This is compared to 35% of the richest group in urban areas and around 13% of the richest group in rural areas owning a car or jeep.[162]The use of private motor transport is a significant factor explaining carbon inequality in urban areas.[163]

However, there are additional complexities to the relationship between income and emissions. In rural areas the poorest are restricted in what they can afford and therefore use highly polluting forms of energy such as fuel wood, coal and kerosene. Richer households can afford modern efficient cooking fuels such as liquefied petroleum gas.[164] This situation means an average rural household could consume as much as 30% more energy than urban households.[165]

Levers of change to reduce unsustainable consumption and reduce inequalities:

❖ **Targeting the environmental impact of resource intensive lifestyles**

The differences in consumption between rich and poor, and estimates of carbon inequality, mean the richest should be specifically targeted. There is also a moral argument to do so as it is not fair that a minority elite use up India's carbon budget when some people live on 0 or marginal emissions. There are a number of ways in which the Indian government could attempt to bring down the conspicuous consumption and carbon emissions of the richest people. These could include increasing taxes on luxury goods, meat, flying, private vehicles and fuel. The government could also reduce sales taxes on green goods and services such as electric cars and domestic renewable energy and storage to encourage the richest who can afford to "green" their lifestyles to do so.

Whilst there is evidence that consumption patterns in India are becoming more environmentally aware[166]this is nowhere near what is needed and the size of the market for green goods remains small, in part because these goods are more costly to produce as India is yet to green its production systems, and are therefore more expensive.[167]

The measures mentioned above to encourage pro-environmental behaviour could contribute to reducing the large resource use of the richest and crucially also of those below them. Grunewald et al argue India "has a large emerging middle class ready to spend its increasing discretionary income on a variety of emission-intensive consumption items".[168] This trend is starting to be observed. For example, Beinhocker argues that "average household consumption has been moving away from basic necessities to discretionary items"[169] and this can be seen in shifts away from food and beverages towards private vehicles, health care, education, communications (e.g. mobile phones) and recreation (see Figure 3).

❖ **Increasing clean energy access to reduce energy poverty and inequality**

Whilst the richest people in India spend the most on electricity (see Box 4) an estimated 260 million people in India, mainly in rural areas, do not have access to clean modern sources of energy[170]to meet their needs at home and at work.[171] This restricts their ability to improve their standard of living and to secure their livelihoods[172] by using energy for cooking, lighting, water pumping systems for drinking water and irrigation and flour mills.[173]

It can also mean they use highly polluting forms of energy such as fuel wood, coal and kerosene[174] which in India lead to around 1 million deaths a year from indoor air pollution.[175]Research shows that fuel wood collection particularly affects women as this time intensive activity[176] "limits opportunity for women's economic and social advancement and fulfilment of their rights".[177]The Indian government has ambitious plans to increase solar energy generation capacity by 100 gigawatts by 2020[178] and has received $1 billion in 2016 from the World Bank to support solar rooftop technology, infrastructure for solar parks, and transmission lines.[179]The Indian government should increase clean energy access for the poorest and marginalised by increasing the share of renewable energy in electricity generated for the central grid. This would have the additional benefit of reducing the heavy dependence on coal which is a driver of environmental degradation[180] (deforestation, air and water pollution) that hits the poorest and lower castes hardest (see section 1.2 on displacement), and is one of the largest sources of the country's

greenhouse gas emissions. The advantage of pursuing renewable energy such as solar and wind power is that these can also be decentralised energy solutions which can most effectively reach the poorest in rural areas.[181]Special attention should be paid to the role of women who can face barriers to participating in renewable energy projects "due to the lack of financial resources, social neglect, and inequities in resource management, education and technical training".[182] One way to overcome this is to train poor and uneducated women to be solar engineers as the Barefoot College is doing in north-west India with support from WWF.[183]

1.5) Policy implications for implementing the SDGs in India

The SDGs framework represents a shared global vision. It provides a framework to align national development trajectories with universally applicable sustainability indicators. The SDGs are complex but considering that poverty and environment concerns are multi-dimensional, the system to deal with them has to reflect this complexity. This is where India could benefit from the global framework and processes.Tackling inequality is a core part of the SDG approach. The idea that "no goal should be met unless it is met for everyone" (leave no one behind)is a key part of the SDGs agenda. Alongside this there is a strong emphasis on natural boundaries and sustainable land and water management.

The Secretary General's synthesis report focuses on a people-centered and planet-sensitive agenda to ensure human dignity, equality, environmental stewardship, healthy economies, freedom from want and fear, and a renewed global partnership for sustainable development. This should be the basis to transform the economy to ensure that everyone can meet their basic well-being while staying within the boundaries of our planet's ecosystems. Patterns of growth need to be more inclusive, sustained and sustainable. People want decent jobs, social protection, robust agricultural systems and rural prosperity, sustainable cities, inclusive and sustainable industrialization, and resilient infrastructure and sustainable energy for all. Reducing inequalities and ensuring greener economic pathways are central to this new development agenda.

A series of interviews were conducted in India with various expert stakeholders (see Box 6) to identify the key challenges the country faces in terms of severe inequalities and environmental degradation. These experts were also asked to identify levers of change at the policy level that could ensure the SDGs are used as an opportunity to redefine the development paradigm to ensure it is more egalitarian and environmentally sustainable.

Box 6: Interviews with expert stakeholders

Nisha Agarwal: CEO, Oxfam India

Chandra Bhushan: Deputy Director General, Centre for Science and Environment (CSE)

Ajay Mathur: Director-General, The Energy and Resources Institute (TERI)

Dr Mohan Gopal: Director, Rajiv Gandhi Institute for Contemporary Studies

PD Rai: Member of Parliament, Sikkim Democratic Front

Shyam Saran: Chairman, Research and Information System for Developing Countries (RIS)

Key challenges for India

- **Impact of different economic sectors**: Choices over which economic sectors to prioritise,to achieve goals such as supporting livelihoods and environmental sustainability, sometimes go against each other.The services sector is the least polluting and resource intensive. However, it creates relatively few jobs and is an area where capital tends to accumulate. Meanwhile manufacturing, or the secondary sector, usually creates more jobs but tends to be resource intensive and therefore there is the danger of exceeding ecosystem boundaries in a region. It is difficult to identify what the correct share of the secondary and tertiary sectors in the Indian economy should be that would: have high employment generation; and at the same manage its natural resource use when it has already overshot its capacity.

- **The importance of agriculture**: The agricultural sector was identified as one of the most instrumental sectors in moving towards a more sustainable economy that also reduces inequalities amongst people. It was widely seen as the sector with the highest livelihood dependence and largest natural resource use. The livelihoods in this sector are the most vulnerable to climate change and natural resource scarcity. If India needs to move towards sustainable development for people and planetary well-being, a focus on agriculture sector is vital.

- **Financial flows and technology - key levers for development**: It was identified that financial markets have the innate habit of maximizing their return. These markets are very sensitive to transaction costs and are therefore not involved in small transactions largely involving the poor. The nature of these financial flows blocks finance for the poor and the marginalised because of higher transaction costs - the low returns to such investments as well as the difficulty in approaching and tracking them. The challenge is therefore to incentivise finance to flow towards the poor who require development assistance.

  Technology has been a key feature of the move towards efficiency. One of the biggest challenges is to balance the replacement of employed people by an advanced technology that eliminates some jobs. Efficient technologies have in the past reduced the number of jobs created and projections, especially in the IT sector, predict a further reduction in number of jobs created in the future. The challenge is to choose technologies that do not concentrate wealth only in the hands of the few and which contributes to job losses in the Indian market.

- **Water access**: Natural resources in general, and water in particular, were considered a national problem. It was identified that market mechanisms of pricing water are perhaps not an appropriate solution as they harm the people at the bottom of the pyramid and promote the idea of over consumption if you can afford to pay. In addition, the fact that ground water is a private resource was identified as a key reason for exploitation of water in agriculture. The inequitable distribution of water has been a key factor in a range of issues including: drought, suicides and, inter-state river conflicts. This requires close attention in debates around sustainable development policy making.

- **Role of the private sector**: One of the key players in the economy – the businesses which are responsible for the resource use as well as for job creation - were criticised for being unaware of what it takes to pull people out of poverty. The social impact assessment and environment impact assessment should be core to their businesses model, not just as Corporate Social Responsibility. The lack of understanding and action by Indian business is a root cause of the continued increase in inequalities as well as environment degradation.

Levers of change: Actions at the Policy level to support the transition to Sustainable Development

The expert stakeholders identified several key action points at the policy level that could guide and trigger a change towards a more equal and environmentally sustainable society. In summary these are:

- ***Sustainable Production and Consumption to underpin all Government Programmes:*** The SDGs emphasise the need to set up sustainable systems of production and consumption which take into account circular economy models and governance of resource access. This is critical for government programmes such as 'Make in India', 'Smart Cities' and existing and new missions for climate change adaptation and mitigation.[184] Enforcing limits on the resource footprint of economic activities should be discussed and developed to establish a threshold for economic growth in each region of the country.

- ***Bottom-up Planning Systems***: There needs to be a transformation in planning systems to strengthen bottom-up village and urban planning processes. There needs to be a reduction in centralised schemes that often drive development agenda and budgets. Complex global sustainability issues should be integrated and tracked in decentralised development plans. Efforts should go in to building the capacity of local governments and increasing citizen engagement in the development process. Finally, there should be investments in data systems that are open, transparent and accountable and that track and report to citizens as well as to a global audience.[185]

- ***Merging of villages into 'townlets':*** A problem of high transaction costs and dispersed markets in rural areas could possibly be addressed by re-structuring villages in to consolidated living spaces called 'townlets'. These townlets would make quality basic need services and other development services available to communities at affordable rates. While the largest proportion of income generation would still be in agriculture these townlets could also generate significant employment in the service sector.

- ***Transforming the agricultural sector:*** The agriculture sector should adopt sustainable practices, high productivity to meet food security, focus on value-added produce, and ensure employment and income generation opportunities.

- ***Long term sustainability vision for finance and technology choices:*** Government decisions on and incentives for finance and technology should focus on long-term results that are good for people

and planet. This should replace the focus on quick short-term solutions to issues such as productivity and gross value for economic growth.

- ***Sustainability in the private sector:*** It is critical to mandate business, especially large companies, to publicly report on their resource use and their impact on people, livelihoods and natural resources as a result of their core business activity. Governments should use fiscal policy to incentivise businesses to implement good practice in terms of social and environmental impact.

- ***Measure incremental improvements:*** The changes required to address intersecting inequalities will not be achieved in a hurry: they require progress over a period of time. It will be useful to set out 'stepping stone targets' at the national level that address measurable group-based disparities in context, and set targets for the progressive narrowing of the gaps. For example, the gap in educational attainment between girls in marginalised livelihood groups and boys in urban centres.[186]

- Economic sectors should not only be evaluated on their contribution to Gross Domestic Product. Their entire value chain should be evaluated for its impact. Tracking progress should include indicators such as human well-being from employment opportunities, and whether a product meets basic needs and is produced in an environmentally sustainability way.

CHAPTER 2:
Addressing inequality and environmental degradation in agriculture

2.1) Context and dynamics

Unequal land distribution

According to the 2011-12 National Sample Survey Office report and 2011 census data, agriculture contributes 15% to GDP. As many as 570 million people (47% of the population, including 6.7% in urban areas), depend on the agricultural sector in India. Approximately 50% of land in India (around 140 million hectares) is under cultivation but is unequally distributed.[187]Just 5% of farmers control 32% of farmland. It is estimated that four million people, or 56% of rural households own no land.[188]The dalits and scheduled tribes in rural India face higher levels of landlessness due to the historical legacy associated with restrictions imposed by the caste system. They also face ongoing discrimination in the land market, capital market and other related economic spheres.[189]

According to National Sample Survey data from 2003 the incidence of landlessness was higher among Dalit households than among Adivasi households and unrecognised lower castes households. Around 56% of Dalit households did not own non-homestead land compared to 35% for Adivasi households and 37% for unrecognized lower castes households. The overall trend is that Dalit households are landless while Adivasi households have small plots of land with low productivity.[190]

Unequal access to water

India is one of the most water-challenged countries in the world with the national supply of water is predicted to fall 50% below demand by 2030and water quality is deteriorating.[191]Experts believe that India is rapidly moving towards a crisis of ground water overuse and pollution (see Figure 5). Agriculture uses more than 80% of the total fresh water available in the country.

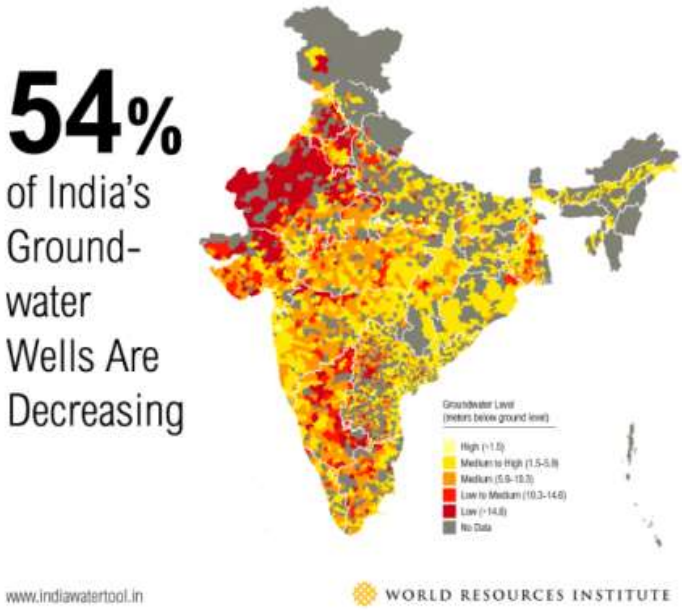
There are inequalities in the agricultural sector in terms of the availability of a reliable source of irrigation. For example, sugarcane is grown on 4% of Maharashtra's state's farms and yet it consumes 70% of water available for irrigation. According to India Spend no more than 1.1 million farmers grow the lucrative cash crop. In contrast, about 10 million farmers growing *jowar* (sorghum), pulses and oilseeds get no more than 10% of irrigation water. Most of the water is utilised in water intensive crops in Maharashtra because water is a private resource and farmers with adequate water supply go for water intensive crops. In this way, there are a small number of farmers gaining income by selling water intensive sugarcane which is a high value cash crop at the cost of the large number of farmers deprived

of water and therefore decent income opportunities through agriculture. There is a need to rationalise water use so that the choices of individual farmers do not worsen the overall water situation of the region. As a public resource it is critical that water is equitably distributed amongst all farmers to ensure resource equalities in agriculture.

About 15% of India's food production is currently dependent on unsustainable groundwater use. In rain-fed or drought-prone areas, where subsistence farming is more prevalent, increased competition between farmers reliant on available groundwater results in a spiralling cycle of well deepening or redrilling and the purchase of new pump sets. This has serious social implications for the poorest who can no longer afford such action and risk exclusion from access to groundwater for their irrigation and drinking needs. Overall, up to a quarter of India's harvest has been estimated to be at risk due to groundwater depletion.[192]

Women are particularly affected by water scarcity in India because they bear a disproportionate burden of fetching and carrying water. Indian women can take up to six trips a day to gather and transport water. These walks in rural regions can average ten miles a day, carrying up to fifteen litres every trip.[193] Therefore water scarcity and the depletion of groundwater leads to higher physical stress for women in rural areas.

Figure 5: Mapping India's Growing Water Risks



Source: World Resources Institute, 2015[194]

Unsustainable agricultural production practices

Traditional food habits developed over generations meant it was common for people to eat fresh, locally produced seasonal food that relied on rain water and had few chemical inputs. A driver of unsustainable agricultural practices has been the shift in crop production linked to government incentive schemes and new technologies introduced during the green revolution in the late 1960s.

The expansion of cities and increasing global connectedness after the 1990s resulted in a drastic shift towards high value, water-intensive and energy-dense foods such as, superior cereals, meat, dairy products, temperate vegetables and fruits, as well as crops such as cotton and sugar.[195]Diets changed as consumers wanted fashionable and water-intensive crops such as rice and wheat instead of traditional millet. Crops that are not suitable to the agro-climatic zones they are grown in has led to unsustainable practices and the exploitation of natural resources.

This shift in agriculture over the last 40 years has seen a move away from traditional agriculture towards commercial production systems with high water use, fossil-fuel-based agricultural inputs and high energy intensive machinery.[196]Higher prices for crops such as rice, sugar, cotton contribute to increasing incomes for farmers. However, growing these water-intensive crops can lead to greater risks of crop failures and reduced water availability for other crops. This is particularly the case for farmers in water stressed areas who are often the poorest in the country. The result is that richer consumers gain the benefits from water intensive crops while the costs are felt by farmers in water stressed areas as they risk their natural environment and financial capital on these crops.

Analysis of results from multiple long-term fertiliser trials in rice-wheat systems have revealed the gradual deterioration of soil health and thus long-term productivity due to overuse and imbalanced use of synthetic fertilisers.[197]This has meant that small farmers moving from traditionally made locally available fertilisers to chemical fertilisers and pesticides are incurring higher cultivation costs. Seeds, fertilisers and pesticides bought from the market increase the risks to the farmers' livelihood due to two key reasons. The farmer becomes dependant on external factors and therefore cannot control the costs and assess the quality of seeds and fertilisers based on his traditional knowledge. Second, greater risk due to higher investments costs of inputs compared to traditional available alternatives. If a small farmer does not have large capital for investments they become dependent on loans and other lending services which further increases the costs and the risks involved in agriculture.[198]Credit and investments are often a problem for small farmers and especially the poorest. In comparison large farmers are able to save and secure credit availability for agriculture investments. Large farmers, unlike the small and poor ones, are also able to diversify risks due to land size and the different crop choices on their land.

Various studies show the detrimental impact of pesticide use on health of the soil, the farmer and the consumer of the product. A 2013 study by the Food Safety and Standards Authority of India showed how most common food items contain banned pesticides in quantities that are several hundred times over the permissible limit.[199]Organic food generally costs 20 to 30% more than the conventional food items which restricts it to affluent population in cities.[200] Organic food consumption is not even 0.1% of India's

annual food consumption that is worth US$300 billion.[201]In this way, the pesticide free organic food is only accessible to the affluent population, leaving the poor without options of choice for healthier food choices. The organic food market is expanding by 19% a year,[202]largely attributed to the increasing awareness amongst consumers for pesticide free food. The majority of the demand for organic food is originating from cities such as Mumbai, Delhi, Chennai, Bangalore, Gurgaon and Pune.

Box 7: Unsustainable agriculture in Punjab[203]

The type of agricultural production in Punjab state highlights the negative impact on the environment and on poor farmers. Punjab state, with 5.2% of India's cultivable area, produces 11% of India's food grains and contributes about 45% of wheat and 25% of rice to India's central food pool. Punjab recorded the highest food grain yield in the country at 4,409 kgs per hectare in 2013-14. Fertiliser consumption in the state is the second highest in India at 216 kilograms per hectare.

However, this model has polluted water with 110 out of 137 groundwater blocks in the state classed as 'over-exploited'. It is also very energy intensive. Agriculture in Punjab state accounts for 31% of the state's electricity consumption, compared to the 17% national average. Farmers in the state have over-invested in agri-machinery. The 500,000 tractors in the state are double the number that the state needs.

The farming system promoted by the Green Revolution has been resource-intensive, while making Punjabi farmers heavily dependent on exterior inputs such as chemical fertilisers. This has led a large number of small farmers to leave the agricultural sector. In summary despite being the grain basket of the country, farmer suicides in Punjab expose the extreme rural plight that is otherwise side-lined by the dominant narrative of a prosperous Punjab. The risks involved due to weather and resource stress, coupled with loans for capital invested in agriculture has led to Punjab having the second highest suicide rate in 2015. If these risks to the agrarian economy in Punjab state are not addressed properly they may pose a severe challenge to its sustainability and food productivity in the region.

Marginal farmers receive less income

A comparison of incomes, expenditures and savings of different farmers in the table below highlights the inequalities within the sector. What a large farmer earns on an average in one month is the same as what a marginal farmer earns in 8 months. There are several factors at play here including unequal land and water access, problems in access to markets to sell produce, availability of credit and technologies to increases productivity.

Table 1: Status of marginal, small and large farmer in India (Source: NSSO)

Item	Marginal Farmers	Small Farmers	Large Farmers
Land Holding	Up to 1 ha	1-2 ha	Over 10 ha
Proportion of All Farmers	75%	10%	0.24%
Share of Land Owned	30%	24%	6%
Average Monthly Income	Up to INR 5247	INR 7348	INR 41388

Average Monthly Expenditure	Up to INR 6020	INR 6457	INR 14447
Average Investment in Productive Assets	Up to INR 540	INR 422	INR 6987
Average Savings/Deficits	Up to (–)INR1500 deficit	INR 469	INR 19954

Source: 2011-12 National Sample Survey Office report

Comparing incomes from agriculture with other sectors of the economy highlights the lower rates of pay. Between 1970 and 2015 the Minimum Support Price (MSP) for wheat increased 19times. In comparison in the last 35 years, the basic salary of government employees has increased by as much as 150 times, for college teachers and university professors by as much as 170 times, for school teachers by up to 320 times and for top corporate executives by almost 1,000 times.[204] These income inequalities highlight inequality in access and opportunity (access to natural, financial, physical, human and social capital) which help to determine the extent to which a farmer can benefit from agriculture.

Despite income inequalities between agriculture and other sectors, the shift of labour from agriculture to other sectors is less likely in the near future because jobs creation outside of agriculture sector has not matched India's levels of economic growth.[205]A study by CRISIL indicates that insufficient employment creation in the Industry and Services will result in more workers being locked in to the agricultural sector, the least productive sector with the lowestwages. The study estimates that a net 12 million people will join the agriculture workforce by 2018-19. This is compared with a decline of 37 million in agriculture employment between 2004-05 and 2011-12.[206]The production conditions prevailing in Indian agriculture, with its reserve army of labour, make it highly unlikely to expect any significant movement towards organised employment in agriculture.

"Development" Projects versus Agriculture

The unequal distribution of land is exacerbated because existing agricultural land is under increasing pressure for rapid economic and industrial development (including infrastructure expansion) linked to the rising population and urbanisation. According to the Ministry of Agriculture nearly 3.16 million hectares of agricultural land was converted for non-agriculture use between 1991 and 2012.[207]The demand for land from other sectors is projected to increase rapidly in the years to come. For instance, it has been estimated that land required to fulfil the urban housing need by 2022 will be around 1.7-2 million hectares.[208]

The construction of large dams for the water and electricity needs of the urban and industrial centres have deepened inequalities as they have deprived the people at the bottom of the pyramid, of the natural resources which they are most heavily dependent on for their livelihoods. The issue of worsening water inequalities can be closely associated with the wave of large-scale dams built in India which has been a central component of the development model since independence. Tehri HEP is a massive 261 metre rock-and-concrete power plant that supplies large amounts of electricity as well as drinking and irrigation water to the greater part of northern India, including the country's second-most

populous city of Delhi. The project involved the creation of a large reservoir that inundated the town of Old Tehri, along with approximately 110 villages, displacing between 50,000 and 100,000 people. The construction of a reservoir deprived low lying areas of river water procurability and increased the risk of flooding in nearby areas. The choice was between power and water availability for around 600-800,000 people in urban cities compared to around 1,000 local people who were displaced and many more in the surrounding area who suffered due to biodiversity loss.

Since independence the Indian state has continued to follow two principles from the colonial state: Firstly, the approach of centralised top-down management of water resources; Secondly, the reliance on and promotion of 'modern' technologies as a path towards development. Jawaharlal Nehru, the first Prime Minister and the architect of India's development model, had immense faith in the role of science and technology and the need for infrastructure to develop India. Visual landmarks were considered as the modern symbols of development leading to what is referred to as 'development monumentalism'. Nehru added the Indian flavour to the aesthetics of modernity by calling dams the "temples" of modern India- a place of prayer and worship of God. This continues to be the overall narrative of development even after more than 60 years of independence.[209]

Inequalities in land resources have worsened with land acquisition from small and marginal farmers for the state development agenda. The recent Amravati Case highlights the issue of land acquisition. The bifurcation of the State of Andhra Pradesh in 2015 led to the creation of Telangana including Hyderabad, leaving the residual state with 13 districts. Chief Minister Chandrababu Naidu has proposed to build a new greenfield capital in Amravati. Social activist EAS Sharma (Former Secretary, Economic Affairs, Ministry of Finance, Government of India) challenged the approval of Environmental Clearance at National Green Tribunal by the SEIAA for setting up of the capital in the area of 217,234 square km covering 23 villages in Thulluru, Tadepalli and Mangalagirimandals in Guntur District. The petitioner said that the development of the capital city was being done on richly fertile land in an ecologically sensitive area where there were unidentified wetlands, forests, islands, streams and the river Krishna. EAS Sharma contended that rules had not been followed while acquiring fertile agricultural land and wetlands.

A darker and angrier dimension of the narrative emerges where Mallela Harindranath Choudhary, a farmer leading opposition to the project, said, seething with rage and despair: "Farmers are appalled that a leader who walked through their villages for votes before the elections, promising to be a true *RythuBidda* (son-of-the-soil), has once again betrayed them. The State government, instead of taking the Centre's permission to de-notify degraded blocks of forests, has decided to force land away from the farmers in the most fertile agrarian belt in the country." According to him, the land is so fertile that farmers sow three crops a year in the region.[210]This case reflects the fact that the state favours large investment infrastructure led projects over the low GDP-yielding sector such as agriculture. This case also highlights the difference in bargaining powers of different classes in India. Despite protests against transforming fertile land into a concrete city, the state went ahead with their plan to build Amravati as the state capital.

2.2) Levers of change to implement the SDGs

Policies that can improve well-being and environmental sustainability in the agriculture sector

Redistribution of land

There needs to be better and more equitable access to land and water resources by all farmers, especially the small and marginal farmers with limited availability to these resources. Redistribution policies would provide land to the communities that depend on it for their livelihoods and who do not hold property rights. The Forest Rights Act 2006 was meant to contribute to the empowerment of tribal people (lower caste Adivasis). Under this Act the Adivasis and others living in Protected Forest Areas were due to receive land titles over the areas they already had possession over and were cultivating. While the Act is a commendable step, there have been bottlenecks in its effective implementation.

In January 2012, out of 92,406 claims in the state of Uttar Pradesh, 74,701 claims (i.e. 81% claims) were rejected. The result was that only 17,705 claims (19%) were accepted and 13,977 hectares of land was distributed. The situation is equally dismal in the state of Gujarat. By April 2016, under the Forest Rights Act, out of 190,097 claims only 77,038 were accepted and only a total of 1,192,351 hectares land was distributed. As such 65% of the claims were rejected and only 35% claims were accepted. That is why in Gujarat Dalits and Adivasis had to launch a 'Land Right Agitation' legal case demanding 5 Acres of land to each landless family.[211]

A key issue slowing redistribution of land is the conflict between mining projects and the conservation of important areas of biodiversity on which tribal people depend for their livelihoods. The Government has usually seen such conflicts as the conventional debate between development and environment with biodiversity conservation seen as a barrier to India's development. An emblematic case is that of Western Ghats which is an extensive region spanning over six states and hosts India's richest wilderness in 13 national parks and several sanctuaries. Recognised by UNESCO as one of the eight most important biodiversity hotspots of the world, these forested hills are also the source of numerous rivers, including the Godavari, Krishna and Cauvery.

The Ministry of Environment and Forests of India set up an expert panel in March 2010 to find a strategy to conserve these Ghats. The Gadgil Report published in 2011 was criticised for being anti-development, as it designated a large area as ecologically sensitive and restricted development activities in those regions. For example, it placed heavy restrictions on the sand mining and quarrying activities in the area. The report emphasised the importance of a decentralised process for decision making and governance in these protected areas. In one interview with the Hindustan Times, Madhav Gadgil, the chairperson of the committee, said: "I think all governments, state and centre, are working with narrow vested interests. There is clear evidence that they are trying to protect the interest of builders, quarry and mine owners and that their decisions are being controlled by them. The governments have refused to be responsive to the people, who have a constitutional right to decide what kind of environment they want

to live in".[212] The government often makes pro-"development" and pro-mining decisions against the protests of environmentalists and the tribal people who are dependent on these bio-diverse areas for their livelihoods. This is often because of strong lobbying by industries that are able to influence government decisions by using their political and economic power.

Expansion of Common Property Resources (CPR)

Approximately 48% of Indian Households collect CPR products like fuel-wood and fodder.[213] The rural poor (small farmers and landless labourers) with limited alternatives increasingly depend on low paid options offered by CPR. The expansion and productive use of CPR for collective use is a critical policy to address land inequities in agriculture because it evens out the barriers of resource scarcity by creating common grazing and pasture lands. Notwithstanding monitoring and measurement complexities, some of the benefits derived from CPR in the dry regions of India have been quantified in previous studies. An estimated 15% of India's 3.1 million hectares of land area is categorised as wasteland. The management and maintenance of wasteland as CPRs for use by small farmers, marginal farmers and the landless will enable the bottom of the pyramid to have better access to resources. In addition these areas can be used for forestation and maintaining the natural system balance in the region.

Farmers' joining forces

Farmer community institutions have been identified as a keypoint for small farmers to benefit from market conditions by increasing the scale of their business to provide a growing income for farmers. In some cases these institutions have also driven the community towards better management of natural resources and moving towards sustainable practices of agriculture. These institutions vary in their nature and functions. Some of the most common ones are Farmer Producer Organisations, Self-Help Groups, Panchayati Raj (village council) Institutions and informal community groups. Some of the primary functions that they perform across the value chain include water budgeting and natural resource planning,[214] technology choice and use,[215] crop choice,[216] input supply,[217] and value addition and market linkages.

Tool to facilitate or restrict land grabs? The land acquisition act

The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (also known as Land Acquisition Act, 2013) is an Act of Indian Parliament that regulates land acquisition and lays down the procedure and rules for granting compensation, rehabilitation and resettlement to affected citizens. The Act has provisions to provide fair compensation to those whose land is taken away and ensures rehabilitation for those affected. It also increases transparency around the process of acquisition of land to set up factories, buildings, infrastructure projects. The Act establishes regulations for land acquisition as a part of India's massive industrialisation drive driven by public-private partnerships. The law continues to be debated because of the controversial changes that the government had sought to bring about, that critics argue would reduce the need for consent of affected people.[218]

"Development" has had significant costs for the poor and politically weak. Official estimates place the number of people displaced due to development projects since Independence at 60 million, less than a third of whom have been properly resettled. Most of the displaced are the asset-less rural poor, marginal farmers, poor fisher-folk and quarry workers. Given that 90% of India's coal, more than 50% of most minerals and prospective dam sites are mainly in Adivasi regions, there has been, and is likely to be, continuing tension over issues of land acquisition. The possibilities of a more fair and decentralised democratic way of land acquisition has been proposed and advocated by various development experts. However, higher costs, long detailed processes and poor governance allows private players to choose far easier and quicker ways to acquire land.[219]

Agriculture practices that respect the environment

Environment sustainability in agriculture systems are maintained by ensuring proper management and quality maintenance of natural resources, especially land and water. Agriculture practices that retain the soil health of the land are considered to be positive to environment sustainability. In this regard, cases of crop diversification ensuring cycle of soil nutrient consumed by a crop allow the soil to rejuvenate and hence help in maintaining the soil quality. Further, use of fertilisers, in alignment to maintaining the nutrient quality of the soil is considered to be environmentally unsustainable. The WADI model, promoted by NABARD[220] in India, is an agro-forestry model that promotes environmental sustainability. WADI means an orchard. A WADI plot usually covers one acre per beneficiary who must be a marginal farmer not having more than 5 acres of land. Two or more crops are strategically selected for intercropping in the WADI model to minimise climatic, biological and marketing risks. In this model, a combination of species is selected such that they are suited to the agro-ecological conditions.

Optimum productivity levels are achieved through selection of early fruiting and high yielding varieties and adoption of improved farming techniques such as integrated farming systems, organic fertilisers and pesticides and crop rotation with legumes to enrich soil nitrogen levels. When the soil is adequately fertile, triple tier cropping is adopted. In this model, three crops are grown simultaneously on the same plot with one underground crop such as sweet potato and one canopy level crop such as papaya grown along with the usual above-ground crop of cereals or pulses or vegetables. To ensure irrigation, water resources are developed by creation of farm ponds, wells, farm-bunds and cattle protection trenches. The trees are able to withstand short term adverse weather conditions unlike seasonal crops, making the WADI relatively climate resilient compared to traditional agriculture. The organic practices adopted improve the soil organic content and nutrient recycling. The soil conservation measures, along with the root network of the trees leadto reduced runoff and soil erosion and improved ground water recharge. Pruning of fruit trees and border plantations provides a sustainable supply of fuel and fodder leading to reduced extractive pressure on the forests allowing them to regenerate. An important co-benefit of WADI is that it contributes to climate change mitigation by converting atmospheric carbon into tree biomass and soil carbon that act as long term carbon sinks.[221]In this way, WADI is environmentally sustainable and generates an income for small and marginalised farmers with scarce land, water and other resources.

Promoting equal access to water resources

Inequalities in access to water can be addressed by various mechanisms. Providing access to water for irrigation to small and marginal farmers, sharing of water resources for effective water management and efficient water technologies for irrigation can support the availability and access to water for small and marginal farmers with scarce resource access. The Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) policy was launched in 2015 for a period of five years, with the aim of boosting irrigation facilities for all. The motto of the PMKSY is “Har Khet Ko Pani” and “More crop per drop”. The scheme will coordinate the ministries, departments, agencies and research and financial institutions engaged in the creation, use, recycling and potential recycling of water under a common platform so that a comprehensive and holistic view of the entire “water cycle” is taken into account, and proper water budgeting is done for all sectors, namely, household, agriculture and industries.

The PMKSY envisages an end-to-end solution in the irrigation supply chain based on water sources, distribution network, efficient farm level application and extension services on new technologies and information. It will focus on improving water use efficiency to reduce wastage and increase availability both in duration and extend and bridging the gap between irrigation potential created and utilisation. Special emphasis will be on creating protective irrigation by harnessing rainwater at the micro level. For the PMKSY to address water inequalities in agriculture, it must consciously aim to address the water access of small and marginal farmers, especially in semi-arid and dry regions where rain-fed farming is risky with higher chances of crop failures. To achieve this, more emphasis and investments need to be done in small and micro irrigation projects over major and medium irrigation projects than is being currently budgeted for in the national accounts.

Water sharing

Water sharing is one way to address inequalities in water access. From this perspective water is seen as a community resource. This is based on the fact that water tables and water management are beyond the scope of one farm management and instead should be collective practices. Hivre Bazaar is a village in the state of Maharashtra where communities make watershed management and equitable access to water a priority. Watershed programmes for conservation and management are undertaken collectively by the community. To institutionalise the sharing of water, the village introduced a practice of water budgeting about five years ago. Using a ‘water bank’ principle, the budget ensures that the village does not draw more water than it stores in a year, and a small amount is kept in reserve. Watershed programmes can be inherently inequitable as they primarily benefit those who own land and the benefit usually increases with landholding size. They also distribute costs and benefits unevenly with disproportionately higher benefits realised downstream.

In practice land and groundwater rights are not separated. There is little incentive then for poor or landless villagers to participate in watershed development. In HivreBazaar the panchayat took further steps to actively assist those who did not benefit directly from the programme. For instance, a sudden and complete ban on open grazing would have an adverse impact on landless people who rely on

common pastures. Similarly, the tree-cutting ban was imposed incrementally beginning with forest land then moving to other areas. Notwithstanding these efforts, the landless had to spend additional time and effort in collecting fuel. The government banned the sale of village land to outsiders and gave landless people first priority to purchase land. Together with livestock loan assistance and sharecropping, this measure helped some landless families buy land.[222]

Saving water resources

Environmentally sustainable agriculture practices will maintain the water table and water cycles. Appropriate crops as per the agro-climatic zones and water availability in the region, prevents exploitation of the resource base and is therefore environmentally sustainable. Rain water harvesting, watershed management and application of other water conservation techniques are further improving the sustainability of water resources in the region. The Millet Programme of Timbaktu Collective in the state of Andhra Pradesh in India is an example of a region appropriate choice of crop and agriculture practices which maintain water balance and environmental sustainability. The guiding principle of Timbaktu Collective's work is simple: 'Let nature guide you and nurture your agriculture'. The choice of crops and the farming techniques promoted by Timbaktu are driven by the criteria of its suitability to the soil, water and climatic conditions.

In the era of imperfect markets and certain policy influences, Timbaktu is re-creating faith in traditional crops and traditional knowledge in the rural communities of Andhra Pradesh. Beyond the choice of crops, the Collective has revived various techniques of practicing agriculture using naturally available ingredients. This has not only enhanced soil health but also reduced the total cost of cultivation for farmers. Millet cultivation has taken a high priority in villages where Timbaktu Collective is working with the farmers. This is due to its high calorific value, high suitability to weather, soil and water conditions of the region. Lower costs of cultivation and easier pest management are other factors that make millets a good choice for the farmers in this region.[223]

In this way, agriculture practices that ensure maintenance of water table and conservation of surface water support the poorest of the farmers who are usually facing resource scarcity due to the private nature of water access. Such practices, as promoted by Timbaktu Collective also ensure environmental sustainability. The poorest and the marginalised are most dependent on natural resource endowments such as soil quality and water availability because they usually do not have alternative options or access to technologies which can be expensive. The conservation of resources, therefore, supports the poor and the marginalised farmers the most.

Table 2: Summary of policies that could address inequalities and environmental sustainability in the agriculture sector			
AGRICULTURE SECTOR		**LAND/SOIL**	**WATER**
[Levers of change to] Address Income Inequality	**Improves**	• Redistribution of land • Expansion and productive use of Common Property Resources • Land sharing for optimal utilisation • Land ceilings	• Irrigation access for small farmers, especially in low rainfall areas • Sharing of water resources • Water use efficiency
	Worsens	• Acquisition from small and marginalised farmers • Population explosion and distribution of land in families	• Water transfer for urbanization • Water intensive crop choice
[Levers of change to] Address Environmental Sustainability	**Improves**	• Natural fertiliser replacement • Crop diversification • Protection of biodiversity in soils and forests	• Region appropriate crop choice • Rain water harvesting, watershed management • Water-efficient production technologies
	Worsens	• Excessive fertiliser and pesticides use • Water and soil erosion due to flooding	• Water intensive crops • Water pollution

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