

Agrarian Crisis in Jharkhand: Results of a Farmer Survey



B.I.R.S.A. MMC

Bindrai Institute for Research, Study & Action, Mines Monitoring Centre

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Executive Summary

This study highlights some of the dimensions of the agrarian crisis faced by Jharkhand's farmers. The report begins with a review of literature that shows how successive governments have failed to address farmers' needs, such as for irrigation facilities, procurement of produce at a minimum support price, or creation of off-farm employment opportunities in rural areas. Agricultural development is still understood by government agencies and scientists to mean following the path of the earlier Green Revolution, which is a sure recipe for creation of dependency, debt and suicide among farmers, as well as poor health, loss of agro-biodiversity, and damage to the environment. Whereas the Green Revolution of the 1960s and 1970s provided a heavily subsidised seed-fertiliser package to farmers who had assured irrigation, the current private sector led agricultural paradigm includes none of this, but instead forces poor, mostly subsistence farmers into a costly and unsustainable mode of production.

This study, based on a survey of 493 farming households spread across 11 districts, shows that a vast majority of households are happy with farming as an occupation and almost all farmers want their children to continue farming. The majority of farming households grow cereals, pulses, oilseeds and vegetables; and on average a household grows 10-11 different crops. Paddy, maize, and wheat are the most grown cereals, whereas farmers are shunning nutritious millets like maduwa (finger millet) and gondli (foxtail millet). Kurthi (horse gram), urad (black gram) and rahar/arhar (pigeon pea/red gram) are the most grown pulses, and sarso (mustard) and sargunja (niger) the most grown oilseeds. The study highlights how the introduction of F_1 hybrid seeds has drastically reduced availability of local seeds across much of the state. For example, half of the study's households purchase F_1 hybrid rice seed both from foreign and Indian multinationals. Many smaller Indian companies are involved in the hybrid business too. Farmers worry about shortage of local seed for all crops, for reasons including cost of hybrid seed, loss of independence, and lack of quality/taste of hybrid produce.

Jharkhand's agriculture can no longer be said to be by default organic. Due to the promotion of high yielding varieties and F_1 hybrid seeds by the government, non-government and private sectors, most households have used chemical fertilisers and three-quarters use chemical pesticides on their crops. Farmers apply pesticides without using protective clothing, and often apply the wrong types too. For example, pesticides approved for use on cotton are commonly sold to farmers to apply on vegetables. This sector is unregulated and the retailers too are under-informed or ignore the approved uses and waiting periods of the various pesticides. Much of the vegetable produce reaching consumers' plates is laced with the residues of toxic, illegally applied pesticides. These and other forms of pollution from industry also pose a threat to the food items households collect from their surroundings, like types of wild saag and fish. The sector needs regulation, and farmers need training and support to reduce their dependence on these chemicals.

53 percent of the study's respondents are classified as marginal farmers (owning less than 1 ha), 38 percent small farmers (1-2 ha), and 7 percent medium farmers (2-5 ha). This study also takes into account cultivated farmland officially classified as forest land, gairmazrua (g.m.) land, and share-cropped or contract land. In total, these land types add 231 acres to the total area cultivated by the 493 sample households; which is 17 percent of the total cultivated area. On average this translates to almost half an acre per household. Inclusion of these land types brings the average cultivated area from 2.31 to 2.78 acres per household, and increases the proportion of medium-sized farmers (2-5 ha) from 7 to 11 percent of the total. The government would help farmers by giving them the title deeds to the forest and g.m. land they cultivate. The government should make sincere efforts to ensure that only unproductive land, with the permission of gram sabhas and strict adherence to environmental regulations, is allotted to industries and mining.

Only 37 percent of farming households have access to some kind of irrigation. Three-quarters of these households have access to wells, mostly constructed with government funding, and 30 percent of these households have access to the water stored in talabs and bandhs. While well construction has been a success, the scheme targets individuals not communities, so households with larger landholdings, a proxy for wealth, are more likely to avail the scheme than those with smaller landholdings. Indeed, the study shows that over half of medium size farmers, but less than one-third of marginal farmers have access to irrigation water. Agricultural wells cannot irrigate large areas of farmland. The development of small-scale irrigation facilities therefore remains a pressing concern. Instead of centralised programmes that prescribe the irrigation structure to be built in a uniform manner, like the current dobha programme, funds could be provided directly to gram sabhas to allow village communities to themselves renovate old and develop new irrigation facilities. This would mark a break from the engineering paradigm that has hitherto marred irrigation development.

Very few farming households' access financial support from the government's various schemes. Two-thirds of farmers self finance, and 60 percent engage in exchange labour. Just 10 percent have taken loans from Self Help Groups, 8 percent from Kisan Credit Card (KCC), 12 percent from banks, and only two households have taken a loan from a government cooperative society. 19 percent take loans from their family, and 9 percent from money lenders. In total 44 percent of farmers said they'd taken a loan for farming, of a median average of 8,000 rupees. 61 percent of households sell some of their produce, earning a median average of 10,000 rupees per year. Only 21 percent of respondents said they knew the meaning of MSP – Minimum Support Price. The MSP for paddy is set at 16 rupees/kilo, but of 76 farmers who sold paddy in 2016, 93 percent sold it at between 10 and 12 rupees/kilo. 85 percent of respondents' crops have been damaged by the weather in the past, with an estimated median average loss of 16,000 rupees. Only 12 households were compensated by the government for their losses. 28 percent of the surveyed farmers said they had crop insurance; less than the 42.5 percent of farmers said by the government to have been covered by September 2016.

The agrarian crisis is essentially caused by the government's long-term neglect of agriculture. The private sector led petrochemical-based farming model that has filled the void left by government inaction has failed to increase the food security of farmers. This is evident from Jharkhand's 2017 ranking as first among India's states in terms of both proportion of underweight under-5s (48%) and prevalence of wasting (weight for height) in under-5s (29%). In particular, the unregulated misuse of pesticides poses a grave threat to the health of both farmers and consumers alike. There is an urgent need to support farmers to conserve in-situ whatever traditional seeds are still sown in the state. To complement development of agriculture, creation of meaningful off-farm employment opportunities, educational facilities and healthcare facilities in rural areas is required. This would reduce the number of out-migrants from Jharkhand, and the flow of population and resources from village to town. To this end, Jharkhand requires its own agricultural policy, designed with wide civil society consultation, to support farmers to shift towards a sustainable, productive and remunerative form of agriculture that can produce healthy food that suits the culture and traditions of the people, and agro-ecological conditions of the region.

Foreword - I

At a time when the dominant economic thinking is that farmers want to quit agriculture if given a choice, the results of a farmer survey conducted by the Bindrai Institute for Research, Study and Action (BIRSA) in Jharkhand, comes as a whiff of fresh air. If viewed in the right earnest; it carries the imprint of what can constitute a pro-people, pro-environment, and a pro-women development.

That 94 per cent farmers not only want to continue farming but also want their children to take up agriculture is a finding that runs counter to the dominant economic thinking, which is aimed at systematically pushing farmers out of agriculture. Ever since the World Bank in 1996 directed India to move out 400 million people from the rural to the urban areas in the next 20 years, the thrust of economic reforms has been in that direction. Over the years, agriculture has been deliberately kept impoverished so as to hasten the process of rural to urban migration. Moving people out of farming is seen as the big ticket reform that the country is waiting for, considered to be absolutely essential for achieving economic growth.

But the respondents in this study think otherwise. With agriculture becoming uneconomical, and with not much scope for non-farm employment back home, migration to distant urban centres becomes a necessity. A third of the households surveyed had a migrant worker, often trudging to faraway places in Maharashtra and Gujarat looking for a menial job. Given a choice, the respondents want to stay back and continue with farming. They know how distress migration is widening the social chasm. The challenge therefore is how to make farming economically viable, and compatible with the ecological needs. This requires a shift from the intensive farming practices, which have not only led to more pollution, contamination of the ground water and at the same time reversed the terms of trade. More money flows out of the village than the other way around.

Jharkhand offers a unique opportunity to create a development model based on its own peculiar agro-climatic conditions, geography and the abundance of biological resources. Blindly adopting intensive farming systems, in a bid to catch up with the Green Revolution bowl of Punjab, Haryana and now Madhya Pradesh, is not what Jharkhand needs. As the respondents have indicated, introduction of sustainable farming practices, encouraging traditional pulses and grains, integrated with forestry and animal husbandry, has the potential to re-create an economic development model which banks on the principle of Sabka Saath, Sabka Vikas.

Redrawing the agricultural map, based on the inherent strengths of three dominant agro-ecological zones that Jharkhand has, can regenerate agriculture. This is essential to achieve the twin objectives of household food security as well as nutritional security. Bringing back the cultivation of millets, which are increasingly being shunned in favour of hybrid rice, is therefore essential. It will require the pricing and procurement policy to be redesigned. Jharkhand needs to set up a network of APMC regulated market yards on priority, and provide an assured procurement for millets and traditional pulses so as to encourage its cultivation.

The realistic BIRSA study, based on a survey of 493 households spread over 11 districts, provides an insight into the reasons behind the continuing agrarian crisis. While the study at some stage needs to be further expanded, it has brought out the stark failure of governance for the margins. Lack of infrastructure facilities like micro-irrigation, marketing yards, availability of electricity, availability of cheap organised credit, village link roads, cold storages/godowns are some of the immediate reasons for the continuing crisis as listed by the respondents. This is indicative of the phased withdrawal of public sector investments from agriculture. Accompanied by cuts in social sector spending, the underlying intention of a population shift becomes obvious.

Business as usual is not the way forward. The BIRSA study has brought out the urgent need to take a relook at the agricultural policies, with the aim to make farming sustainable as well as economically viable. It's high time the policy makers, academicians, and the civil society strive to make suitable policy corrections to not only sustain, but also strengthen the rural livelihoods. Only a vibrant agriculture provides hope.

Devinder Sharma

Mohali, Punjab

Foreword - II

The publication of this research study on the burning problem of the agrarian crisis in Jharkhand is timely. Agriculture as practised today is not economically viable. The research compares the situation of ST, OBC and SC farmers. Actually, scheduled castes are landless on a large scale and own less agricultural land, which doesn't come out so well in this study. In the past 20 or so years a new type of farmer has emerged in Jharkhand, who have agricultural land but are not farmers, rather they are contractors, servicemen, advocates, doctors, and businessmen. They have given their land on batai to agricultural labourers. These rich farmer castes do not touch the plough because they consider it beyond their dignity and prestige. Though fully dependent on labourers, they engaged labourers on a lesser wage, and are nowadays weeping over the labour crisis. They have blamed this on the IAI card and subsidised ration system, which according to their understanding has made labourers lazy. The ration system is not however responsible for the labour crisis. Farmers' and farm labourers' children are not ready to work in the old model of farming system. They are instead going to towns and cities looking for alternative jobs.

Those farmers who are totally dependent on labour might be ready to leave farming, but for those who are labourers, there is no alternative and they are bound to work in agriculture. On the other hand, Adivasi farmers are not ready to leave farming because for them, agriculture is life and prestige. At any cost they consider it their primary duty to protect their land. As Deputy Speaker of the Lok Sabha, the Honourable Kariya Munda MP continued to plough his land and harvest a paddy crop, which is symbolic of the Adivasis love for their land. For this reason, most of the Adivasis had staunchly protested amendment to the CNT and SPT Acts. In Khunti Abraham Mundu was martyred. Earlier Adivasi and non-Adivasi farmers had protested a field firing range in Netarhat with the slogan "jan denge, jamin nahi" ("we'll give our lives, but not our land"). It is a said expression of the Adivasi cultural identity that they love their land so.

In Jharkhand's formative period, zamindar (landlord), mahajan and shudkor (money lenders) were the enemies of the farmers, snatching their land including GM land through AR (assessment of rent) cases. The farmers fought back. In 1966-67 there was a famine in Jharkhand which hit Palamau the hardest. The then deputy commissioner of Palamau Dr Kumar Suresh Singh had distributed to the farmers Takabi Reen (loan without interest) and advised them to dig wells. The farmers dug wells and with latha kudi and rahat they irrigated the land and harvested a bumper crop never seen before. It is said that the wheat crop on the snatched land then said to the farmers "this is your land". Hearing this, the farmers prepared to reclaim their land. The CPI and other communist organisations understood the farmers' anger and problems, and supported their struggle. The agrarian conflict in Palamau snatched the land back from the possession of landlords and mahajans. Thereafter the farmers' children, previously bound to eat makai ka ghatha, could eat roti and rice.

Today, it has become the primary task of farmers to protect their land from the government. When the amendments of CNT and SPT Acts were proposed there were big protests, and the honourable governor returned the proposal to the state government. The government then resorted to amend the Land Acquisition Act 2013, and through this they and the corporates hope to snatch farmers' lands. After protesting this matter, the Honourable Shri Pradip Yadav MLA and Shrimati Nirmala Devi MLA were thrown in jail. When farmers have requested real compensation for land acquired by companies, the management and government have not been ready to pay them. When farmers demanded compensation by IPL factory in Ramgarh, Dashrath Nayak and Ram Lal Mahto were killed in police firing. When farmers opposed acquisition of land in Hazaribagh district's Barka Gaon, the sons of four farmers were killed in police firing. In this way Jharkhand's agrarian crisis has increased.

The study mentions that vegetable growing farmers had thrown their tomato harvest on the road in protest

at the government's lack of support. The hybrid system of farming and its dependency on chemicals has challenged the economy of farmers and led to the sky rocketing of production costs. This hybrid system started in villages close to the cities and towns, but slowly entered the remote villages of the state. Production costs have increased yet procurement prices have not correspondingly improved. The bazaar samiti came into existence and there was a terminal system, but the terminal system failed to provide a market even for vegetable products. Farmers have become the slaves of middlemen. The Honourable Chief Minister of Jharkhand has said we should fight the middlemen. In Ranchi district, from Ratu to Kuru on both sides of the road, vegetable growers are residing, many of whom are Adivasi. But in the marketplace, a particular caste of people have acquired the market and become middlemen. It is the misfortune of farmers that attempts by the administrative officer Mr K.K. Sone to end the culture of middlemen but failed. The idea of mall and fresh came forward but this too failed. The banks are also not in favour of farmers. Without bribes or middlemen, even the KCC loan has not been given by the banks. Farmers have not been able to repay the loans on time, and banks have given notice for their land and property.

Land has not been irrigated but many farmers have been displaced by large dam projects in North Koel (Palamau) and Swarnrekha (Singhbhum). Palamau falls in a rain shadow area, and so most of the year it suffers from permanent drought. A dam and barrage were constructed in the 1980s on the North Koel. Though the dam is situated in the upper part of Palamau, the barrage is situated in the lower part of Palamau plateau on the border of Aurangabad district. Most of the water irrigates land in Bihar, and since formation of Jharkhand, the government is yet to discuss with the Bihar government about a share of water for Palamau. On the other hand, in Gumla, Dumka, Jamtara, Deogarh and Godda there are large areas of dangal (parati bhumi) that the government has not even tried to irrigate till today. For example, the water of Ajay barrage irrigates land under paddy but not barren land. This too puts pressure on farmers to leave their lands.

This research study is a mirror of agriculture in Jharkhand. It is not dependent on cut and paste. The researcher has tried to build his own dataset on all the aspects of agriculture. The author has noted that Birsa Agricultural University (BAU) has failed to undertake research on traditional agriculture and seeds, and has thereby supported the undermining of traditional, sustainable farming systems. Though BAU organises fairs, talks about testing soil, modernising agriculture, timely sowing of crops and application of fertilisers, it is not talking about the lack of profit in agriculture, or on the matter of dangerous, misuse of chemical pesticides. Shopkeepers have exploited the gentle farmers. For example, the pesticides approved for use on cotton crops are being sold to be used on vegetable crops. Diseases have increased, and farmers and consumers of crops and vegetables have become patients of incurable diseases. Farmers give their faith to the un-experienced shopkeepers and middlemen, and due to this are losing their skills. More support to farmers is needed to prevent deskilling. Farmers are being exploited by duplicate seeds, fertilisers and pesticides, and BAU is not taking action on this. The employees of BAU fear they will be punished by the government if they raise these issues. Once upon a time, the Japanese system of paddy cultivation by lines was promoted and production increased. Nowadays, sribidhi (S.R.I.) has emerged as a new technique giving impressive production increases. Yet the government's agricultural department has worked more on pen and paper than on the ground, and has not made efforts to popularise sribidhi.

The researcher has correctly shown that the millets gondli and maduwa are nowadays grown in a limited area. In Gumla, Simdega and Lohardaga districts maduwa production is still found on a large scale. The research work misses that gondli is grown in Latehar, particularly in the Mahuadanr area adjacent to Gumla and Chhattisgarh state. In spite of this, the research has built up a useful database on agriculture, including tilhan and dalhan. The study shows that production of rahar is higher in Dumka, yet actually the best production is in Palamau and Garhwa. In pulses, the author has focused attention on kurthi which is much appreciated. That different caste groups produce different crops is also well observed. For example,

in Palamau's Hariharganj block there is just one Adivasi village. Its farmers grow jowar (sorghum), yet in none of the surrounding villages is jowar grown. The number of farmers ready to leave agriculture has been discussed seriously. Without dependence on government data, the real picture of the farmer is presented. It is shown that even the 64 percent of farmers who fail to produce sufficient food for the year are not ready to leave farming. Of the total farmers interviewed, 94 percent farmers are not ready to leave, with just 6 percent of farmers saying that they would leave if alternative options are made available.

In the villages animal husbandry is an intrinsic part of the farming system. Some farmers are working with tractors and modernised techniques, yet in spite of this, cows, bullocks, buffaloes and goats are required. It is a little known fact that in the northern belt of Jharkhand, from Garhwa to Giridih, sheep were formally used as a most sought after source of natural fertiliser for farmland. Perhaps knowingly the researcher has not discussed animal husbandry at any length. Due to loss of forest cover, farmers are no longer ready to keep livestock. The forest used to be dense with a huge variety of trees and shrubs, which the livestock could graze upon freely. In those days, due to their diets, domesticated animals were extremely healthy. Due to deforestation this source of animal fodder has ceased and erosion of forest land started. The dense forest's litter, which through rainfall, river and streams reached the fields via run-off, acted as a fertiliser for farmland. This has reduced considerably. As fewer nutrients reach the farmland, so today's children have become malnourished by the poorer quality food reaching their plates. Lesser availability of nutritious products from the forest, like fruits, roots etc, also impacts upon the nutrition of today's children. The population of livestock decreased, and farmers came to depend on artificial fertilisers.

If this work would have included animal husbandry it could have been considered a unique book of the agrarian crisis in Jharkhand. For balanced agriculture, it is compulsory that every household keeps at least cows, buffaloes, goats, sheep, pigs or practises fisheries. Then only will farmers be able to fight the agrarian crisis. But this will be possible only when a farmers' government is formed. Thanks to the author and his assistants. This work is true and practical, not a table work but a report from the field. Jharkhand's farmers are laborious as other farmers in India, yet successive governments have hitherto treated farmers as second grade citizens. Only if farmers' experience and skills are properly utilised can the agrarian crisis in Jharkhand be addressed and overcome.

K. D. Singh

General Secretary, All India Kisan Sabha (AIKS), Jharkhand State

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Most of all, we thank the farmers who participated in the survey.

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1. Background to the study

Agrarian crisis in Jharkhand

Until recently, most of Jharkhand's farming households practiced subsistence agriculture, involving kharif crops of rice and millet, sometimes a rabi crop, and vegetables and maize grown on homestead land. The seeds of these crops, all well adapted to the local climate and conditions, were developed, managed and passed on by generations of farmers. Typically, all active members of a family were involved in farming, and only as much land as needed was cultivated. Households also greatly depended on collecting food and other products from the commons such as forests, fields, ponds and rivers. Community support mechanisms or practices were intrinsic to overall livelihood strategies, for example, the collective preparation of farmland prior to sowing. Bullocks and buffalo were kept for ploughing the land and a variety of livestock were reared for their manure and meat and for sale when cash was required. Ritualistic festivals tied to the agricultural cycle strengthened the community relationships that sustained these farming systems. The major festivals of Chotanagpur include baha or sarhul (the spring festival), karam (the festival of cultivation), and sohrai (the cattle festival).¹ In Santhal Parganas, the Santhals celebrate sohrae, baha, erok sim (sowing of paddy), hariar sim (the growth of paddy), and janthar and magh sim, connected with offerings of the first fruits of crops like millets and lowland paddy.² Research shows that the traditional agricultural practices were based on a wealth of knowledge regarding conservation of soil fertility, natural pest control, water resource management, and agro-forestry. This allowed small farming families to meet their subsistence needs with little dependence on external agricultural technologies and inputs.³ The diets, consisting of a mix of farmed and collected items, were not only more sustainably produced, but also richer in nutrients than modern, standard Indian diets and had positive medicinal effects.⁴ Yet all of this is under threat.

Jharkhand's agricultural systems have in recent decades undergone a rapid process of transition. Many of the agricultural practices of the past, which emerged under specific local and climatic conditions, are being replaced by innovations developed elsewhere. Due to unfavourable conditions, Jharkhand and much of Eastern India were bypassed during India's Green Revolution of the 1960s, 1970s and 1980s.⁵ Since around the 1990s, however, F₁ hybrid seeds and chemical inputs began to reach Jharkhand's villages, small amounts distributed by government block offices, but mainly supplied by the private sector. Nowadays farmers across the state are growing F₁ hybrid varieties of the staple crop paddy and other crops like maize and wheat, pulses and oilseeds, and vegetables. Unlike traditional varieties, these hybrids require chemical inputs and more water. An assortment of chemical fertilisers, herbicides, insecticides and fungicides are purchased by farmers for the production of hybrid crops. Most of the information farmers receive regarding seeds, fertilisers and chemical pesticides comes directly from poorly-informed retailers, who in turn receive information from their suppliers who have a vested interest to promote their products.

¹ Munda, R. D. (2014). *Adi-dharam. Religious beliefs of the Adivasis of India*. Kolkata: Adivaani.

² Troisi, J. (1979). *Tribal religion. Religious beliefs and practices among the Santhals*. New Delhi: Manohar.

³ Dey, P., & Sarkar, A. K. (2010). Revisiting indigenous farming knowledge of Jharkhand (India) for conservation of natural resources and combating climate change. *Indian Journal of Traditional Knowledge*, 10(1), 71-79. See also Denevan, W. M. (1995). Prehistoric agricultural methods as models for sustainability. *Advanced Plant Pathology* (11), 21-43.

⁴ Ghosh-Jerath, S., Singh, A., Kamboj, P., Goldberg, G., & Magsumbol, M. S. (2015). Traditional knowledge and nutritive value of indigenous foods in the Oraon tribal community of Jharkhand: An exploratory, cross-sectional Study. *Ecology of Food and Nutrition*, 54(5), 493-519.

⁵ Singh, R. P., Kumar, A., & Pal, S. (2016). The prevalence, productivity, and protection of the traditional varieties vis-à-vis modern varieties in Eastern India: An appraisal. *Jharkhand Journal of Development and Management Studies*, 14(2), 6955-6970. See also Hill, J. K. W. (2015). F₁ hybrid rice in Eastern India: Silver bullet or capitalist ploy? *Capitalism Nature Socialism*, 26(3), 73-88.

Photo 1.1: A retailer's store in Ranchi district, selling F_1 hybrid and HYV seeds, and other inputs



Compared with traditional varieties, most F_1 hybrid varieties yield higher quantities if grown under the right conditions, but are less nutritious and more likely to perform badly or fail completely under difficult conditions, e.g. uncertain irrigation. F_1 hybrid rice varieties require chemical inputs, which contaminate and deplete the fragile soil cover, and damage the micro-ecology of paddy fields, killing off the small fish traditionally caught as food during the monsoon months.⁶ The distribution of hybrid seeds of paddy and other crops by the government and private sector have led to a reduction in the cultivation and consumption of traditionally grown and more undemanding crops like maduwa (finger millet) and gondli (foxtail millet), rahar (pigeon pea) and kurthi (horse gram). These traditional varieties, in addition to requiring less water and no chemical inputs, also fix or keep nitrogen in the soil, thus sustaining soil quality and fertility. The promotion of hybrid seed has thus led to a great decline in traditional varieties (landraces) of all crop types. Landraces are easily rendered extinct as they are typically grown in a restricted area by a few communities only.

A broad diversity of crop types and varieties is recognised to be the best protection against food insecurity related to an increasingly unpredictable and changing climate. The Government of Jharkhand's 2014 report, Jharkhand - Action Plan on Climate Change, argues that traditional local knowledge such as use of local crop varieties and inter-cropping need to be mainstreamed.⁷ Yet farmers are being encouraged by the private and government sector alike to purchase and plant hybrid seeds, such that local seed varieties have disappeared across vast tracts of the state. Some work has taken place to preserve seed, such as the setting up and managing of seed banks by NGOs in rural areas. The Krishi Vigyan Kendras (KVKs) of Jharkhand

⁶ Kumar, S. & Singh, S. K. (2016). Effects of hybridisation on secondary characteristics of rice plants. Jharkhand Journal of Development and Management Studies, 14(2), 7009-7021. <http://xiss.ac.in/jjdm/s/Vol14/Issue2/>

⁷ Government of Jharkhand (2014).

– e.g. Ramakrishna Mission in Ranchi district – have more recently “identified and registered more than 1800 farmers’ varieties” for plant variety protection with the Protection of Plant Variety and Farmers’ Right Authority of India (PPV&FRA).⁸ Seed banks and registration alone, however, will not solve the problem of loss of biodiversity.

A complete shift to hybrid varieties means that the farmers lose control over their seed, and have to purchase hybrid seeds and required fertilisers and pesticides each year. To generate the cash income necessary for input intensive farming, but also because of a lack of development of off-farm employment opportunities, family members migrate to work as labour. Children are sent away to towns and cities for their education. This in turn means that the workforce for farming in the village shrinks, and community support mechanisms become more difficult to uphold. In the ideological domain, mainstream culture promotes an image of both village life and farming as ‘backward’ in contrast to ‘modern’ city life. Not only does this neglect the importance of the farming sector for the country as a whole, but it ignores and demeans the knowledge and skills of farmers making this occupation seem unattractive, especially to youth. 2017 has seen farmer protests across the country which have helped to bring the woes of farmers to the forefront of public attention; however the history of neglect towards farmers by successive governments is deeply entrenched.

Despite the so-called modernisation of agriculture in India, the situation of most of its farmers is extremely difficult and Jharkhand is no exception. In India in 2011 there were almost 15 million less farmers or ‘main cultivators’ as compared to 1991, which means that on average more than 2,000 farmers lost or left their farmland every single day over the 20-year period.⁹ According to a 2014 survey conducted in 18 Indian states including Jharkhand, almost three-quarters of farmers said that they were generally happy with farming as an occupation. Yet given the adverse conditions, about two-thirds of farmers said they’d quit farming if they had an alternative, and less than one-fifth wanted their children to continue farming.¹⁰ Almost a half (47 percent) of farmers rated the overall conditions for farmers in India as ‘bad’; and in Jharkhand this figure rises to 60 percent of farmers.¹¹ Perhaps this explains why in the recent Economic Survey, Jharkhand was shown to have the highest net outflow of working age population of all Indian states: more than 5 percent migrate annually in search of better employment, education or due to loss of livelihood.¹² Farmers and farm workers are also said to be the group most adversely affected by the recent demonetisation measures.¹³

Though fewer in number compared to other states, in 2017 a number of incidents of farmer suicide in Jharkhand were reported in the press. In June 2017 a 44-year old farmer Kaleshwar Mahto committed suicide due to the stress of being unable to repay a 2011-12 loan for 40,000 rupees taken in his wife’s name with a Kisan Credit Card (KCC); the loan’s value had risen to 61,000 rupees by the time of his death.¹⁴ Three days later Baldeo Mahto, also from Pithoria block in Ranchi, who had a bank loan and a 25,000 rupees loan from KCC, killed himself.¹⁵ Another farmer, 40-year old Domna Oraon of Lohardaga district, killed himself

⁸ Singh, Kumar, & Pal (2016).

⁹ Sainath, P. (2013, May 2). Over 2,000 fewer farmers every day. The Hindu. <http://www.thehindu.com/opinion/columns/sainath/over-2000-fewer-farmers-every-day/article4674190.ece>

¹⁰ CSDS (2014). State of Indian farmers: A report. http://www.lokniti.org/pdf/Farmers_Report_Final.pdf

¹¹ CSDS (2014). p. 21

¹² Migration from Jharkhand highest in country: Economic survey. (2017, February 10). Times of India. <http://timesofindia.indiatimes.com/city/ranchi/migration-from-state-highest-in-country-economic-survey/articleshow/57070016.cms>

¹³ Vissa, K. (2017, February 3). Why the budget is deceptively ‘pro-farmer’. The Wire. <https://thewire.in/105575/why-the-budget-is-deceptively-pro-farmer/>

¹⁴ At an annual interest rate of 7 percent, a 40,000 rupees loan rises in value to 60,000 rupees in six years. Dey, S. (2017, June 15). Unable to repay Rs 61,000 loan, farmer commits suicide in Jharkhand. Hindustan Times. <http://www.hindustantimes.com/ranchi/unable-to-repay-rs-61-000-loan-farmer-commits-suicide-in-jharkhand/story-6HtPU5N8yyckhD6mp5mtyH.html>

¹⁵ Another farmer suicide in Jharkhand, officials deny loan pressure. (2017, June 16). The Times of India. <http://timesofindia.indiatimes.com/city/ranchi/another-farmer-suicide-in-jharkhand-officials-deny-loan-pressure/articleshow/59172161.cms>

at the end of June due to his inability to repay a loan of 45,000 rupees taken on KCC in 2016. In early July, Rajdip Nayak from Ormanjhi killed himself by consuming pesticides, allegedly due to harassment by bank officials for repayment of loans.¹⁶ In mid-July Sanjay Munda killed himself; his family said “he was unable to procure money for paddy cultivation and had also incurred losses in his previous crops”.¹⁷ More information is required to understand why these farmers took such drastic steps. The psychological impact of a quick shift from subsistence to market based agriculture, with added financial pressure, is no doubt an important factor. Regardless, these suicides indicate that Jharkhand’s farmers are experiencing a crisis.

Conditions for agriculture in Jharkhand

The state of Jharkhand was created in 2000 with the bifurcation of Bihar, the culmination of a historical struggle related to “aspirations for control over natural resources and the recognition of an adivasi and regional identity and traditions”.¹⁸ What was finally achieved, however, was much less in both spatial and ideological senses than what had originally been demanded.¹⁹ Formation of Greater Jharkhand, which was to have included several of the culturally-contiguous districts of West Bengal, Odisha and Chhattisgarh, could have forced rural issues to the forefront of public debate and government policy, and brought the share of tribals to about a half of the total population. With its current boundaries however, the 32 Scheduled Tribes in the state, which include the Munda, Santhal, Oraon, Kharia, Kharwar, Ho and Bhumij, comprise a minority of just 26.2 percent of the total population (2011 Census). Perhaps due to this, the policies framed since Jharkhand’s independence have not been tailored to cater for the rural peoples’ needs and aspirations, or to deal with their long standing problems.

Jharkhand, which geographically is almost synonymous with the Chotanagpur plateau, comprises three agro-climatic sub-zones, namely the central and north-eastern sub-zone IV (from Chatra and a part of Ranchi to the Santhal Parganas), the western sub-zone V (from Simdega to Garhwa and a part of Ranchi), and the south eastern sub-zone VI (undivided Singhbhum). Between 18 to 22 lakh hectares of Jharkhand’s 38 lakh hectares of cultivable land is under cultivation. The Agricultural Census 2010-11 shows that 68.2 percent of Jharkhand’s farmers have less than 1 ha of farmland (marginal farmers), while another 15.8 percent have between 1 and 2 ha (classified as small farmers). Together this 84 per cent of farmers cultivate just 42.2 percent of all farmland operated.²⁰ Across all the three sub-zones the soil is characterized by low water-holding capacity. Moderate to severe soil erosion is affecting up to 40 percent of the total area due to the hilly terrain and rampant deforestation, and problems with soil acidity occur in about 4 lakh hectares of the cultivated area.²¹ Further, though 29 percent of Jharkhand’s land is officially covered by forests,²² much of this is severely degraded.

Rains are unevenly distributed, with 70 to 80 percent of rainfall in the kharif season (June to October). There has been an historic dearth of effective measures to stop and conserve run-off water, and most of the pre-existing water storage facilities in villages are dilapidated and dry up by February/March. Therefore, whereas in many Indian states two or even three crops can be grown each year, much of Jharkhand’s farmland is under

¹⁶ Another farmer commits suicide in Jharkhand due to financial stress; fifth death in just over a month. (2017, July 19). The Indian Express. <http://www.newindianexpress.com/nation/2017/jul/19/another-farmer-commits-suicide-in-jharkhand-due-to-financial-stress-fifth-death-in-just-over-a-month-1630837.html>

¹⁷ ₹ 2 lakh aid for family of farmer who killed self (2017, July 21). Times of India.

¹⁸ Sundar, N. (2009). Laws, policies, and practices in Jharkhand. In N. Sundar (Ed.). Legal grounds: Natural resources, identity, and the law in Jharkhand (pp. 1-29). New Delhi: Oxford University Press. p. 20

¹⁹ Sundar (2009).

²⁰ Government of India (2014). Agricultural census 2010-11. All India report on number and area of operational holdings. Agricultural Census Division, Department of Agriculture and Co-operation. Retrieved from <http://agcensus.nic.in/document/agcensus2010/completereport.pdf>

²¹ SAMETI (2016) Status of agriculture in Jharkhand state. http://www.sameti.org/default1_1sprof.htm

²² Government of India (no date). Jharkhand: The 28th state of the Indian union. <http://pib.nic.in/feature/feyr2001/fjun2001/f180620011.html>; see also Government of Jharkhand (2002). Vision 2010. Government of Jharkhand.

mono-crop cultivation due to a lack of irrigation and effective water resource management. No reliable data exists, however, it is estimated that between 8 to 11 percent of this land is irrigated.²³ These figures neglect to account for the recent phenomenon of small-scale irrigation from wells, ponds and dobhas using pumpsets, and for earlier work by NGOs like PRADAN and SPWD who popularised the five percent model and Jaldhar 30 * 40 technique (in which a portion of a farm plot is turned into a water collection pit) in some areas.²⁴ Climate change, which causes abnormal and erratic rainfall, is already severely affecting Jharkhand's farmers' harvests. An increase in temperature is forecast to reduce the yields of crops.²⁵

Are government initiatives addressing the problems of farmers?

A number of (mostly central) government initiatives are being implemented in a bid to improve agriculture and the conditions of farmers. Attempts have been made to support the procurement of farmer produce – and to eliminate traders' and middlemen's exploitative monopoly over this sector. For example, the government set the Minimum Support Price (MSP) for paddy at 1470-1510 rupees per quintal in early December 2016, with a bonus of 130 rupees/quintal to be added.²⁶ Yet in January and February 2017, farmers were reportedly selling their paddy for as little as 8 rupees per kg in many parts of the state. By June 2017, after the death of five protesting farmers in Madhya Pradesh, farmer unions across the country demanded that MSP be raised by 50 percent as recommended by the Swaminathan Commission. Yet some experts have questioned whether MSP alone can provide farmers with a sufficient income, because it has not kept up with the rise in farm costs, and only 6 percent of Indian farmers avail it.²⁷ Food policy expert Devinder Sharma has asked how the remaining 94 percent of farmers will benefit if MSP is raised by 50 percent. Instead, he suggests payment of extra allowances to farmers, an assured monthly income package to farming households, and creation of thousands of mandis (markets) for mandatory procurement of farmer produce.²⁸

The procurement of farmer produce requires the setting up of effective storage facilities and processing units for highly perishable vegetables like tomatoes, which are subject to extreme price volatility. At the end of January 2017, 100 or so farmers from Bundu, Ranchi district, dumped tonnes of tomatoes on the National Highway in protest against the low rates their produce was fetching (1-2 rupees/kg).²⁹ By early July the price of tomatoes was 60 rupees per kilo, and still rising. This cycle repeats itself year after year. The government is reportedly building 14 cold storage units and 850 godowns across the state,³⁰ but one is left to wonder if they will be managed competently. In July 2017 more than 1,000 quintals of rice and wheat were found spoiled in the grain godown in Ranchi, due to mismanagement by Jharkhand State Food and Civil Supplies Corporation Limited (JSFCSL).³¹ Yet another godown collapsed due to heavy rainfall in late July 2017. Newspaper reports of a Mega Food Park at Getasud do little to alleviate the pain felt by farmers and consumers alike. Seven years after its foundation stone was laid in 2009, in February 2016 it was inaugurated even though its cold storage units were still incomplete and just one of 31 units had performed bhoomi

²³ Government of India (no date).; SAMETI (2016) Status of agriculture in Jharkhand state. http://www.sameti.org/default1_1sprof.htm

²⁴ Karmakar, J. (2001). Jaldhar model: Capturing the raindrop. In A. Agarwal, S. Narain, & I. Khurana (Eds.). *Making water everybody's business* (pp. 118-121). New Delhi: Centre for Science and Environment.

²⁵ And will affect milk and egg production too. Government of Jharkhand (2014). *Jharkhand – Action plan on climate change*. <http://www.moef.nic.in/sites/default/files/sapcc/Jharkhand.pdf>

²⁶ SMS to farmers for sale of paddy (2016, December 2). *The Telegraph*. Retrieved from https://www.telegraphindia.com/1161202/jsp/jharkhand/story_122417.jsp#WJizT6LhXIU

²⁷ Devi, P.I., Kumar, L., Kumar, D. S., Mukhopadhyay, P., Raghu, P., Sharma, D., Sridhar, R., & Venkatachalam, L. (2017, April 29). Payment for ecosystem services. *Guaranteed farm income and sustainable agriculture*. *Economic and Political Weekly*, LII(17), 12-14.

²⁸ Sharma, D. (2017, June 29). Were the farmers' protests only for the sake of 6% farmers? <http://devinder-sharma.blogspot.in/2017/06/were-farmers-protest-only-for-sake-of-6.html>

²⁹ Red ruin on NH-33. (2017, January 31). *The Telegraph*. https://www.telegraphindia.com/1170131/jsp/frontpage/story_133207.jsp

³⁰ State expects a good harvest. (2017, July 27). *The Telegraph*. https://www.telegraphindia.com/1170727/jsp/jharkhand/story_164027.jsp

³¹ Saryu seeks godown food wastage report. 1,000 quintal of grain left to rot for 6 years. (2017, July 23). *Sunday Times of India*. Ranchi.

pujan (a Vedic sutra) on the land.³² In May 2017 it was reported that the 114 crore rupees food park – which has received a 50 crore rupees subsidy from the Central Government – is locked in red tape and investors are pulling out.³³

The other demand of farmer unions is to waive outstanding farm loans, as recently pledged to UP farmers by the state's newly elected Chief Minister. Due to its coal reserves Jharkhand became a revenue surplus state in 2016, so the government could easily follow suit.³⁴ Yet would the waiving of loans free farmers from debt? Statistics at the India level show that 82 percent of indebted households are marginal and small farmers (having less than 2 hectares), and that this same group of farmers have smaller loans and are more likely than medium and large farmers to have other debts from non-institutional sources, like moneylenders. Half of what is extended as agri-credit is actually being given to non-farmer corporate borrowers. So a waiving of loans, it is argued, would benefit larger farmers and business more than smaller farmers; and would not stop smaller farmers from immediately falling back into debt.³⁵ One alternative option, therefore, would be to waive only the loans taken by marginal and small farmers. Another idea is that farmers can form 'joint liability groups' when taking loans, such that the pressure to repay when things go wrong does not fall on one person alone. Crop loans given via the government's Kisan Credit Card scheme, it can be noted, have a 7 percent interest rate, which means a 40,000 rupees loan will become 60,000 rupees if not repaid in six years. Notably, in September 2017, the Special Secretary (agriculture) Puja Singhal announced that the rate of interest on KCC loans is to be reduced from 7 to 1 percent.³⁶

The Pradhan Mantri Fasal Bima Yojana (PMFBY) has replaced earlier crop insurance schemes from kharif 2016 onwards.³⁷ By late July 2017, 12.5 lakh of a targeted 20 lakh of Jharkhand's farmers are said to be covered by the scheme³⁸ as compared to 8.5 lakh farmers in September 2016.³⁹ Farmers applying for a loan through their Kisan Credit Card (KCC) have to pay a premium for crop insurance. Yet smaller farmers are unsure if they will benefit from the insurance because of the time and resources involved in making a claim. Recent reports from the Comptroller and Auditor General (CAG) and the Centre for Science and Environment (CSE) show that government-pushed insurance schemes benefit insurance companies more than they do farmers: the CSE report, which analyses the new PMFBY, shows that insurance companies benefited by a cumulative 10,000 crore rupees as of April 2017, due to low claims in relation to the premium charged. The reasons cited for low claim settlements include delays in states releasing their share of the subsidy, but also much lower threshold yields being fixed by state governments for determination of claims, and discrepancies in crop cutting exercises (CCEs) which establish entitlement to a payout.⁴⁰ Gopal Naik, board member of the Agriculture Insurance Company (AIC), said that six months after the end of the 2016 kharif season, the claims settled were less than a quarter of the total claims made. K. Krishnaprasad of the All India Kisan Sabha said "Instead of transferring thousands of crores to insurance companies...why can't the govt...compensate farmers".⁴¹

³² Finally, state serves up its food park (2016, February 16). The Telegraph. https://www.telegraphindia.com/1160216/jsp/jharkhand/story_69470.jsp

³³ Mukesh, A.S.R.P. (2017, May 31). Mega food park locked in red tape – Investors mull pullout as infrastructure issues plague Rs 114cr project. The Telegraph. https://www.telegraphindia.com/1170531/jsp/frontpage/story_154348.jsp

³⁴ Deogharia, J. (2016, November 25). With coal royalty, Jharkhand now a revenue surplus state. The Times of India. <http://timesofindia.indiatimes.com/city/ranchi/With-coal-royalty-Jharkhand-now-a-revenue-surplus-state/articleshow/55607120.cms>

³⁵ Kuruganti, K. (2017, July 23). Why India must go beyond waivers to free farmers from debt. The Wire. <https://thewire.in/160231/loan-waiver-farm-debt/>

³⁶ We're trying best to help farmers: Min. (2017, September 14). The Times of India, Ranchi.

³⁷ Vasudeva, V. (2016, January 14). Centre clears new crop insurance scheme. The Hindu. <http://www.thehindu.com/todays-paper/tp-national/Centre-clears-new-crop-insurance-scheme/article13999101.ece>

³⁸ State expects a good harvest. (2017).

³⁹ 'Crop insurance scheme a quantum jump for state' (2016, September 28). The Times of India, Ranchi.

⁴⁰ Mukherjee, S. (2017, July 25). 'Government's crop insurance schemes failed farmers, helped insurance companies'. The Wire. <https://thewire.in/161474/modi-government-crop-insurance-schemes/>

⁴¹ Varma, S. (2017, July 8). Who's benefiting from crop insurance: SC to government. The Times of India. <http://timesofindia.indiatimes.com/india/whos-benefiting-from-crop-insurance/articleshow/59498164.cms>

The Department of Agriculture and Cooperation, under the Ministry of Agriculture, stresses technology and industrial farming approaches, such as the 'Bringing Green Revolution to Eastern India' sub-scheme of Rashtriya Krishi Vikas Yojana (RKVY), which promotes use of hybrid seeds and chemical inputs. The National Mission for Sustainable Agriculture (NMSA), which aims to promote soil health by use of balanced amounts of chemical fertilisers, has rolled out a scheme to provide all farmers with Soil Health Cards. By the end of July 2017, Jharkhand's Agriculture Minister Randhir Kumar Singh said that 7 lakh of 20 lakh farmers have been provided their cards, and the remaining will receive their cards this fiscal year itself.⁴² With these cards, farmers are entitled to receive up to 2500 rupees/ha worth of micronutrients and soil ameliorants.⁴³ In August 2017, Dr Mangla Rai, former director-general of the Indian Council of Agricultural Research and ex-secretary of the Department of Agriculture Research and Extension, stated that "The government has launched an initiative to give soil health cards to all farmers, but this would hardly help until we tell farmers how to improve their soil. It is like a patient goes to a doctor, he diagnoses the problem but does not prescribe any treatment. The same is happening with the present soil health card drive."⁴⁴

Government agencies, be they departments or agricultural universities, are increasingly partnering with multinational corporations and facilitating market penetration of the remotest of villages in a quest for higher yields (and profits). Jharkhand's state agricultural university, Birsa Agricultural University, overwhelmingly promotes chemical intensive agriculture. In a recent interview, Subhash Palekar, the proponent of Zero Budget Natural Farming (ZBNF) said "The Green Revolution has created many problems but agricultural universities don't have any solutions ... For thousands of years, our land had fertility, maintained by traditional farming. During the Green Revolution, the yield was increasing with the support of this very fertility. When the fertility was finished, the yield started to decline. That is what is happening now."⁴⁵ In interview, Dr Rai admitted, "Unfortunately, we have almost forgotten about adding organic manure to the soil or adding farm residue or recycling agricultural waste into the soil. Rather, we are burning agricultural waste, killing biological assets in the fields. The government is promoting biological manure and plant nutrients, but unfortunately, most of them are spurious, outdated, adulterated or not available in the market."⁴⁶

A recent seminar by the Indian Institute of Advanced Study, Shimla critiqued the promotion of uniform and centralised programmes that overlooks regional specificities. Instead it highlighted the loss of biodiversity, depletion of natural resources, looming impact of climate change and the increasing power of markets/corporations as challenges facing small and marginal farmers.⁴⁷ In these regards, several of the government's agricultural schemes are more supportive. A sub-scheme of the National Mission for Sustainable Agriculture (NMSA) promotes organic farming and certification through Participatory Guarantee Scheme (PGS). PGS India, as of 29 July 2017, has 178 registered groups in Jharkhand, with a total membership of 8816 farmers covering an area of 3554 ha.⁴⁸ 174 of these groups are formed by Biocert International, Indore,⁴⁹ and by Eko Guarantee, about which no information is available.⁵⁰ In 2012 an Organic Farming Authority of Jharkhand

⁴² State expects a good harvest. (2017).

⁴³ Government of India. (2017). A farmer friendly handbook for schemes and programmes 2017-18. Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare. [http://farmer.gov.in/imagdefault/handbooks/Farmer_Friendly_Handbook_2016_\(196%20Pages\)_11-03-17.pdf](http://farmer.gov.in/imagdefault/handbooks/Farmer_Friendly_Handbook_2016_(196%20Pages)_11-03-17.pdf)

⁴⁴ Dogra, B. (2017, September 9). The lack of consensus on farm and food policy is growing. The Wire. <https://thewire.in/175801/lack-of-consensus-farm-and-food-policy-growing/>

⁴⁵ Roshan, M. (2017, July 22). Interview: Subhash Palekar and the holy cows of natural farming. The Wire. <https://thewire.in/160165/subhash-palekar-natural-farming-gau-raksha/>

⁴⁶ Dogra (2017).

⁴⁷ Revitalising the rural: Rethinking rural and agricultural policies. A National Seminar held at the Indian Institute of Advanced Study, Shimla, 27-27 September 2016. <http://iias.ac.in/event/revitalising-rural-rethinking-rural-and-agricultural-policies>

⁴⁸ <http://pgsindia-ncof.gov.in/LGList.aspx>

⁴⁹ <http://www.biocertinternational.com/index.php>

⁵⁰ Eko Guarantee is said to be a division of Encon; about which no information is obtainable on the web.

(OFAJ) was set up to promote organic adoption and certification in the state,⁵¹ and seeks to export organic goods to Nepal and Bangladesh.⁵² This nascent organic sector needs much more attention; after all, why should a demand and market for organic produce not be developed in Jharkhand itself?

The Ministry of Rural Development oversees the National Rural Livelihood Mission (NRLM), with its focus on stabilising and promoting livelihoods by means of encouraging delivery of entitlements like MGNREGA and PDS through Self Help Groups (SHGs) and their federations. In Jharkhand, the NRLM is implemented by the Jharkhand State Livelihood Promotion Society (JSLPS), established by the Rural Development Department. One sub-component is the Mahila Kisan Sashaktikaran Pariyojana (MKSP), implemented through NGO partners. One objective is creation of sustainable agricultural livelihood opportunities; and to this end, NGOs are working to train farmers to farm sustainably. In a context of unregulated and dangerous chemical pesticide usage, MKSP is providing support that farmers need. Yet overall, only about 1 percent of the total budget to the agriculture sector was allocated to organic farming in 2016; and that too with an emphasis on value addition for domestic and export markets.⁵³ The government's provision of subsidies and incentives for chemical farming has tilted the balance away from organic farming.⁵⁴

The overwhelming need of farmers is small-scale irrigation facilities. Investments in small check dams, water recharge ponds and farmers' involvement in the development of irrigation infrastructure appropriate to the topography of particular villages, is the need of the hour.⁵⁵ Yet research shows that communities have themselves been unable to develop appropriate irrigation systems due to land ownership rights: the British-era settlements and post-independence land reforms took control of land resources out of the hands of most village communities.⁵⁶ For example, the government owns 44 percent of land in Santhal Parganas and 40 percent in undivided Singhbhum.⁵⁷ Furthermore, the government is not recognising the rights provided to gram sabhas in the Panchayats (Extension to Scheduled Areas) Act 1996 (PESA). Instead a sense of dependency – which folk rice specialist Debal Deb calls developmentalism⁵⁸ – has been fostered in the minds of the people, leading them to await government funds to develop their resources rather than to do so by their own initiative and resources. These and others factors have resulted in the poor management of pre-existing small-scale irrigation facilities such as talabs and bandhs which were designed to provide supplemental irrigation to cereals.⁵⁹

Only in the last decade or so has progress been made in the development of small-scale irrigation facilities. NGOs such as PRADAN have contributed greatly in this endeavour. Yet many schemes largely failed. For example the 'one lakh ponds scheme' of 2004, which aimed to dig one hundred thousand ponds, each costing

⁵¹ Agri, food and processing in Jharkhand (2017). Government of Jharkhand. <http://momentumjharkhand.com/wp-content/uploads/2016/09/Agri-Food-and-Feed-Processings-Sector-Profile-Jharkhand.pdf>

⁵² Ganguly, A. (2016, February 6). Seminar harvests ideas for agri exports. The Telegraph. https://www.telegraphindia.com/1160206/jsp/jharkhand/story_67684.jsp

⁵³ Bera, S. (2016, February 29). Budget 2016: Govt raises agriculture spending to Rs36,000 crore. Live Mint. <http://www.livemint.com/Politics/T3pDBIVQPF6Ri6MnyEEeBK/Union-Budget-201617-Govt-gives-Rs36000-cr-to-farm-sector.html>

⁵⁴ GOI Monitor (2012, June 21). 'Going local is the best solution to food insecurity'. GOI Monitor. <https://www.goimonitor.com/story/going-local-best-solution-food-insecurity>

⁵⁵ SANDRP (2016, October 24). Big dams ineffective, will help villagers build small check dams: CM Jharkhand. DRP News Bulletin. <https://sandrp.wordpress.com/2016/10/24/drp-news-bulletin-24-oct-2016-big-dams-ineffective-will-help-villagers-build-small-check-dams-cm-jharkhand/>

⁵⁶ Aareparampil, M. (2002). Struggle for swaraj. A history of Adivasi movements in Jharkhand (from the earliest times to the present day). Chaibasa: Tribal Research and Training Centre (TRTC); Ekka, A. (2011). A status of adivasis/indigenous peoples land series – 4: Jharkhand. New Delhi: Aakar Books and The Other Media.

⁵⁷ Sundar, N. (2009). p.26.

⁵⁸ Deb, D. (2009). Beyond developmentalism. Constructing inclusive freedom and sustainability. New Delhi: Daanish Books.

⁵⁹ Hill, J. (2014). Agriculture, irrigation and ecology in Adivasi villages in Jharkhand: Why control and ownership over natural resources matter. Journal of Adivasi and Indigenous Studies, 1(1), 43-61.

70,000 rupees, across Jharkhand, was inaugurated in October 2004, with the objective to provide instant employment to poor people in drought-hit areas and to create irrigational facilities for the agriculture sector. District officials however, found difficulties in land procurement. The scheme should have been completed by mid January 2005, however a newspaper report – which describes the scheme as “the most controversial scheme of the year 2004” – noted that by 22nd March 2005 not a single district had dug even ten ponds.⁶⁰

Since 2006 many agricultural wells have been built under MGNREGA. The purchase of small pumpsets has allowed farmers to use wells and ponds to irrigate some of their crops; using diesel and kerosene, and electric power where connectivity is provided. More recently dobhas (small storage works) have been extensively promoted by the state government. However the dobha programme, similar to the earlier one lakh pond project, is weak due to its supply driven and top-down approach. Block Development Officers have been seen pleading with farmers to sign up to have a dobha built on their land, even offering villagers a well for every three dobhas constructed,⁶¹ which needless to say leads to structures being built in inappropriate places. The economist Jean Dreze has criticised the Jharkhand government’s decision to allow machines to be used to dig 1.3 lakh dobhas.⁶² In some cases the government has failed to pay to farmers the second instalment. A 2016 survey in four districts of Jharkhand found that only 50 percent of workers engaged in dobha construction had been paid; and that just 40 percent of the work was complete even though the government claimed 80 percent was complete.⁶³

Experiences with medium and large irrigation projects in Jharkhand have been miserable. According to the economist Ramesh Sharan, in 1957 257,000 ha of Jharkhand’s farmland was irrigated, but by the year 2000, after 75 percent of the major irrigation projects in post-independent Bihar were undertaken in the Jharkhand region, the official figures for the total irrigated area had come down to 209,000 ha. Dams in the Jharkhand region have always been built for the benefit of cities and industry rather than farmers. Just three months after Jharkhand state’s formation, on 2nd February 2001, eight members of a campaign formed to keep contractors away from the site of a proposed dam on the Koel-Karo river system were shot dead by police at Tapkara village.⁶⁴ In the Bihar period, blood was also shed by villagers protesting the construction of the Icha and Chandil dams under the Subernareka Multipurpose Project. Another example is the Panki barrage, a now 34-year old project which hasn’t delivered a drop of its promised irrigation water to an estimated 25,000 ha of land.⁶⁵ Thus construction of big dams has proven to be ineffective, expensive and destructive, causing large-scale displacement and destruction of ecosystems, while not delivering any benefits to farmers.⁶⁶ Smaller-scale government projects, such as lift irrigation, have also met with failure. According to the social activist and documentary film-maker Meghnath, a 1987 study of 118 (BHALCO) lift irrigation projects in undivided Palamau district found only two to be actually functioning.

Experts have long argued that off-farm employment needs to be generated in rural areas to support farming communities and curb out-migration.⁶⁷ MGNREGA was designed for this purpose, yet many cases have been

⁶⁰ Kumar, M. (2005, 22 March). Govt not to forego pond scheme. The Telegraph. Jamshedpur.

⁶¹ Observed in Balumath block, Latehar

⁶² Machine-dug ponds blow for rural jobs. (2016, April 24). The Telegraph. https://www.telegraphindia.com/1160424/jsp/jharkhand/story_81842.jsp

⁶³ Claims of Jharkhand’s success in NREGS implementation are far from reality (2016, August 25). The Wire. <https://thewire.in/61634/jharkhand-claims-success-nregs-implementation-reality-far-different/>

⁶⁴ Corbridge, S. (2003) The continuing struggle for India’s Jharkhand: Democracy, decentralisation and the politics of names and numbers. In A. Wyatt, & J. Zavos (Eds.) Decentring the Indian Nation. London: Frank Cass.

⁶⁵ Jha, V. D. (2016, May 15). Barrage that didn’t help farmers – 33-year old project over river Amanat forgotten. The Telegraph. https://www.telegraphindia.com/1160515/jsp/jharkhand/story_85678.jsp

⁶⁶ SANDRP (2016).

⁶⁷ Joshi, P. K. (2015). Has Indian agriculture become crowded and risky? Status, implications and the way forward. Indian Journal of Agricultural Economics, 70(1), 1-41; Chand, R., Lakshmi, Prasanna, P. A., Singh, A. (2011). Farm size and productivity: Understanding the strengths of smallholders and improving their livelihoods. Economic and Political Weekly, XLVI(26 & 27), 5-11.

exposed in Jharkhand whereby muster rolls have been fudged, machines used in place of manual work, and corruption found in procurement of materials.⁶⁸ A recent newspaper articles shows that a disabled farmer and his wife, from Latehar, supposedly earned over 24,000 rupees in 2016, yet neither had worked a single day nor received a rupee: his job card, bank passbook and Aadhaar number had been taken from him by a local contractor.⁶⁹ Other anomalies are evident too, such as payments being made to other persons' bank accounts,⁷⁰ disruption in funds, shortage of staff, and lack of accountability.⁷¹ Technological innovations by the government are being used to create a new system of corruption, in which computer operators collude with middlemen to use digital signatures and generate fake muster rolls and authorise fake payments. Villagers with pre-existing bank accounts were asked to open Jan Dhan accounts, with their payments subsequently getting lost. Not receiving payment for their hard work, some villagers have understandably given up working under MGNREGA.⁷² Moreover, according to Siraj Dutta, excessive centralisation of the MGNREGA programme by the government is killing its essence and spirit.⁷³

Photo 1.2: A lift irrigation system in Potka block, East Singhbhum, which never irrigated a single crop



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- ⁶⁸ Aggarwal, A. (2016). The MGNREGA crisis. Insights from Jharkhand. EPW, LI(22), 38-43.
- ⁶⁹ Narayanan, R. (2017, July 1). Aadhaar and multiple identity disorder. Business Standard. <http://www.im4change.org/latest-news-updates/aadhaar-and-multiple-identity-disorder-rajendran-narayanan-4682231.html>
- ⁷⁰ Dutta, S. (2016, November 22). Excessive centralisation by Modi government is undermining MGNREGA. The Wire. <https://thewire.in/81623/centralisation-mnrega-undermining/>
- ⁷¹ Aggarwal, A. (2016).
- ⁷² How tech is undoing NREGA in Jharkhand (2017, February 16). The Times of India. <http://timesofindia.indiatimes.com/india/how-tech-is-undoing-nrega-in-jharkhand/articleshow/57175473.cms>
- ⁷³ Dutta, S. (2017, April 27). Modi government's tech fetish is diluting MGNREGA's accountability. The Wire. <https://thewire.in/128900/technology-fetish-diluting-mgnrega-accountability-transparency/>
- ⁷⁴ IBEF (2016). About Jharkhand: Information on mining industries, economy, agriculture and geography. India Brand Equity Foundation. <http://www.ibef.org/states/jharkhand.aspx>

Impacts of mining and power generation projects

Jharkhand owns 40 percent of India's mineral reserves and 29 percent of its coal reserves.⁷⁴ Mining in Jharkhand started long before Indian independence but has increased rapidly thereafter. As currently conducted, mining causes the "loss of agro-based livelihood, a decrease of natural capital, and an increase in pollution and ill health"⁷⁵ at a large scale. Large tracts of forest have disappeared, and water, groundwater and air have been polluted, robbing many rural communities of their access to essential common goods. The negative impacts on the environment extend far beyond the immediate mining site, as land has to be converted not only for the mining activities, but also for the required infrastructure, depositing and processing facilities; so that the "land affected by mining is many times larger than the simple lease area".⁷⁶ In the coal belt around Bokaro illegal mining and deforestation are thought to have caused a rise in average temperatures of about 1.2 degrees between 2000 and 2010.⁷⁷ Besides this, air and water carry the pollutants, e.g. coal or uranium dust, in all directions, such that it adversely affects the human, agricultural and ecosystem health of the entire region.⁷⁸ Large-scale energy and mineral extraction projects have not only converted thousands of acres of fertile agricultural lands into unusable, barren lands or waste dumps, but have also displaced lakhs of farmers, who have been forced into manual labour often outside of the state. According to one estimate, around 16 lakh hectares (20 percent of the total territory of present-day Jharkhand) have been diverted for the development of mines and dams since Indian independence, causing the displacement of around 40 lakh people,⁷⁹ and this process is continuing unabated.

A 2007 World Bank report addressing the challenges for inclusive development in Jharkhand recognized that agriculture and mining represent "two opposing views of the development debate". The report recommended the endorsement of a "middle path, aiming at an inter-temporal balance between the two strategies".⁸⁰ Yet unless mining and other industrial practices are drastically altered, and principles of transparency, proper participation and compensation to communities, and use of latest non-polluting technologies are incorporated, such a balance is an unachievable illusion. Jharkhand fares badly in governance indices: in 2016 the Public Affairs Centre ranked Jharkhand 16th of 17 large states in overall governance;⁸¹ whereas a 2012 study of the National Institute of Public Finance and Policy puts Jharkhand at rock bottom.⁸² A bulk of research on the so-called 'resource curse' shows that in contexts of weak governance, resource extraction leads to increasing inequality, worse governance, environmental destruction and conflict.⁸³ Farmers are disproportionately affected by such developments; and also the least likely to gain from them.

⁷⁵ Das, N. (2015). Socio-economic impact of mining on rural communities. A study of the Ib Valley coalfield in Odisha. PhD thesis. National Institute of Technology, Rourkela. http://ethesis.nitrkl.ac.in/6913/1/Nabanita_509HS304_PhD_2015.pdf

⁷⁶ Priyadashi, N. (2008, November 16). Impact of mining and industries in Jharkhand. American Chronicle. <http://www.sacw.net/article302.html>

⁷⁷ Shekhar, S. (2010, March 26). Bokaro now a heat chamber - Temperatures touch 42°C, old timers say it's abnormal. The Telegraph. https://www.telegraphindia.com/1100326/jsp/jharkhand/story_12264249.jsp

⁷⁸ Iron is Hot, a documentary directed by Biju Toppo and Meghnath, produced by Akhra.

⁷⁹ Swamy, quoted in Jitendra (2017, January 15). People of no land. Down to Earth. <http://www.downtoearth.org.in/news/people-of-no-land-56671>; see also data in Ekka, A. (2011). Jharkhand. Status of Adivasis/indigenous peoples land series-4. New Delhi: Aakar and The Other Media.

⁸⁰ World Bank (2007). India - Jharkhand: Addressing the challenges of inclusive development. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/7739>

⁸¹ Chatterjee, S. (2016, June 2). These 10 charts show how Indian states fare in terms of governance. The NEWS Minute. <http://www.thenewsminute.com/article/these-10-charts-show-how-indian-states-fare-terms-governance-44234>

⁸² Mundle et al. (2012). The quality of governance: How have Indian states performed. http://www.nipfp.org.in/media/medialibrary/2013/04/wp_2012_104.pdf

⁸³ Ross, M. L. (1999). The political economy of the resource curse. *World Politics*, 51(2), 297-322; Ross, M. L. (2015). What have we learned about the resource curse? *Annual Review of Political Science*, 18, 239-259.

Which way forward?

Regardless of the high social and environmental costs, large-scale development projects continue to be projected as the preferred or only mode of development by the state; and this view is endorsed by all major political parties and the bureaucracy. This is likely to be the status quo for the coming decade or so: under a business-as-usual scenario, India's coal use is likely to stabilise only in 2040.⁸⁴ In 2015 Jharkhand was ranked 3rd among Indian states in the World Bank "ease-of-doing-business list", though it slipped to 7th place in 2016. Late 2016 saw Jharkhand legislators attempt to pass amendments to the century old Chotanagpur Tenancy (CNT) and Santhal Parganas Tenancy (SPT) acts, which had to an extent checked the alienation of tribal land against industrial or commercial uses.⁸⁵ Subsequent protests led to the deaths of at least seven farmers in Hazaribagh, Ramgarh and Khunti districts. After pushing forward with the Land Bank, in February 2016 the incumbent Chief Minister hosted a Global Investors' Summit in Ranchi, during which some 3 lakh crore rupees have been pledged for investment.⁸⁶ This happened despite the fact that promised jobs and other opportunities for the local population have not materialised after decades of such 'development'.⁸⁷

Under increasingly difficult conditions, about 80 percent of the rural population of Jharkhand continue to depend on agriculture.⁸⁸ Agriculture not only sustains the population where other development activities have failed, but is also a 'culture' in its own right; a way of life. Developing the agricultural sector in Jharkhand requires a lot of input, dedication and commitment from the government and its agencies. Yet above all a vision is required that is supportive of the local population's health, livelihood and well-being. While the government and many NGOs are focussed largely on the externally developed, so-called conventional agriculture (hybrids and chemical inputs, loans and subsidies), some NGOs and civil society organisations, such as Society for the Promotion of Wastelands Development (SPWD), Vikas Sahyog Kendra (VSK) in Palamau, and Jharkhand Jungle Bachao Andolan (JJBA) to name but a few, are working to support and promote the sustainable and organic/natural agricultural systems of the region. Evidence shows that traditional varieties of crops, grown under improved conditions (e.g. irrigation, using innovative farming techniques) can yield as well as 'conventional'/hybrids with chemical inputs, but without the negative side-effects.⁸⁹ Ultimately, this is a struggle between a sustainable and dignified way of life for farmers, versus the market capture of farmers' means of livelihood to generate profit for outsiders.

⁸⁴ Sanwal, M. (2016). Ratification politics. Climate change is a social problem. EPW (LI)38, 24-27.

⁸⁵ Jitendra, J. (2017). Amendments to century-old laws on tribal rights spark protest in Jharkhand. Down to Earth. <http://www.downtoearth.org.in/news/amendments-to-century-old-tribal-rights-laws-spark-protests-in-jharkhand-56411>

⁸⁶ Murthy, B. V., & Saran, B. (2017, February 17). Jharkhand pledged `3 lakh cr at global investors summit. The Hindustan Times. <http://www.hindustantimes.com/ranchi/jharkhand-pledged-3-lakh-cr-at-global-investors-summit/story-UFiRN1ef7kcabC1mRSOGEN.html>

⁸⁷ Singh, K.M., Meena, M. S., Singh, R. K. P., Kumar, A., & Kumar, A. (2012). Rural poverty in Jharkhand, India: An empirical study based on panel data. Patna: ICAR. <https://mpr.ub.uni-muenchen.de/45258/>

⁸⁸ IBEF (2016). About Jharkhand: Information on mining industries, economy, agriculture and geography. <http://www.ibef.org/states/jharkhand.aspx>.

⁸⁹ Vidal, J. (2014, March 18). India's rice warrior battles to build living seed bank as climate chaos looms. The Guardian. <https://www.theguardian.com/global-development/2014/mar/18/india-rice-warrior-living-seed-bank>; Dogra, B. (2017, July 10). Despite the myth, sustainable farming methods can lead to high-yield agriculture. The Wire. <https://thewire.in/155970/sustainable-farming-high-yield-agriculture/>; Nair, A. (2016, April 16). Debal Deb, India's rice warrior, finds rice species containing medicinal properties. The Indian Express.

<http://indianexpress.com/article/india/india-news-india/debal-deb-indias-rice-warrior-finds-rice-species-containing-medicinal-properties-2756734/>; Prabu, M. J. (2017, July 6). Farmer's notebook: How group organic farming empowered tribal farmers in Tamil Nadu. The Wire. <https://thewire.in/154813/organic-farming-empowered-tribal-farmers-tamil-nadu/>

2. Objectives of the study

The review of literature suggests there is an urgency to act now in order to prevent further damage to the health of the people as well as to the soil, land, forest and water resources they live off. In this context, a questionnaire survey was designed to collect up-to-date information from farmers on the crisis they're facing in agriculture, and to contrast farmers' needs and problems with what the government is providing to them. Though the survey has limitations with regards to its coverage of issues, it is designed to serve as a reference point for further work.

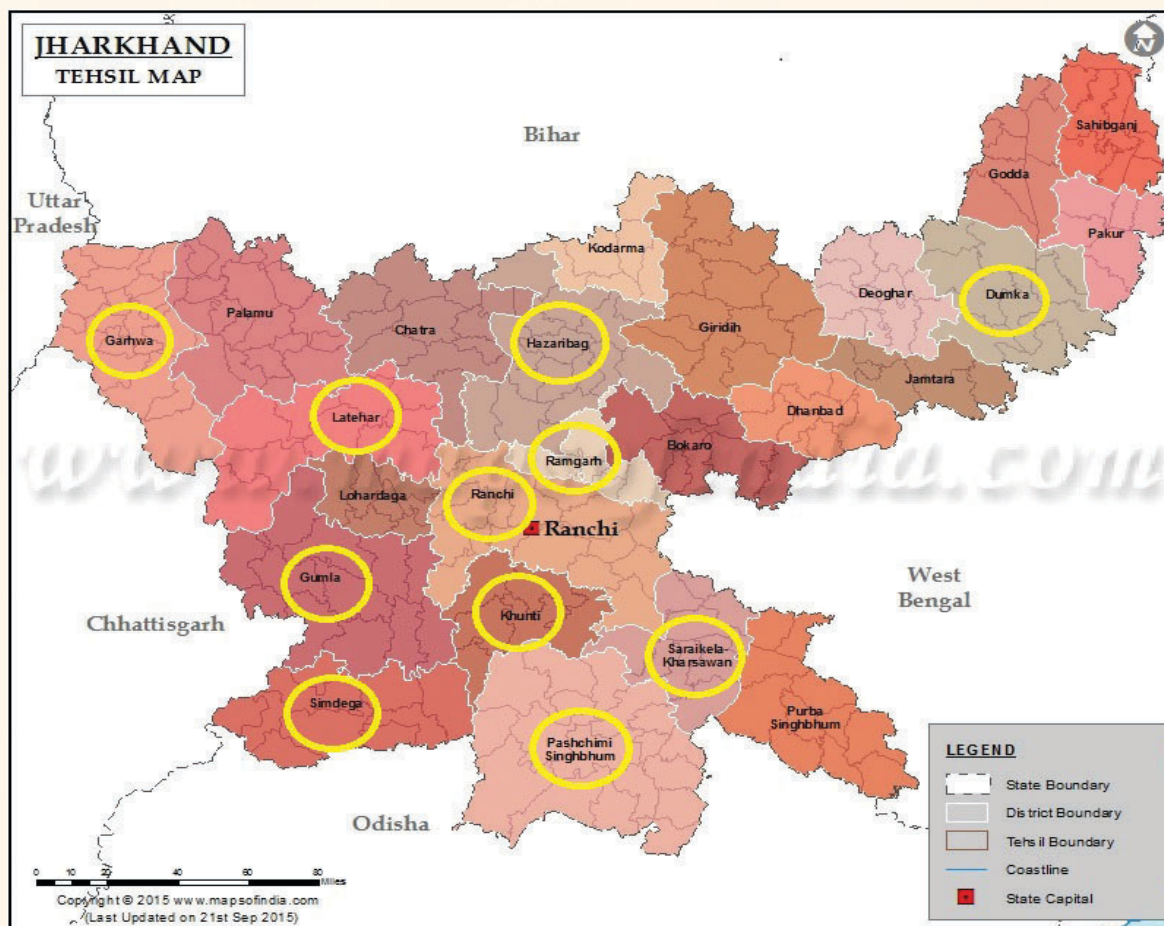
This survey was conducted prior to a two-day seminar – titled Present Agrarian Crisis in Jharkhand – held in Ranchi on 8th and 9th April 2017. The seminar brought together farmers and representatives from civil society organisations working in Jharkhand and elsewhere in India. Its outcomes in the form of demands are given in Appendix 1.

3. Methodology

The farmer survey questionnaire format, with its 180 or so questions (Appendix 2), was developed over the course of three meetings with BIRSA's field staff; who themselves are farmers. The survey forms were prepared in Hindi and where possible pre-coded, to save time during data entry. The third meeting discussed and devised the sampling method. The survey was conducted from mid-February to mid-March 2017; and most enumerators had attended at least one training session. We attempted to take a sample of villages/districts from across Jharkhand keeping in mind the three agro-climatic sub-zones of Jharkhand (map 3.1), and driven by the availability of BIRSA field staff.

493 interviews were conducted in 30 villages of 11 districts (table 3.1). Sub-zone VI, the south eastern plateau sub-zone, is under-represented with just 14 percent of the total number of surveys having been conducted in West Singhbhum and Saraikela Kharswan districts (table 3.1). In each district the field workers were directed to select three or four villages, according to the following criteria: one village should be ST dominated, another mixed; and one village should be close to the forest and remote, another in a plains area more closely connected to markets. A sample of 15-20 households were to be selected in each village to include large, medium, small and marginal farmers, and to be representative of the various jaat make-up of the village, e.g. if half of the villagers were Munda, then half of the sample would be with Munda farmers. For the purpose of analysis, the districts are grouped into six clusters, which are labelled according to the erstwhile district boundaries, e.g. Gumla and Simdega districts come under 'Gumla cluster', and Latehar and Garhwa districts under 'Palamau cluster' (table 3.1). A list of all the villages where surveys were conducted is given in Appendix 3.

Map 3.1: Jharkhand, with sample districts highlighted in yellow



Source : adapted from <http://www.mapsofindia.com/maps/jharkhand/tehsil/>

Table 3.1: Number of villages and surveys conducted in each cluster (and district)

No.	Cluster	District	No. villages	No. surveys	Total no. surveys (%)
1	Dumka	Dumka	4	60	60 (12%)
2	Palamau	Garhwa	4	64	99 (20%)
		Latehar	2	35	
3	Hazaribagh	Hazaribagh	3	46	53 (11%)
		Ramgarh	1	7	
4	Ranchi	Ranchi	3	52	133 (27%)
		Khunti	4	81	
5	Gumla	Gumla	2	40	79 (16%)
		Simdega	3	39	
6	Singhbhum	West Singhbhum	3	49	69 (14%)
		Saraikela Kharswan	1	20	
Total	6	11	30	493	493

We aimed that roughly 50 percent of the sampled households should be adivasi (Scheduled Tribe) to reflect the rural demography of most of Jharkhand's districts. In the final count, 74 percent of respondents were adivasi: including Munda (133 households), Santhal (68 households), Oraon (55 households), Ho (39 households) and Kharia (25 households), but also some Binjhia, Korwa, Lohar, Kharwar and Chit Baraik households. Adivasis are thus over-represented. The remaining households fell under 'Other Backward Castes' (14 percent) and 'Scheduled Caste' (12 percent) categories. Of the 59 SC households interviewed, 92 percent (54 households) live in the Palamau and Hazaribagh clusters; whereas the OBC households are well distributed across the six clusters.

In an attempt to overcome the inherent bias towards male farmers, we designed the survey so that the respondents of each survey should include one male and one female. In the end, 79 percent of the surveys were conducted with male-female pairs; and the remainder with just one respondent, bringing the total number of respondents to 882. The average age of the primary respondents was 46 years (n=481 out of 493), whereas the average age of all respondents (n=864 out of 882) was 43 years. Family size ranges from just one to 21 members, with an average of 5 or 6 members. Analysis is made at the household level.

Data entry took place in the second half of March. The data was consolidated into one Excel sheet and thoroughly checked against the filled survey forms. When necessary, respondents were called to check information. In several cases BIRSA's field staff came to Ranchi to meet the principal investigator to discuss their filled survey forms. In particular, the complicated section requiring data pertaining to landholdings was filled incorrectly by many field staff, and they were asked to correct it – and if necessary, call the respondents to clarify the information. Land data from Dumka was provided in bighas and katha (the local unit) and had to be converted into acres and decimals. Further coding was then undertaken, to add codes where pre-coding had not been possible and to remove redundant codes. Analysis was then conducted using both Excel and SPSS. For the purpose of the seminar in April, and due to time constraints, a preliminary analysis was made using Excel. SPSS was later used to analyse correlations between different characteristics of the farmers (e.g. landholding size, district, migrant, social category e.g. ST or OBC, etc.) and practices (e.g. cultivation of wheat, use of hybrid rice, access to irrigation, etc.).

FINDINGS

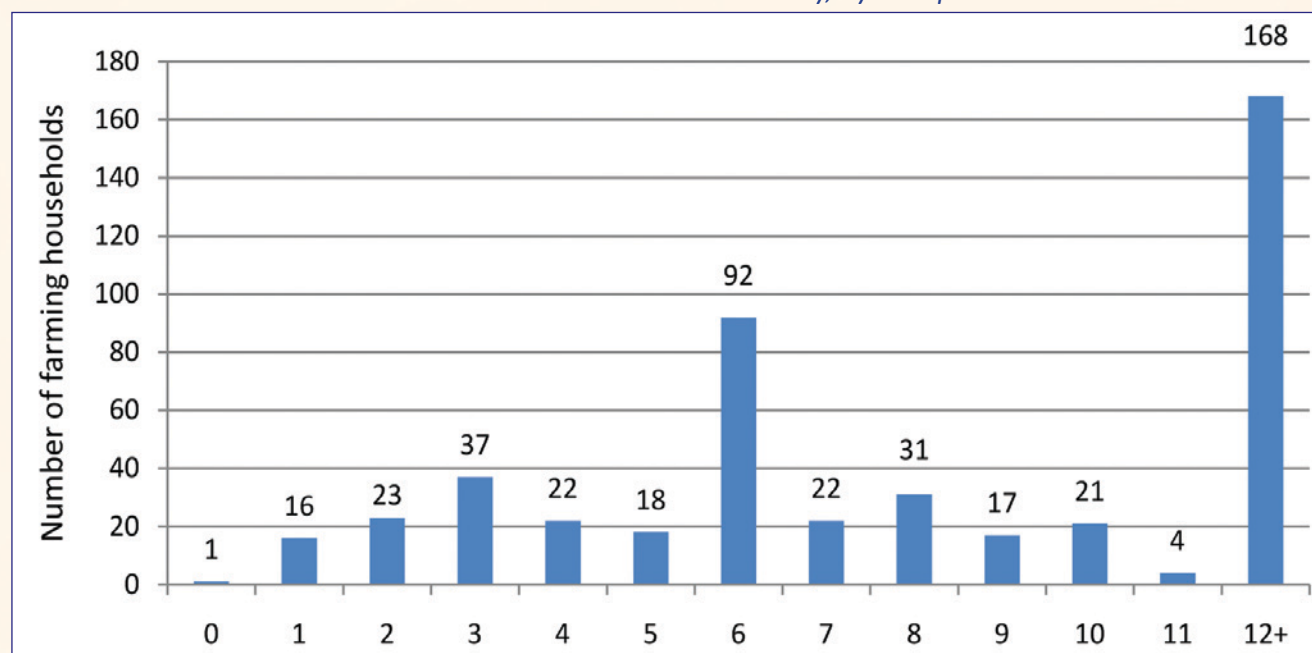
4. Livelihoods and migration

Primary and secondary livelihoods: Agriculture and wage labour

Jharkhand is among the economically poorest of Indian states with 40.3 percent of its population living below the official poverty line; the number rising to 46.3 percent in rural areas (the national average is 27.5).⁹⁰ 96 percent of this study's surveyed households said that 'agriculture' was their primary livelihood, and 80 percent said that 'wage labour' was their second most important livelihood. 85 percent of respondents said they were generally happy with farming as an occupation; which fits with the finding of the CSDS study (2014, p.8) that 84 percent of farmers in central India like farming as a profession. Only 6 percent of the surveyed respondents (n=483) said they would quit farming if they had an alternative, and almost all farmers (94 percent) said that they want their children to continue farming. This finding is at odds with that of the CSDS study, which showed that less than one-fifth of farmers wanted their children to continue farming.

Much of rural Jharkhand's population is food insecure. A nutrition atlas released in 2017, created by the National Institute of Nutrition, ranks Jharkhand first place of India's states in terms of prevalence of wasting.⁹¹ In an assessment published in 2008 based on both intake (of calories) and outcome measures (anthropometric indicators of malnutrition, i.e. stunting), Jharkhand secured the ranking of being the most food insecure state in India.⁹² Comparison of the two indicates that nothing much has changed in the past ten years. Our data shows that just 36 percent of farming households (168 farmers) produce an annual

Chart 4.1: Number of months of food security, by own production



⁹⁰ Ministry of Social Justice and Empowerment (2005). State-wise percentage of population below poverty line by social groups, 2004-05. <http://socialjustice.nic.in/UserView/index?mid=76672>

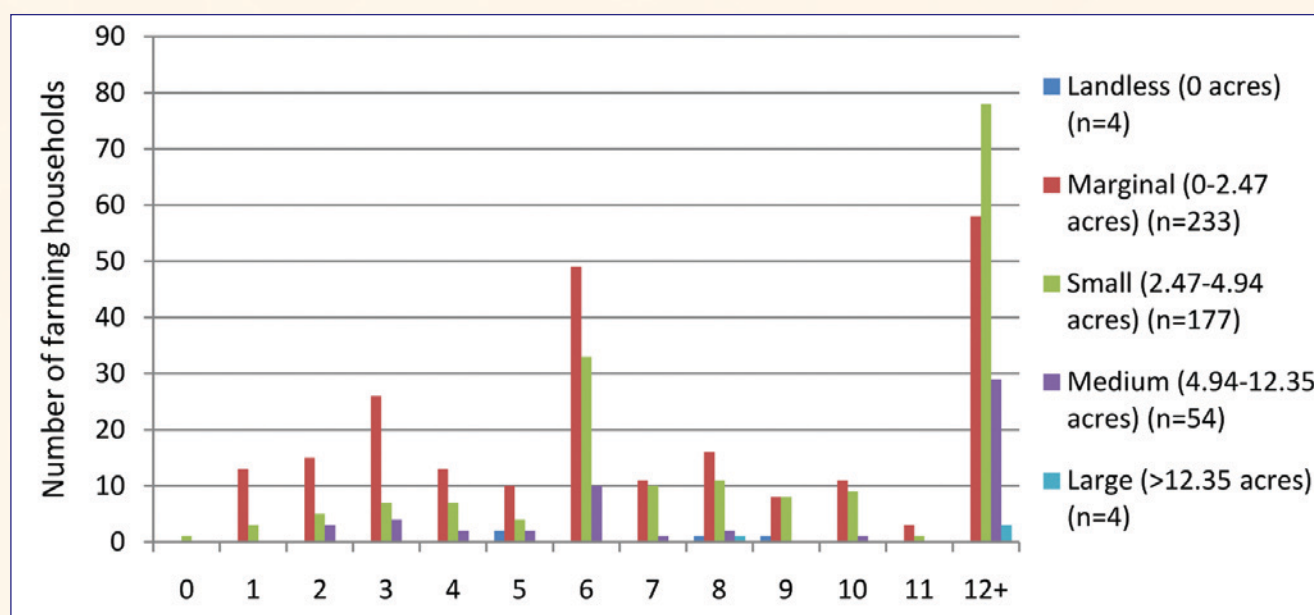
⁹¹ Sharma, D. C. (2017, September 8). Country's first 'nutrition atlas' comes online. The Wire. <https://thewire.in/175503/nutrition-institute-atlas-obesity-malnutrition-interactive/>

⁹² MSSRF (M.S. Swaminathan Research Foundation)/WFP (World Food Programme). (2008). Report on the state of food insecurity in rural India. Chennai: Nagaraj and Company Private Limited.

surplus from their fields, allowing them to be food secure through the year (chart 4.1). At the other end of the scale, 25 percent of the households (117 farmers) are highly food insecure, producing enough food for just five or less months each year.

The 36 percent of food secure farmers does not only include those cultivating large landholdings: 46 percent (78 farmers) of food secure farmers cultivate between 1 and 2 ha land, and 35 percent (58 farmers) of food secure households cultivate less than 1 ha of land (chart 4.2). Of the 117 farming households food secure for less than 5 months of the year, 68 percent cultivate less than 1 ha of land, however 23 percent cultivate between 1 and 2 ha, and 9 percent between 2 and 5 ha. Thus the data shows that there is no straight forward relation between the size of cultivated landholding and food security; and that households farming less than 1 ha (2.47 acres) of land can be food secure.

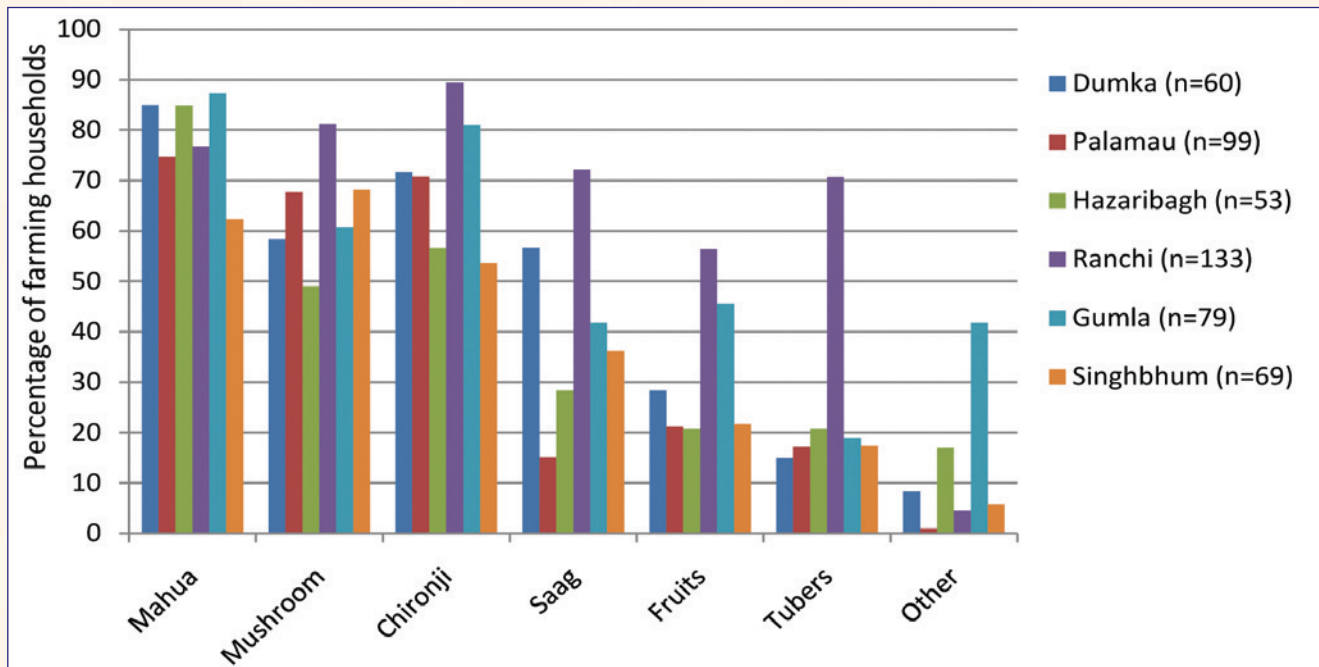
Chart 4.2: Number of months of food security by own production, by cultivated landholding group



Supplemental food items collected from surroundings

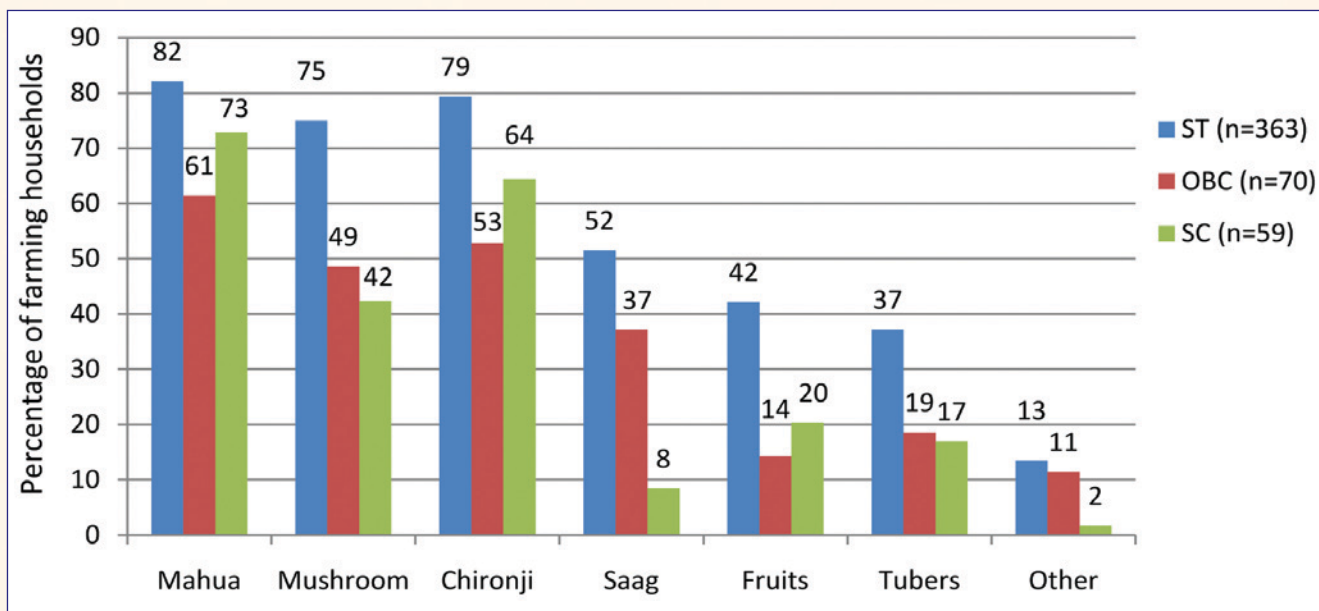
Most households in rural Jharkhand rely for a part of their nutritional intake on the natural environment. Our survey found that 91 percent of households (n=493) supplement their grown and purchased food with items collected from their surroundings. 78 percent of households collect mahua (the edible flower of the mahua tree), 67 percent mushrooms, 74 percent chironji nuts and seeds, 44 percent different types of 'saag' (edible green leaves that are used in cooking), 35 percent fruits and 32 percent tubers. Chart 4.3 shows the percentage of farming households in each cluster that collect the different wild foods. For example, we can see that mahua is collected by 87 percent of households in Gumla cluster, by 85 percent of households in Dumka and Hazaribagh cluster, but by just 62 percent in Singhbhum cluster. Mushroom collection is most widely practised in Ranchi and Khunti, where 81 percent of households engage in this activity. Collection of chironji nuts and seeds is practised most widely in Ranchi and Gumla clusters, followed by Dumka and Palamau cluster. Wild saag, fruits, and tuber collection is most popular in the sampled households of Ranchi and Khunti districts, where 72 percent, 56 percent and 71 percent of households collect them, respectively.

Chart 4.3: Edible food items collected from the surroundings, by cluster



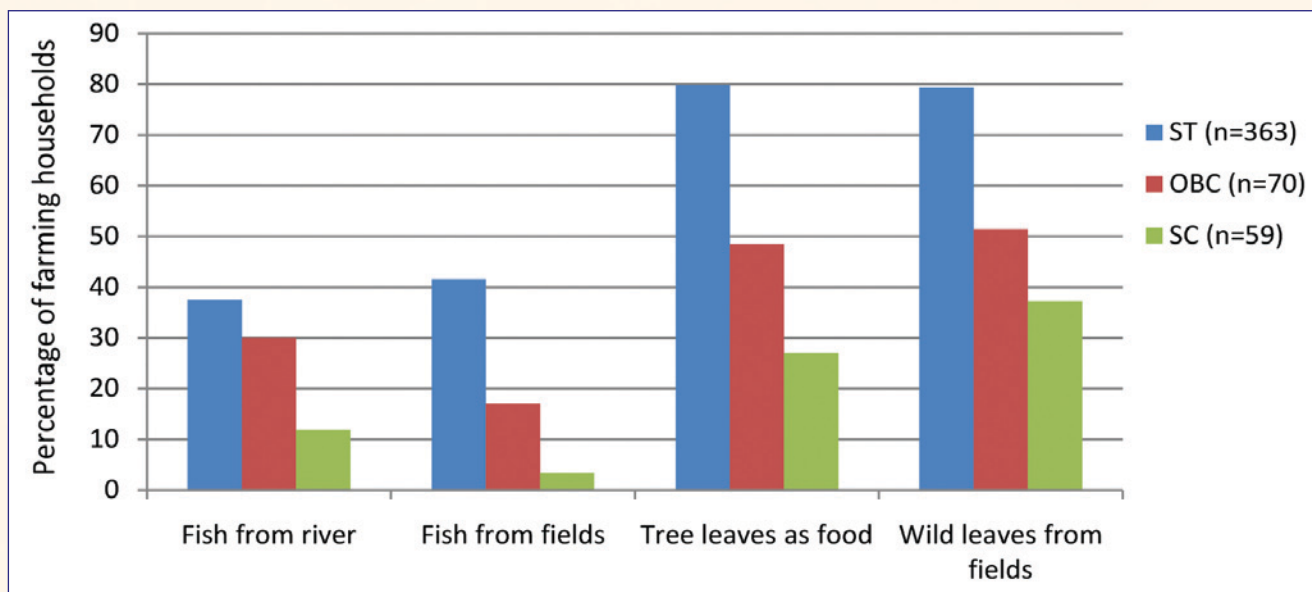
A higher proportion of Scheduled Tribe (ST) households, as compared to 'Other Backward Caste' (OBC) and Scheduled Caste (SC) households, collect wild edible foods (chart 4.4). However, the data also makes clear that collection and use of wild edible foods is important to households across all social categories, and that contrary to popular belief, foraging for foods is not only practised by adivasis.

Chart 4.4: Edible food items collected from the surrounding, by social category



33 percent of households claimed to catch fish in a nearby river, and 33 percent said they catch fish in their paddy fields in the kharif season. Over two-thirds (69 percent) of households pluck tree leaves to cook as a food, and 70 percent pick wild edible leaves from the fields. Breaking this down by social category, a larger proportion of ST households catch fish and collect tree/wild leaves as compared to other communities (chart 4.5). The nutritional contribution of these activities needs to be properly enumerated, but it's safe to say that the commons are an important resource for the rural people of Jharkhand, and therefore need to be protected from pollution, be it industrial, urban waste, or chemical agricultural inputs' residues.

Chart 4.5: Fishing and collection of wild leaves as food, by social category



When asked, one-third (33 percent) of respondents said that they believe these wild sources of food have been negatively affected by pollution/deforestation in the past ten years. 143 farmers gave a reason, with 50 farmers blaming deforestation and the cutting of trees, and 41 farmers saying that cultivation of the non-food product lac, is affected by air pollution and mobile phone towers.

Migration

151 households (31 percent) have migrants (n=493). A slightly higher proportion of SC households have migrants as compared to ST and OBC households, yet according to our data, landholding size doesn't affect whether or not a member of the household migrates. Chart 4.6 shows from where people migrate, highlighting that in our sample, the largest proportion of migrants (48 percent) hail from Latehar and Garhwa districts. The villagers migrate for a variety of reasons. 54 percent migrate for higher income/wages and 49 percent migrate due to lack of employment at home, while 21 households gave both these reasons (n=146). Lack of ability to grow more than one crop in the year is also a significant factor leading to migration, as stated by 16 percent of migrant households. Just six households said that someone migrates to repay debt.

Chart 4.6: Proportion of households with and without migrants, by cluster

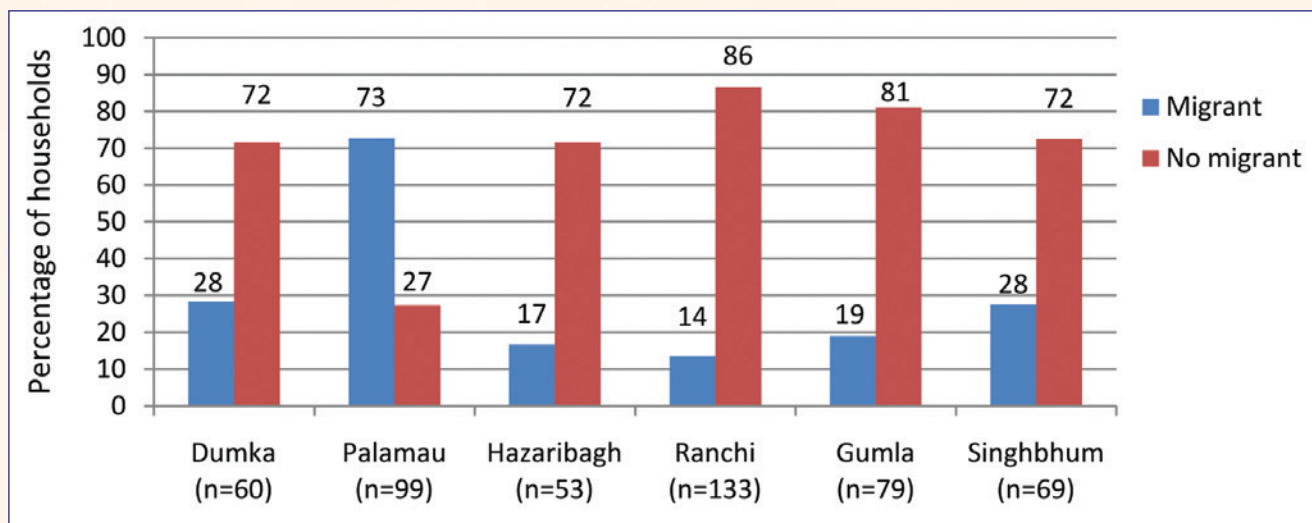
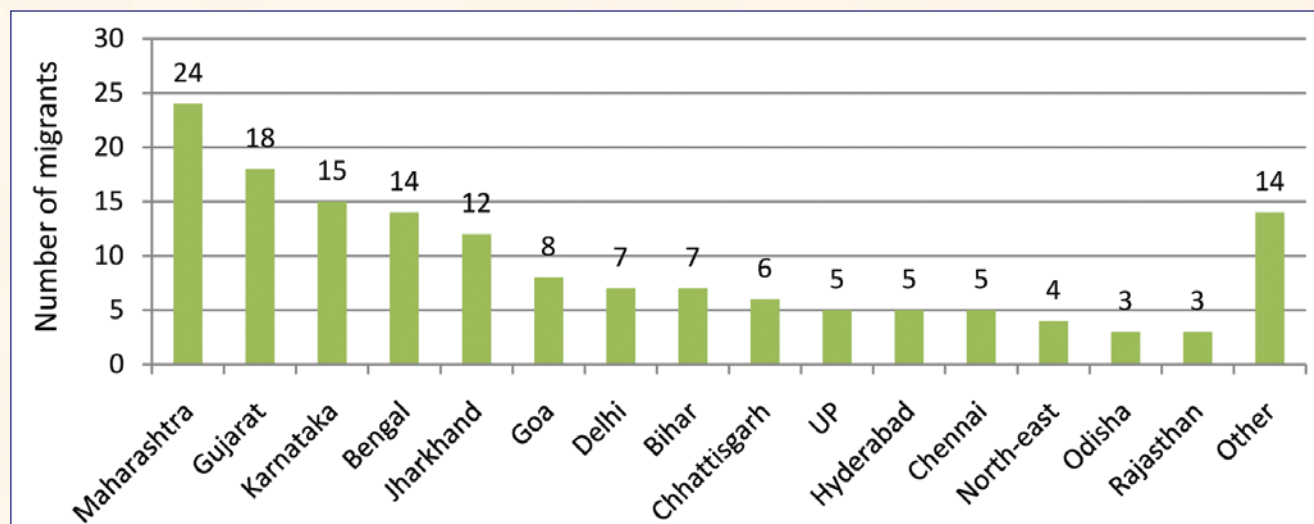


Chart 4.7 shows the most popular destinations of migrants; the top four being Maharashtra, Gujarat, Karnataka, and West Bengal. Jharkhand itself is the fifth most stated destination. Around half (52 percent) of respondents stated that their migrating family members are away from the village for six months of the year, with a further quarter away for over six months of the year. That 88 percent of migrants are gone for 10 or less months of the year suggests that the work is informal, and that migrants return to their village to participate in seasonal farm work.

Chart 4.7: Destination of migrants (n=150)



5. Landholdings pattern

To understand the cultivated landholdings of a household in Jharkhand is not a straight forward task. Villagers own don (lowland) and tanr (upland) as well as homestead land; and some of these lands may be uncultivated. Additionally, many households farm land that is officially categorised as ‘forest’ or ‘gairmazrua’ (g.m.) land. Though this land may have been cultivated for generations, the household has no title to it. Households also give out and take in land on share or contract basis. There is thus a marked difference between owned land and cultivated land. The survey was designed to capture all of these aspects.

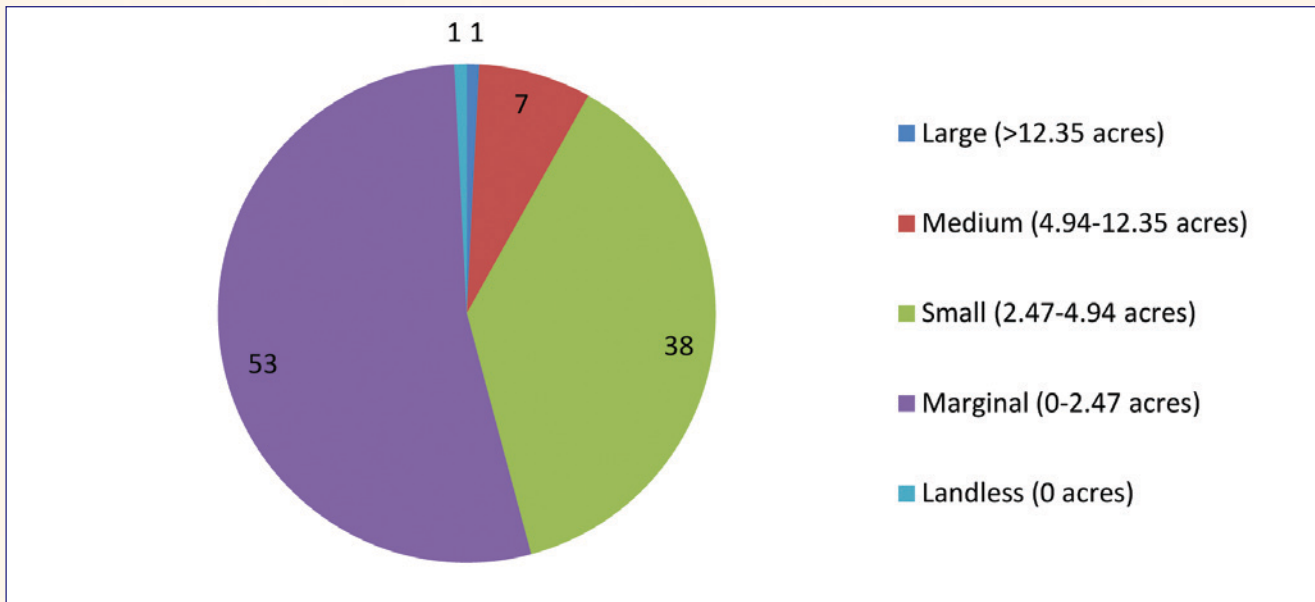
Owned land

The landholding distribution pattern of the sampled households is calculated based on owned land (cultivated and uncultivated), and following the Indian classification system, i.e. large >12.35 acres, medium >4.94-12.35 acres, small >2.47-4.94 acres, marginal >0-2.47 acres, and landless, 0 acres.

91 percent of the surveyed farming households own up to 2 hectares of land (almost 5 acres). Just over half (53 percent) are marginal farmers, owning land up to 2.47 acres (up to 1 hectare), and 38 percent are small farmers, owning between 2.47 and 4.94 acres (between 1 and 2 hectares). 36 farming households (7 percent) are medium size farmers, owning between 2 and 5 hectares, whereas just four of the sampled households have landholdings larger than 5 hectares, and four are landless (1 percent respectively). Chart 5.1 shows this distribution in the form of a pie chart.

The mean average landholding is 2.67 acres and the median average is 2.25 acres (n=493). Excluding uncultivated homestead land (upon which house is built), on average 2.31 acres of owned land is under cultivation, and 0.30 acres per household is kept idle (n=493). In fact, 197 households stated that some of their land is uncultivated: an average of 0.75 acres, ranging from 0.01 to 10 acres.

Chart 5.1: Landholding (owned) distribution of the farming households (n=493)



Forest land

20 percent of the sampled households (98 households) cultivate a total of 103.8 acres of farmland categorised by the government as forest land. For the 98 households cultivating forest land, this is a mean average of 1.06 acres per household (with a median average of 0.50 acres), ranging from 2 decimals to 5 acres per household. For the overall sample of 493 farmers, an average of 0.21 acres of forest land is cultivated.

Gairmazrua land

The special protective measures to prevent land alienation of adivasis in Jharkhand include the Scheduled Areas legislation, cross-cut by the Chotanagpur Tenancy (CNT) and Santhal Parganas Tenancy (SPT) Acts.⁹³ The CNT Act provides community rights to land classified as gairmazrua (g.m.) land, of which there are two types: gairmazrua khas, which is open access for grazing and other purposes, and could traditionally be taken under cultivation with permission from the headman, and gairmazrua am, which are community lands used as graveyards, sacred groves, and roads.⁹⁴ Despite the provisions, and without consulting villagers, the Government of Jharkhand recently formed a Land Bank comprising the g.m. land of many villages. In doing so, it has notified villagers that their land – some of which they’ve cultivated for generations – can be taken at any time to be put to ‘development’ use. The situation regarding legal ownership of g.m. lands is however ambiguous. The Bihar Land Reforms Act 1950 had vested in the state all lands other than raiyati lands, renaming g.m. am land as ‘anabad sarva sadharan’ and g.m. khas land as ‘anabad sarkar Bihar’. Legally, therefore, all g.m. land in the state is ‘vested’ with the government (except in Mundari khuntkatti villages), which means that the government can make use of g.m. khas land without a legal acquisition process, but with the cooperation of local people.⁹⁵

⁹³ The Scheduled Areas include the districts of Ranchi, Khunti, Gumla, Simdega, Lohardaga, East and West Singhbhum, Saraikela Kharswan, Dumka, Jamtara, Sahibganj, Pakur, and one block of Garhwa, 7 blocks of Latehar, and 2 blocks of Godda. The CNT Act covers all the districts of Jharkhand, except for Dumka, Sahibganj, Godda, Deoghar, Jamtara and Pakur where the SPT Act applies (Sundar, 2009, pp. 21-23).

⁹⁴ Upadhyay, C. (2009). Law, custom, and adivasi identity: Politics of land rights in Chotanagpur. In N. Sundar (Ed.). Legal grounds: Natural resources, identity, and the law in Jharkhand (pp. 30-55). New Delhi: Oxford University Press.

⁹⁵ Upadhyay (2009), pp. 43-44. For further details, see the chapters in N. Sundar (Ed.). (2009). Legal grounds: Natural resources, identity, and the law in Jharkhand by Sharan, R. Alienation and restoration of tribal land in Jharkhand (pp. 82-112) and Rao, N. Conflicts and contradictions: Land laws in the Santhal Parganas (pp. 56-81).

For the total sample of 493 farming households, the total area of cultivated g.m. land is 83.3 acres; an overall average of 0.17 acres per household. 115 households (23 percent of the total surveyed households) cultivate the 83.3 acres of g.m. land, an average of 0.72 acres (median 0.40 acres), ranging from 2 decimals to 6 acres per household.

Share and contract farming

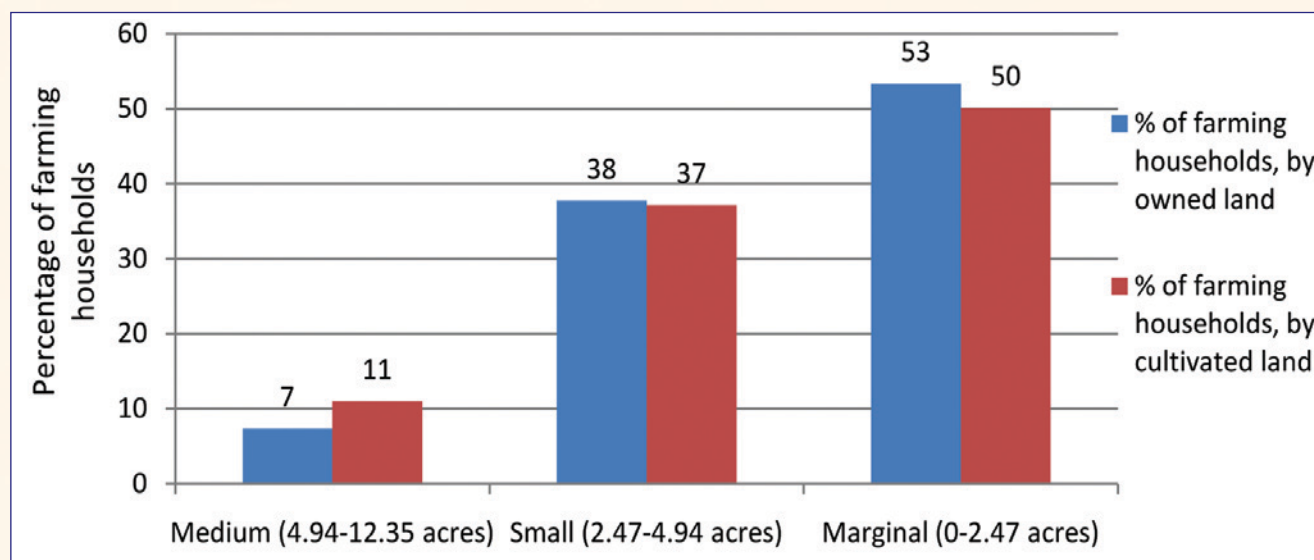
Leasing of land is widely prevalent in Jharkhand. It often occurs when absentee landholders allow another farmer to cultivate their land in exchange for half the produce, or for a fixed payment over a fixed period (e.g. 25,000 rupees for three years). A government survey found that about 10 percent of India's 140 million hectares of farmland was formally or informally leased out in 2012-13, and to this end, consultations have been held in India's states to discuss the problems faced by tenants.⁹⁶

144 of our surveyed farmers take in and/or give out land on share-cropping and contract basis. 97 farmers leased-in a total of 87.8 acres of land on share/contract basis, whereas 47 farmers gave out 43.9 acres of farm on share/contract. Therefore, among our sample there is an overall net increase in the total area under cultivation of 43.9 acres. It should be noted that our sample did not include absentee households (i.e. those with land but residing elsewhere).

Overall cultivated land

The overall mean average cultivated landholding, taking into account sharecropping, contract farming, forest land, g.m. land, and land left fallow, is 2.78 acres (median 2.4 acres), ranging from 0 to 16 acres. Thus, the actual amount of land under cultivation differs from that found in government records: while owned land under cultivation averages 2.31 acres per household, actual land under cultivation averages 2.78 acres per household; adding on average almost half an acre per household. Categorisation of farming households by cultivated landholdings (chart 5.2) brings the proportion of farming households classified as medium-sized farmers (having 2-5 hectares) to 11 percent of the total (54 farmers), up from 7 percent of households as categorised by owned land (36 farmers).

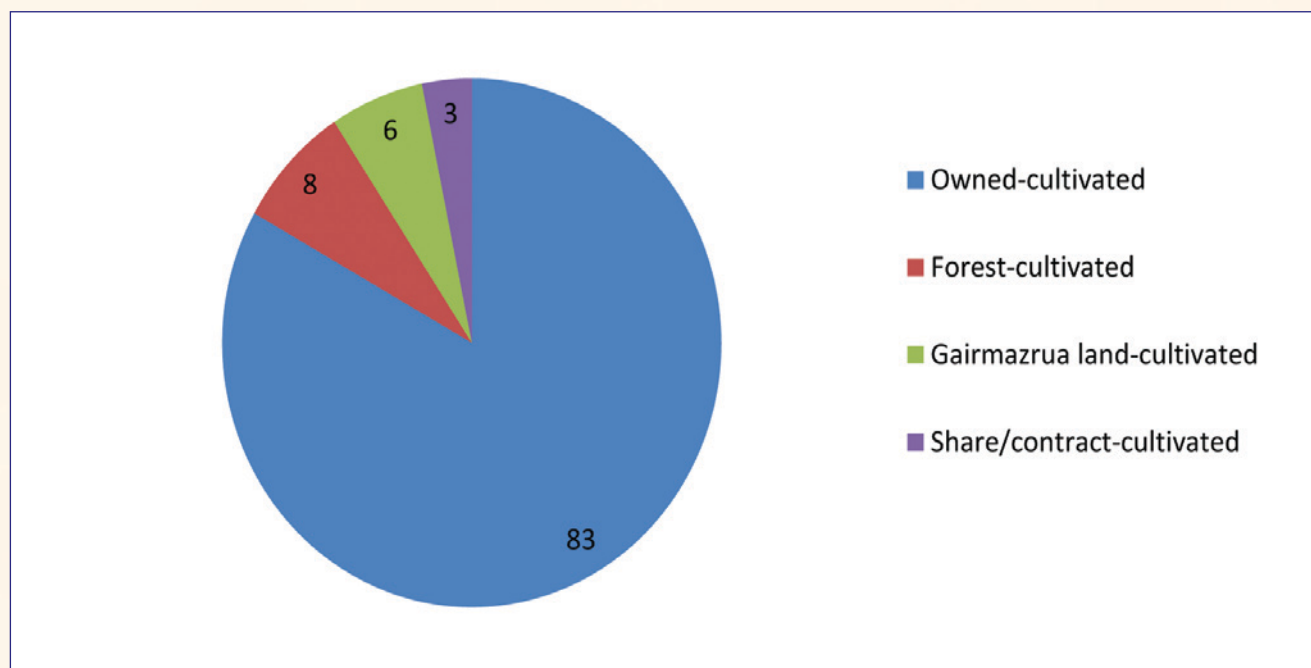
Chart 5.2: Cultivated landholding distribution of the farming households (n=493)



⁹⁶ Mohanty, B. K. (2016, January 8). Farmland-lease nod on table. The Telegraph. Retrieved from https://www.telegraphindia.com/1160108/jsp/nation/story_62759.jsp#.VpN2du%20Z8tM4

In sum, of the total 1371 acres of land cultivated by the 493 interviewed farming households, 83 percent is owned land, whereas the remaining 17 percent is forest land (8 percent), g.m. land (6 percent), and share-cropped/contract land (3 percent) (chart 5.3).

Chart 5.3: Overall share of total land cultivated (n=493), by land type



6. Crop types and varieties grown by farmers

In our questionnaire we divided the types of crops grown by farmers into four groups:

- Cereals (rice, maize, wheat, etc.)
- Pulses (kurthi, urad, rahar, etc.)
- Oileeds (til, sargunja, mustard, etc.)
- Vegetables (tomato, potato, brinjal, etc.)

We found that 83 percent of farmers (n=493) grow crops in all four categories, and another 10 percent of farmers grow crops in three of the four categories. On average, a household grows 10 or 11 different crops, while the range is from 0 to 31 different crops.

Cereals

The vast majority of respondents (98 percent) grow paddy, 54 percent (266 farmers) grow maize, 28 percent (140 farmers) grow wheat, 22 percent grow maduwa (finger millet), and smaller numbers grow barley, sorghum, foxtail millet (gondli) and some other cereals (chart 6.1). Needless to say there is variation across Jharkhand in the pattern of cereals grown. 93 percent of the surveyed farmers cultivating wheat are in the northern parts of Jharkhand (clusters Dumka, Hazaribagh, Ranchi, and especially Palamau). 94 percent of the sampled households growing maize are in the northern districts (mostly in the clusters Dumka, Palamau, and Hazaribagh, and less so in Ranchi and Singhbhum). Maize cultivation is negligible in the surveyed villages of Khunti, Gumla, Simdega, and Saraikela Kharsawan. Chart 6.2 highlights that maduwa (finger millet) is principally grown in Gumla and Ranchi clusters, and barley is mainly grown in Garhwa and Latehar (Palamau cluster).

Chart 6.1: Percentage share of respondents (n=493) growing various cereals

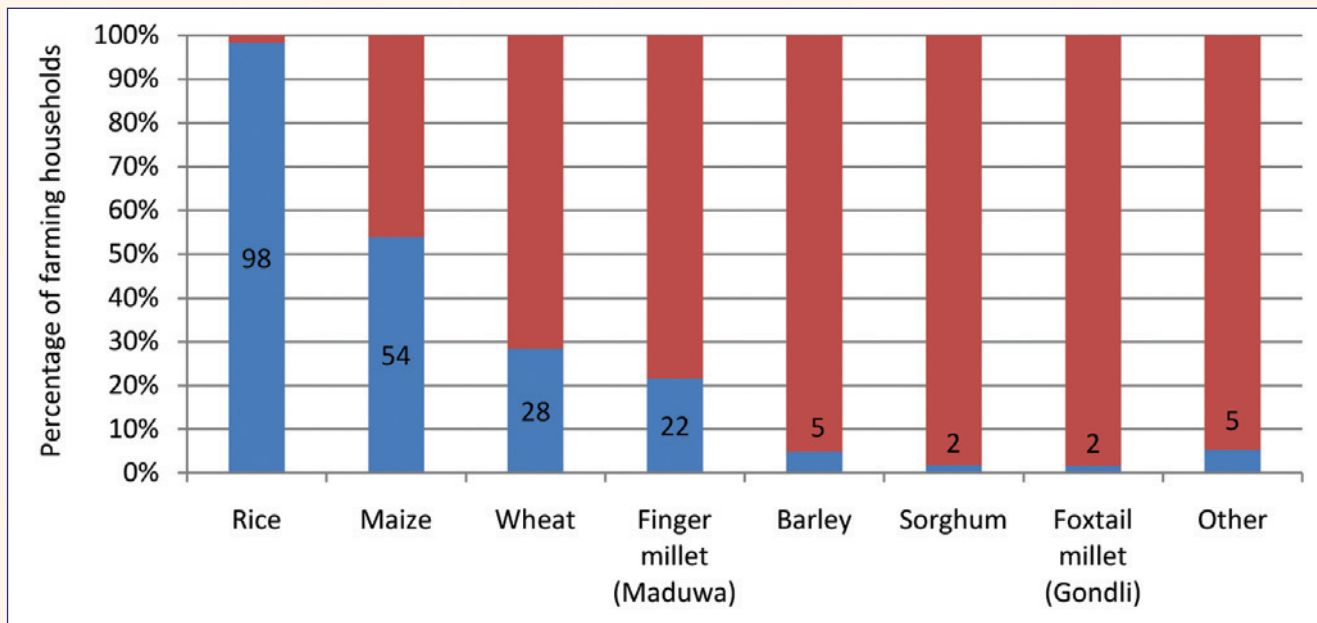
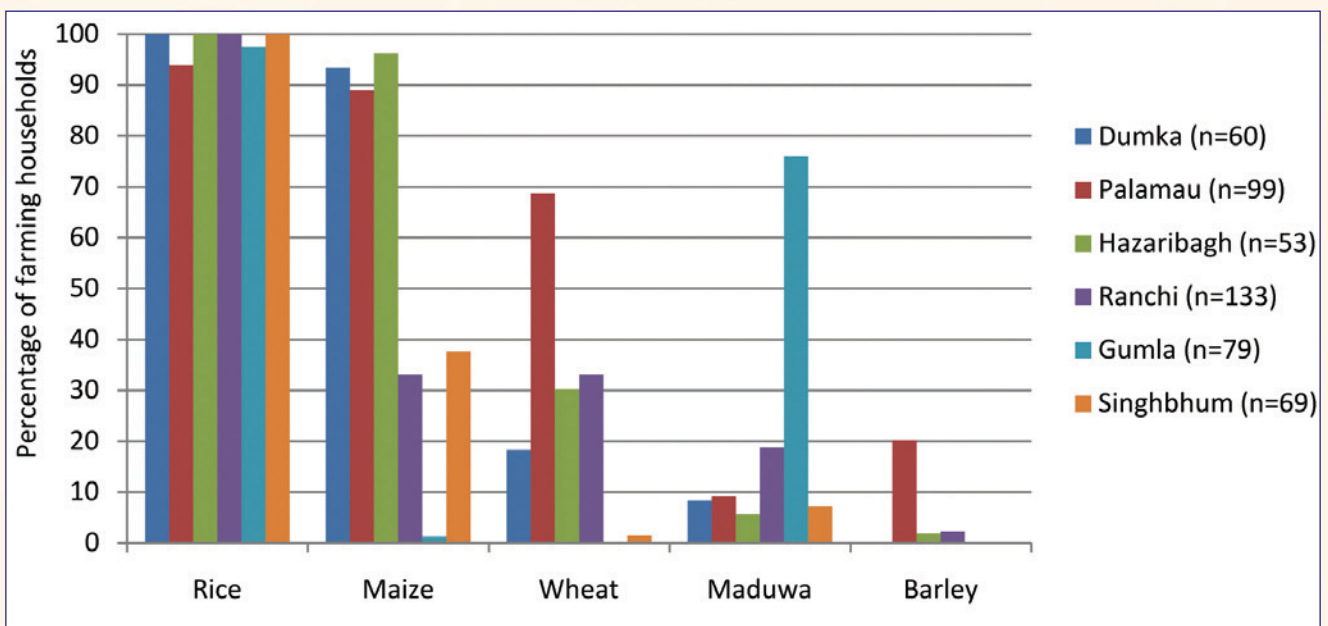


Chart 6.2: Percentage share of main cereals grown, by cluster



Landholding size does not appear to greatly affect the decision of which crop to grow, as indicated in chart 6.3, which shows that the proportion of farmers growing rice, maize, wheat, maduwa and barley is roughly the same across the categories of medium (2-5 ha), small (1-2 ha) and marginal (0-1 ha) farmers. The data also shows that a larger proportion of SC farmers (n=59), followed by OBC farmers (n=70), grow maize, wheat and barley, whereas for finger millet the opposite is true, with more ST farmers (n=364) growing maduwa (chart 6.4).

Chart 6.3: Percentage share of main cereals grown, by landholding size

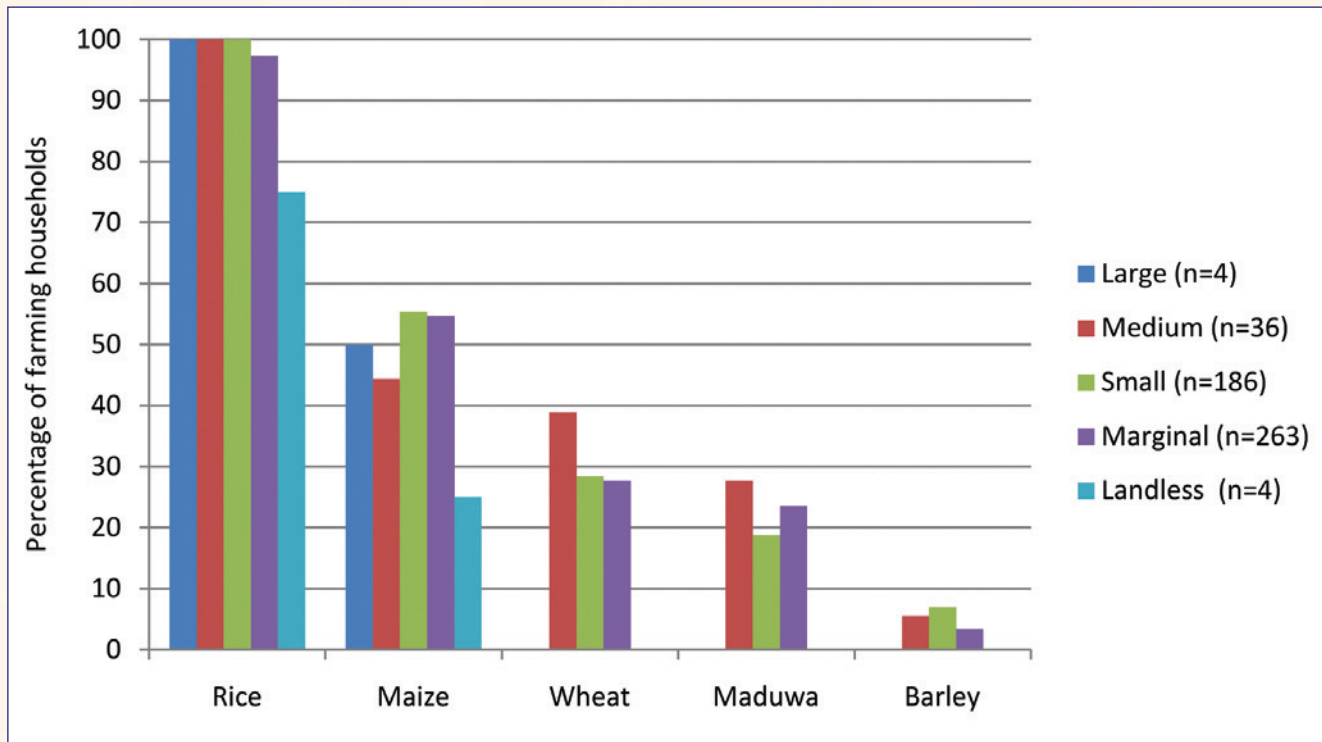
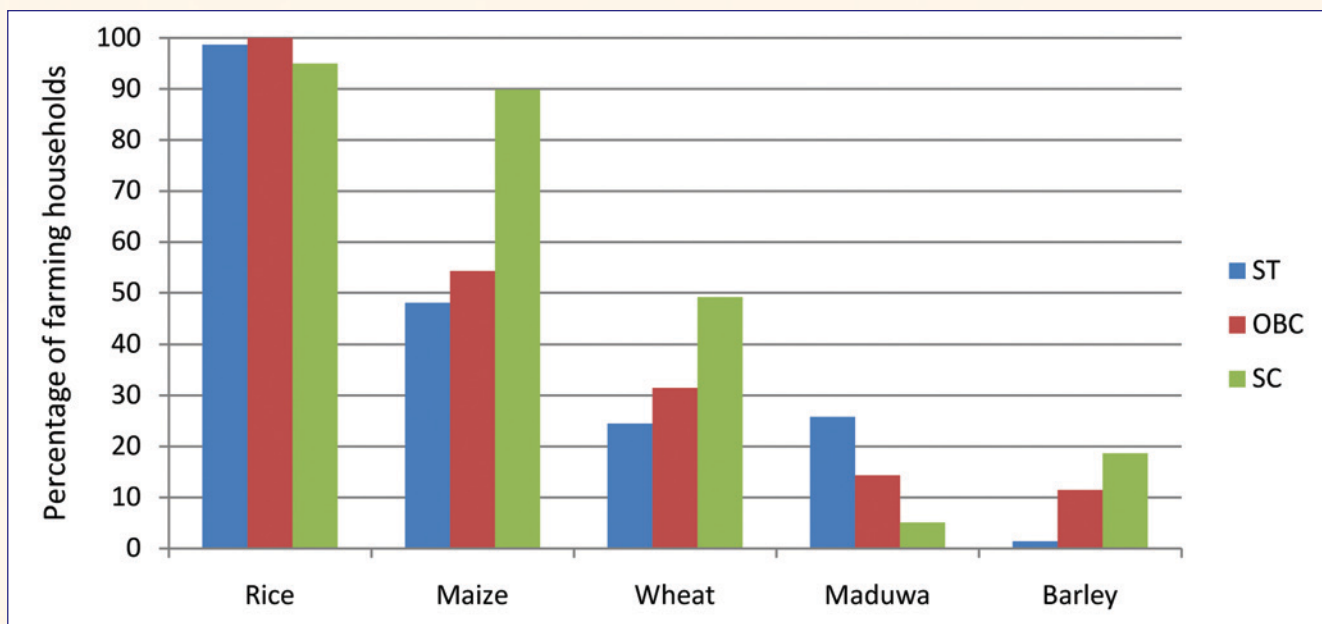


Chart 6.4: Percentage share of main cereals grown, by social category (ST, OBC, SC)



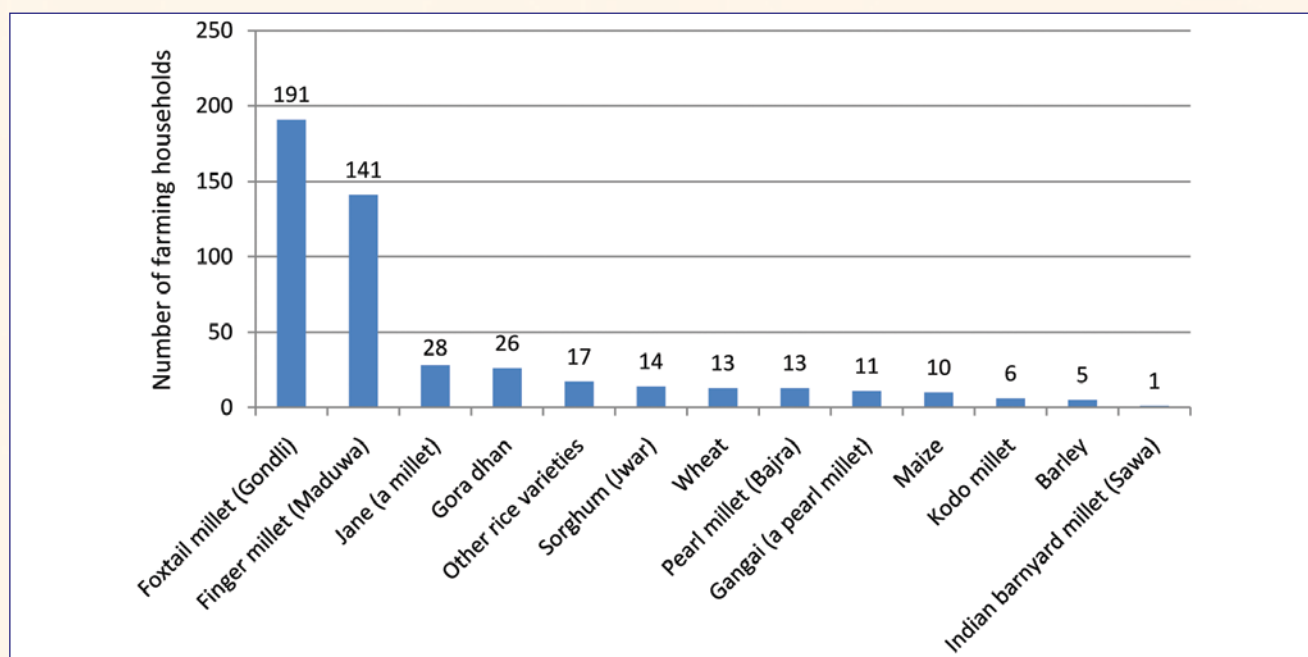
Overall, one-third (36 percent) of surveyed households feel production is better than it was ten years ago, whereas almost half (46 percent) said there is no difference and 11 percent said it is worse (another 7 percent gave no response). For better or worse, three-quarters of respondents (76 percent) attribute the changes in production to the introduction and use of hybrid seed and/or chemical fertiliser use.

Photo 6.1: Maduwa harvested in Angara block, Ranchi district



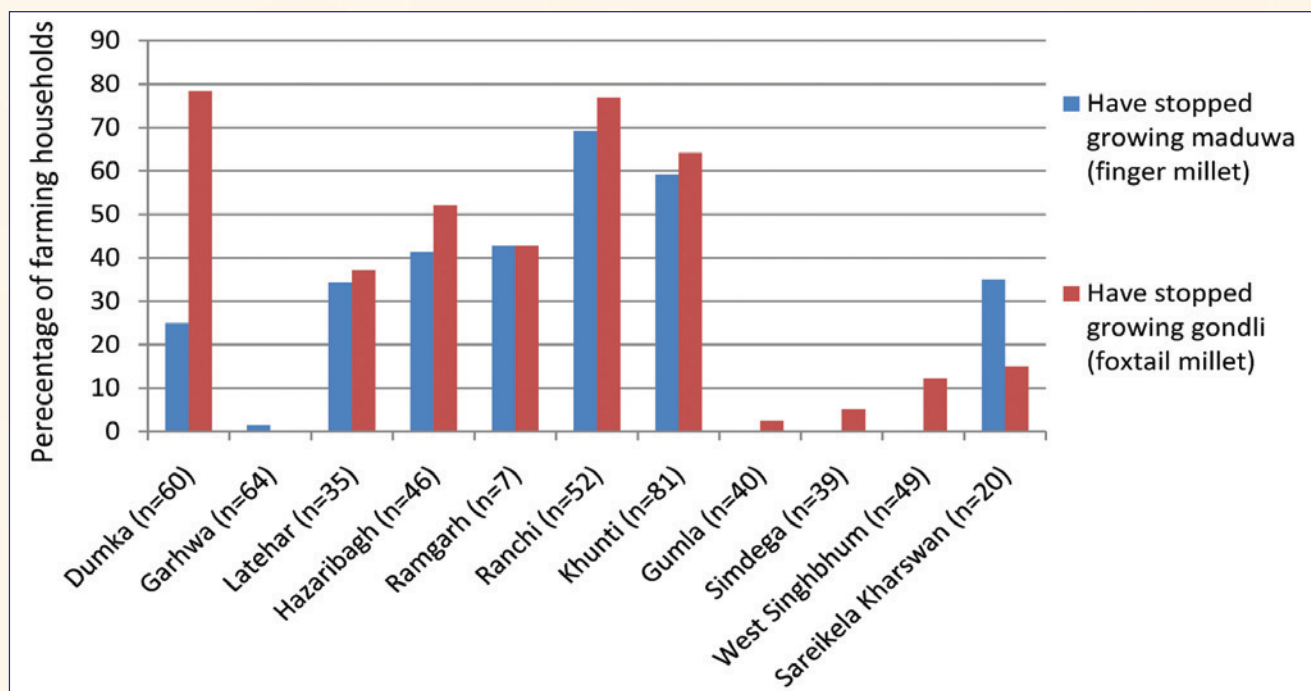
In recent years many farming households have stopped growing certain crops. Over two-thirds (70 percent) of households listed at least one crop that they have stopped growing in the past years. Chart 6.5 shows that 39 percent of households (191 respondents) said that they have stopped cultivating gondli (foxtail millet) in recent years, and 28 percent of households (140 farmers) have stopped cultivating maduwa (finger millet). For jane (a millet), and gora dhan (an upland, short duration rice), the number of farmers who've stopped cultivation total 28 and 26 respectively, some 6 and 5 percent of the respondents. It is likely that the figures for gora dhan and other rice varieties are under-estimations.

Chart 6.5: Number of farming households that have stopped sowing certain cereals



A closer examination of the sampled districts in which farmers have stopped cultivation of maduwa and gondli reveals that a large proportion of the households are located in Dumka, Ranchi and Khunti districts, followed by Hazaribagh, Saraikela Kharswan and Latehar (chart 6.6). One reason why farmers have stopped cultivating millets is less or untimely rains at the start of the monsoon, in the month of June. Another more likely reason is the cultivation of hybrid crops: 75 percent (106 farming households) of the 141 households who have stopped growing maduwa grow hybrid rice, as do 63 percent (120 farmers) of the 191 households who have shunned gondli. These averages (75 percent and 63 percent) are above the 52 percent of surveyed farming households that have grown hybrid rice. More research is needed to understand this phenomenon.

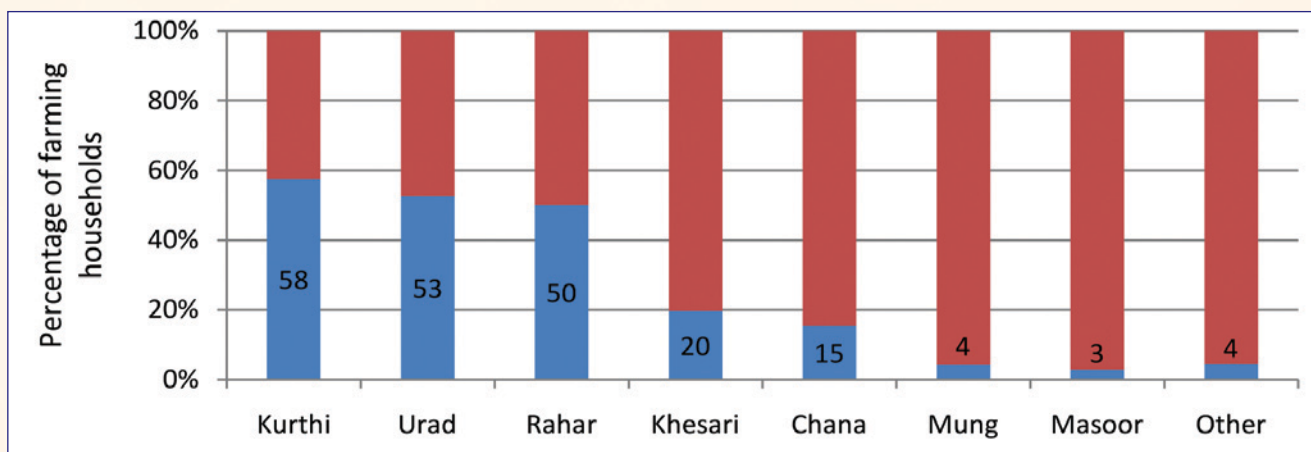
Chart 6.6: Proportion of households that no longer cultivate maduwa and gondli, by cluster



Pulses

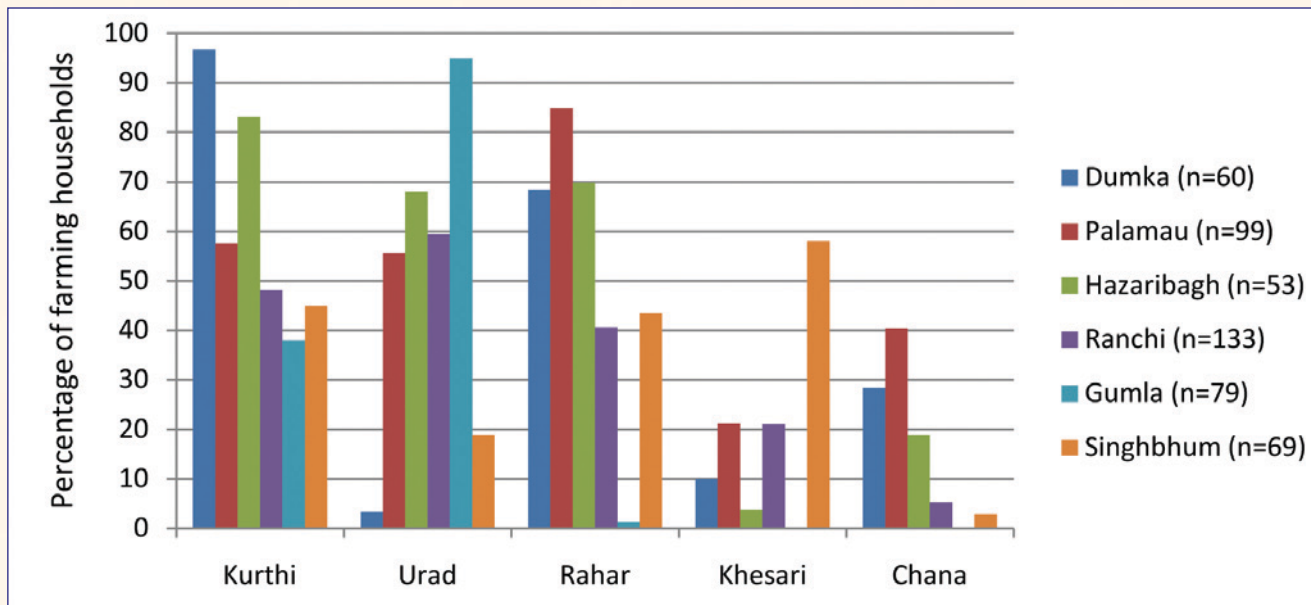
The most popular pulses grown by farmers, as seen in chart 6.7, include kurthi (58 percent of respondents), urad (53 percent), and rahar (50 percent). A small number of farmers said they'd stopped growing rahar (10 farmers) and masoor (8 farmers). Again, more research is needed here.

Chart 6.7: Percentage share of respondents (n=493) growing various pulses



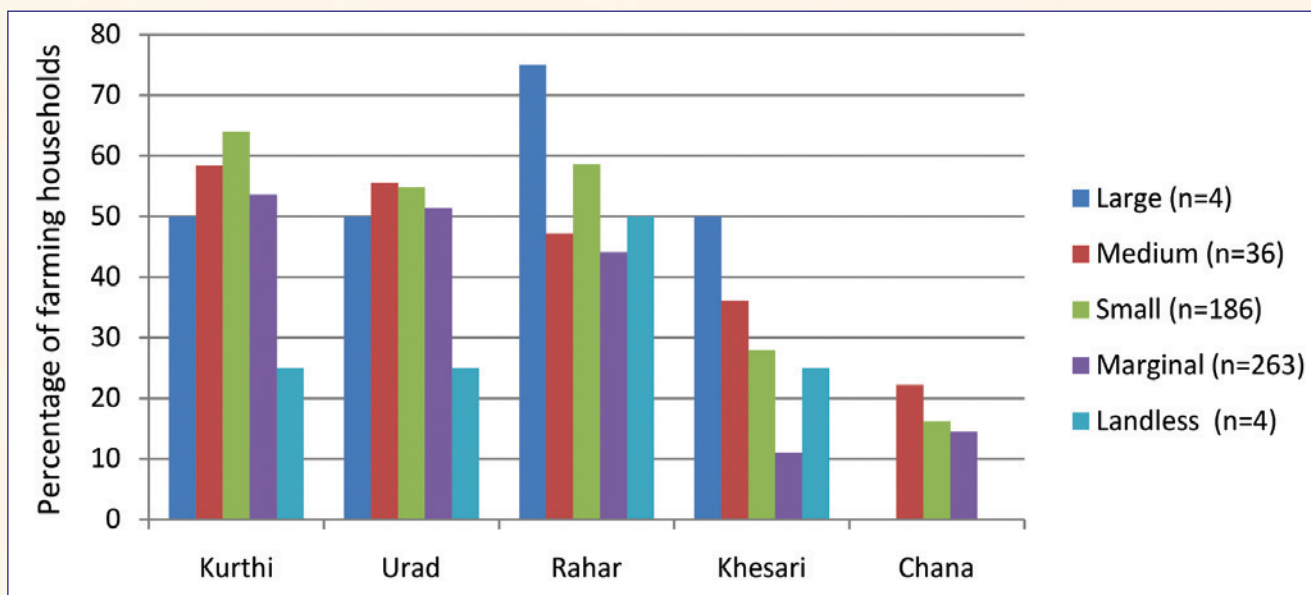
Kurthi (horse gram), the most popularly grown of pulses, is cultivated in all the six clusters, and is particularly popular in Dumka and Hazaribagh clusters (chart 6.8). Urad (black gram) is most popular in Gumla and Simdega, though little urad is grown in the surveyed villages of Dumka. Rahar (pigeon pea, or red gram) is grown widely, though not in Gumla cluster. Khesari (grass pea) is most grown in the Singhbhum cluster, and chana (chickpea) is most grown in the Palamau cluster.

Chart 6.8: Percentage share of main pulses grown, by cluster



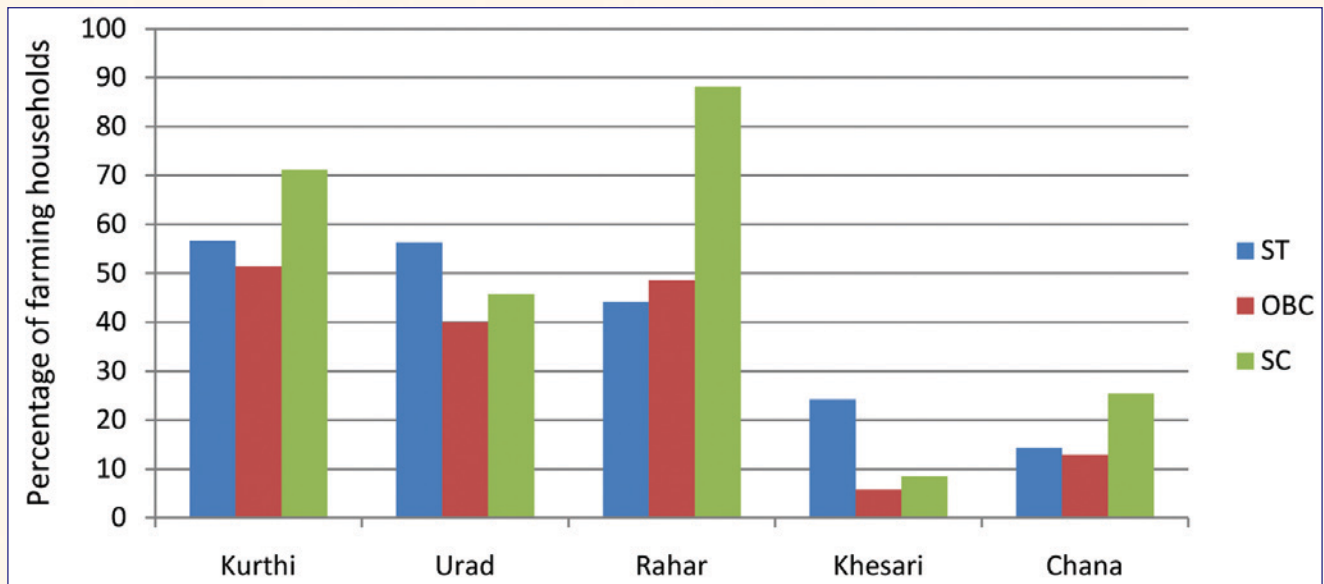
There is little variation by landholding size in the cultivation of pulses (chart 6.9). The share is roughly equal across marginal, small and medium categories.

Chart 6.9: Percentage share of main pulses grown, by landholding size



Likewise, a check by social category only highlights that a high proportion of the surveyed SC households prefer to grow rahar (reflecting that most of the sampled SC households reside in Palamau and Hazaribagh clusters), whereas a slightly higher proportion of ST households prefer khesari cultivation (chart 6.10).

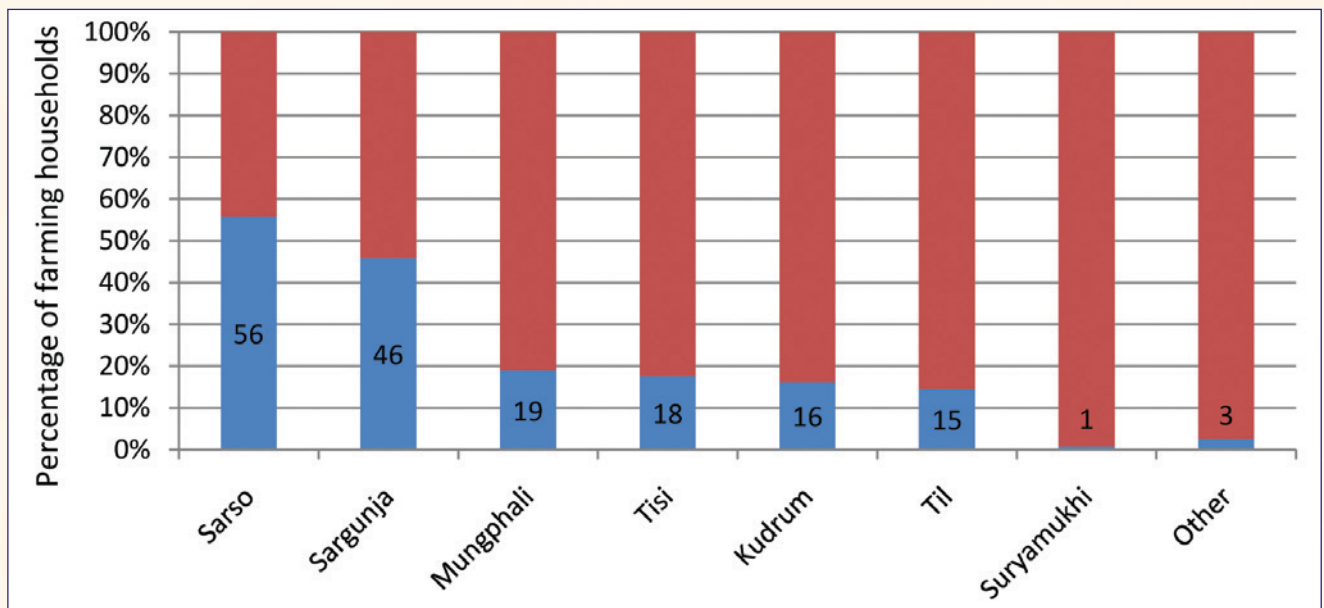
Chart 6.10: Percentage share of main pulses grown, by social category (ST, OBC, SC)



Oilseeds

The two most popular oilseeds grown by the surveyed households are sarso (mustard) (56 percent of farmers) and sargunja (niger) (46 percent). Next come mungphali (groundnut), tisi (flax), kudrum (kenaf) and til (sesame), each of which is grown by less than one-fifth of farmers (chart 6.11). A small number of farmers said they'd stopped growing til (sesame) and sargunja (niger seed); however this may be an underestimation.

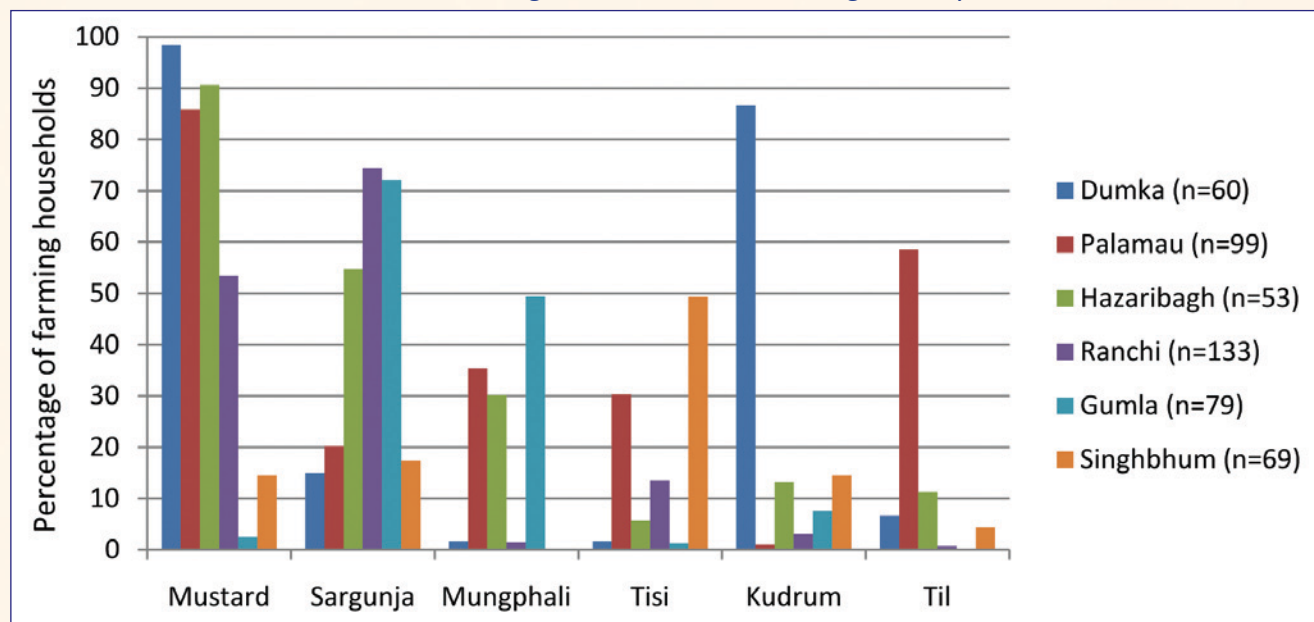
Chart 6.11: Percentage share of respondents (n=493) growing various oilseed



There is a marked variation in the cultivation of oilseeds across the state (chart 6.12). Mustard is grown in the northern parts of Jharkhand, by a majority of respondents in Dumka, Palamau and Hazaribagh clusters, and by over half of respondents in Ranchi and Khunti. Sargunja is most popular in Ranchi and Gumla clusters, grown by about three-quarters of households, and in Hazaribagh cluster where half of the respondents grow it. Mungphali is grown by half of the respondents in Gumla-Simdega, whereas tisi is

grown by half of respondents in the surveyed Singhbhum cluster. Kudrum is favoured in Dumka, and til in Garhwa-Latehar.

Chart 6.12: Percentage share of main oilseeds grown, by cluster



Little variation is detected when comparing across landholding size (chart 6.13). When checking the data by social category, we see that a higher proportion of surveyed SC farmers grow mustard and til as compared to OBC and ST categories (chart 6.14). Likewise, a larger number of surveyed ST and SC households grow sargunja compared to OBCs.

Chart 6.13: Percentage share of main oilseeds grown, by landholding size

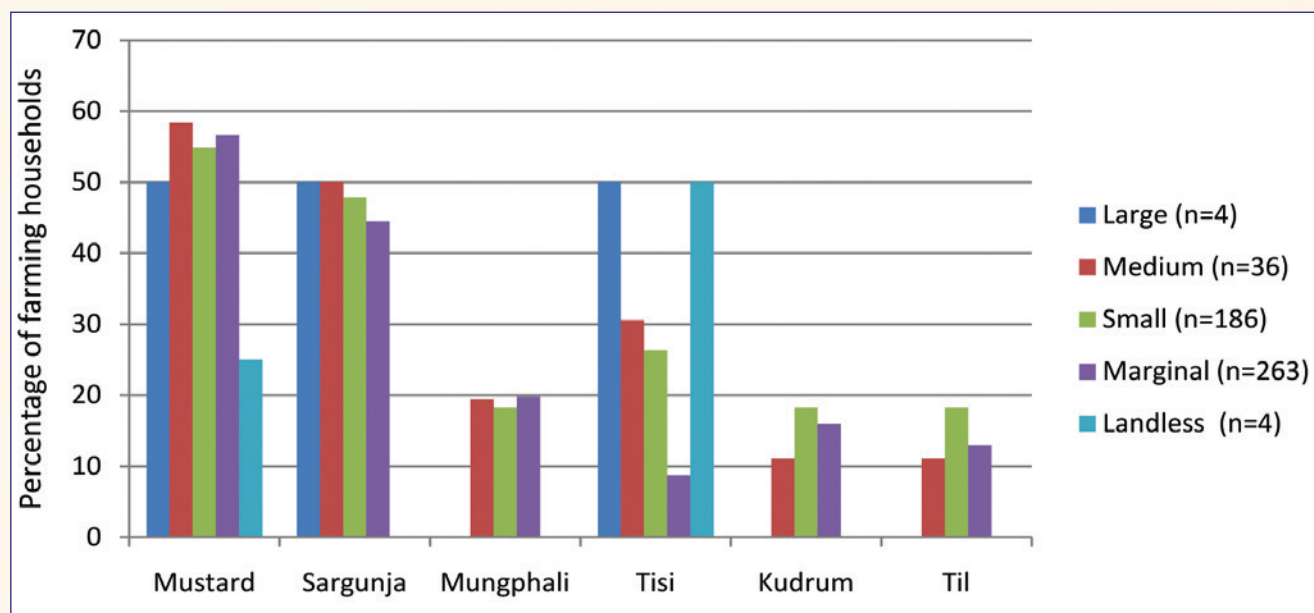
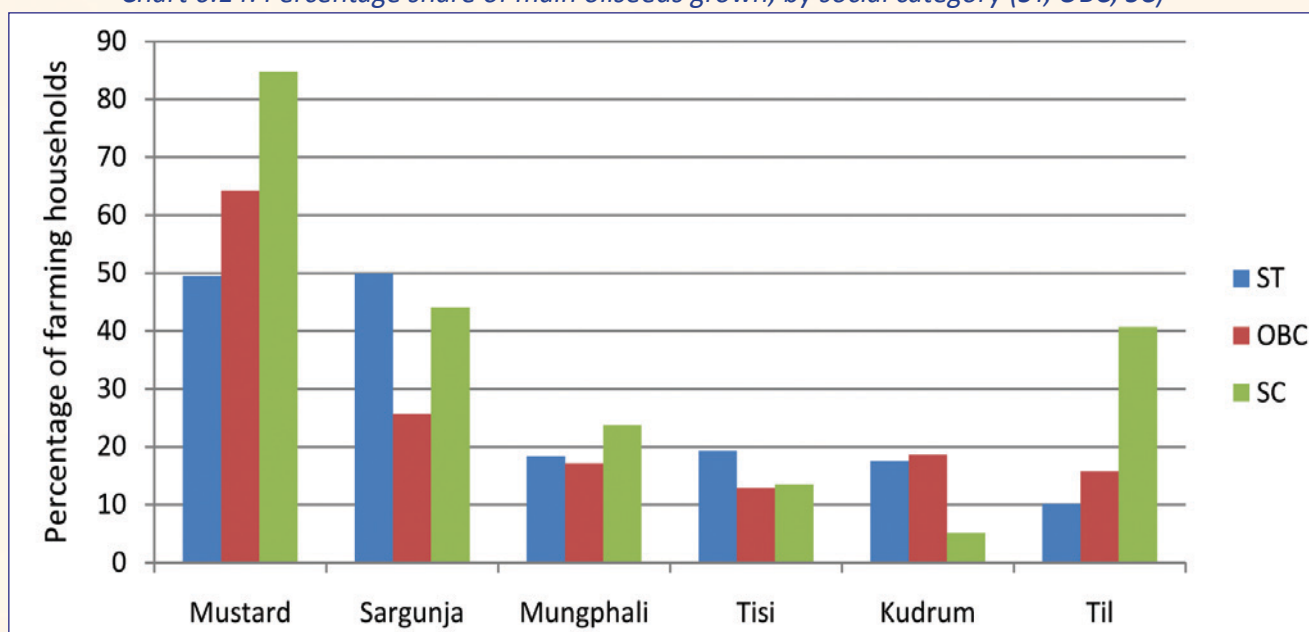


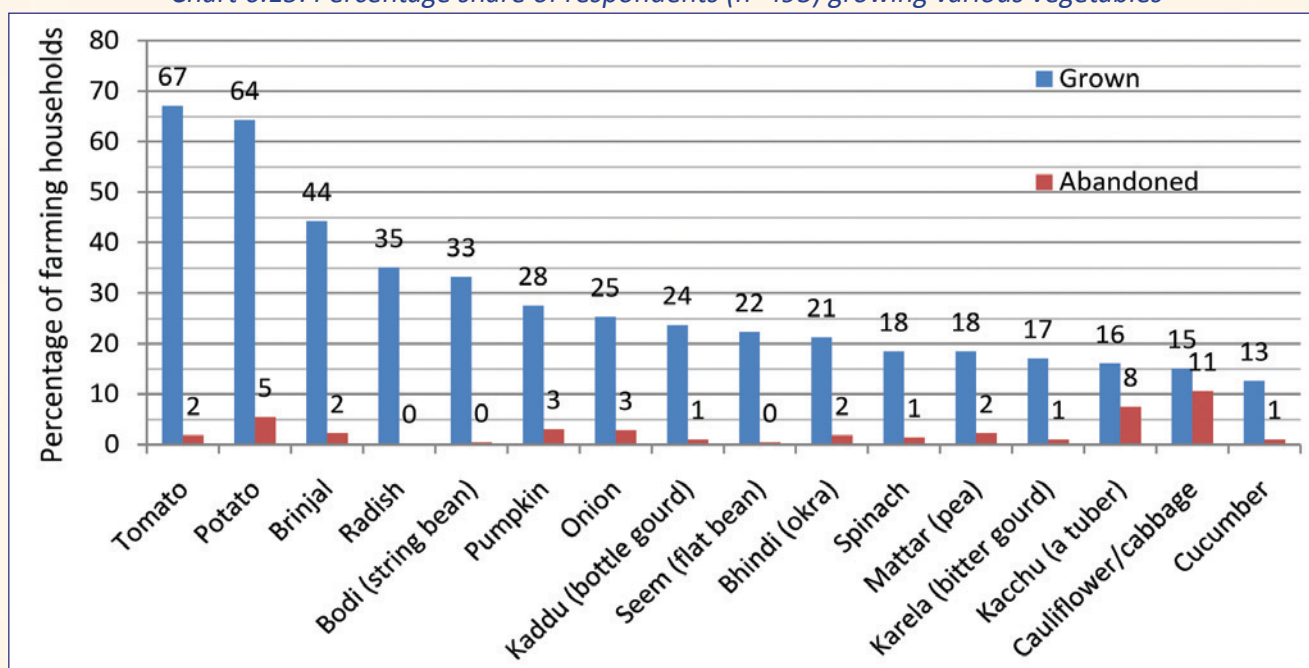
Chart 6.14: Percentage share of main oilseeds grown, by social category (ST, OBC, SC)



Vegetables

Vegetable cultivation, especially of non-local vegetables, has been popularised in recent decades due to the market introduction of hybrid seeds. 93 percent of the sampled farming households grow vegetables. 67 percent of respondents grow tomato, 64 percent potato, and 44 percent brinjal, whereas about one-third of respondents grow radish and bodi (long beans) (chart 6.15). The data on which vegetables are no longer grown is most definitely incomplete. However, 11 percent of households said they've stopped growing cauliflower and cabbage, and 8 percent said they no longer grow kacchu (a tuber). It can be noted that cauliflower and cabbage suffer from severe pest infestation, and farmers apply huge amounts of pesticides to these crops. That the pesticides are often non-approved for use on cauliflower/cabbage makes their consumption dangerous.

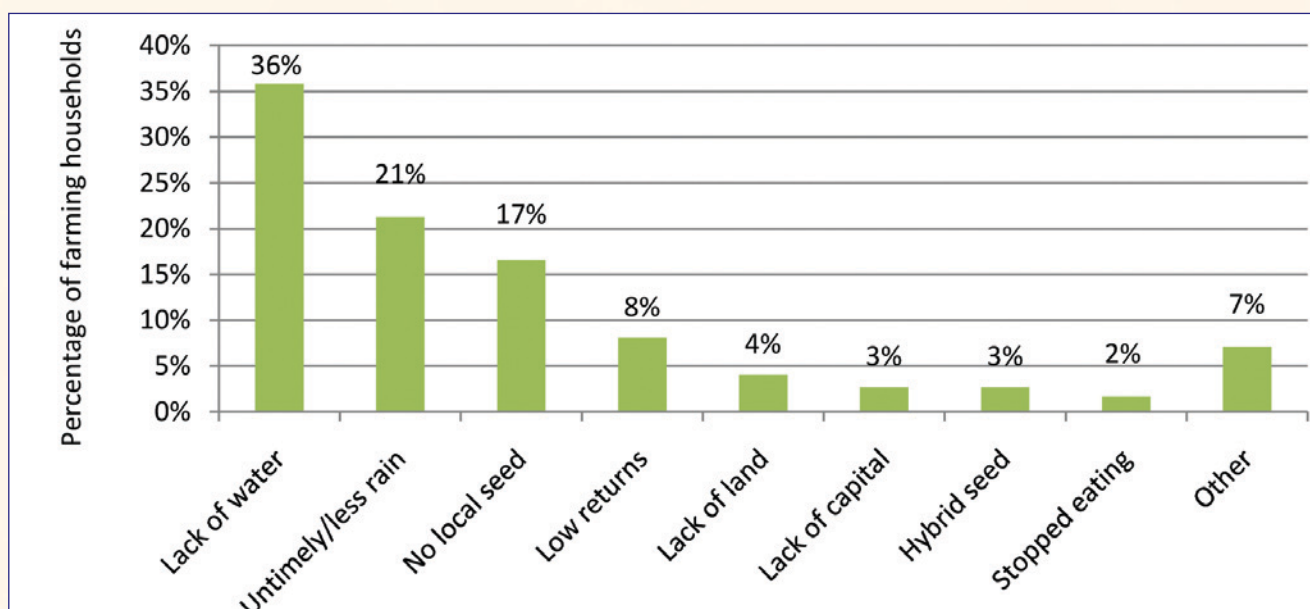
Chart 6.15: Percentage share of respondents (n=493) growing various vegetables



Possible reasons for the observed change in cropping patterns

In the above four sub-sections, it was mentioned that many of the respondents stated that they had given up cultivation of certain crops. For example, chart 6.5 shows that 39 percent of households have stopped cultivating gondli (foxtail millet) and 28 percent have stopped cultivating maduwa (finger millet). The question of why a household no longer grows any of the above mentioned crops (grains, pulses, oilseeds, vegetables) was answered by 296 respondents. The most frequent answer (36 percent of all responses) was lack of water/irrigation, and the second most frequent was untimely or less rainfall (21 percent of respondents). 17 percent of respondents cited lack of local seed, 8 percent cited low returns, 4 percent cited lack of land, and 3 percent cited lack of capital and another 3 percent put it down to hybrid seeds. Just 2 percent of respondents said that they'd stopped growing the crop because they no longer wanted to eat it (chart 6.16). Further research is needed on this topic. In particular, it is suspected that the promotion of input intensive hybrid crops (which do not include the millets maduwa and gondli) is a major factor for the shunning of millets, as is the non-inclusion of millets in the Public Distribution System (PDS).

Chart 6.16: Reason cited for giving up cultivation of any crops by respondents (n=296)



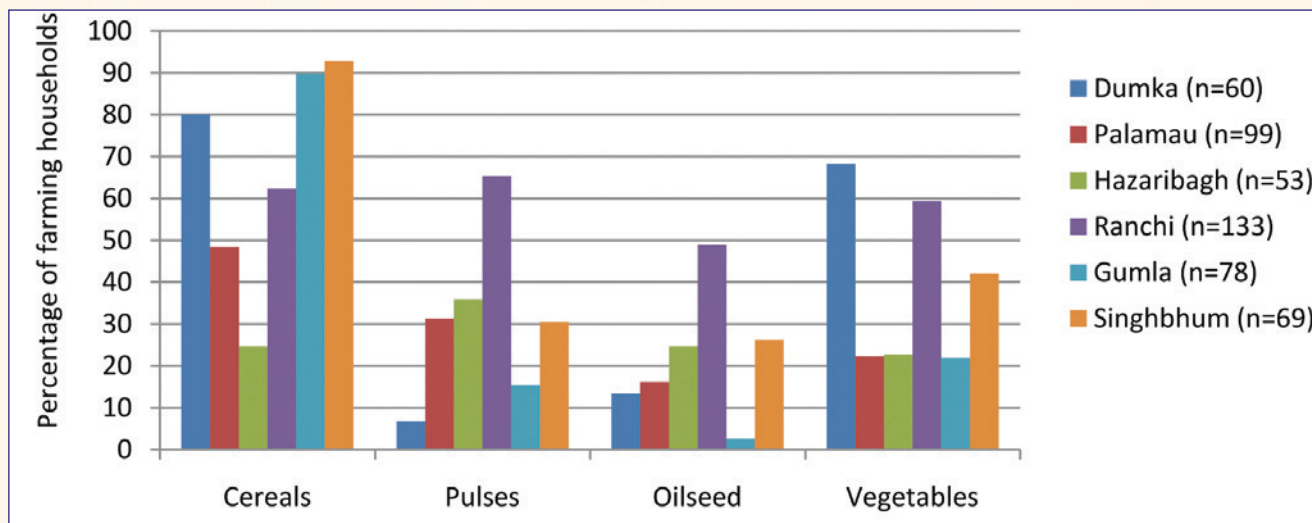
7. Seed

Access to local seeds

In recent years the introduction of F_1 hybrid seeds to the market by the private sector has caused a steep decline in availability of local seeds (landraces, also known as traditional or deshi varieties). The stated logic behind this, from the side of the government and private sector, has been to increase yields. Little to no attention has been paid by the government or private sector to ensure that local varieties are preserved in-situ; which has resulted in the extinction of 1000s of different crop varieties.

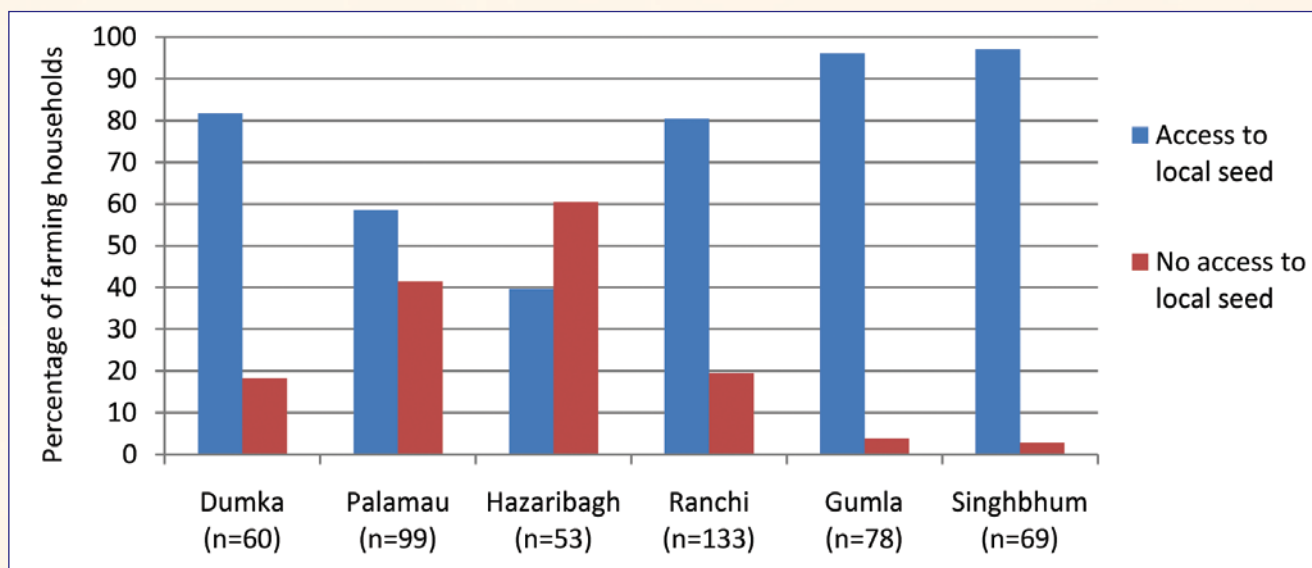
Two-thirds (66 percent) of households, concentrated in Dumka, Gumla and Singhbhum clusters, said they can access the seeds of local varieties of cereals. Only one-third of respondents (35 percent) said they had access to the seed of local pulse varieties, the majority coming under Ranchi cluster, with the least being in Dumka. Just 25 percent of respondents have access to local varieties of oilseed, the majority coming from Ranchi cluster. Two-fifths of households (41 percent) have access to some local seed of vegetables, the majority from Dumka and Ranchi clusters (chart 7.1).

Chart 7.1: Access to local seeds of cereals, pulses, oilseed, vegetables, by cluster



Our data shows that overall, three-quarters (76 percent) of the surveyed farming households still have access to some kind of local seed. Farmers of Gumla and Singhbhum clusters, and Dumka and Ranchi clusters, have better access to local seeds (chart 7.2).

Chart 7.2: Access to local seeds, by cluster

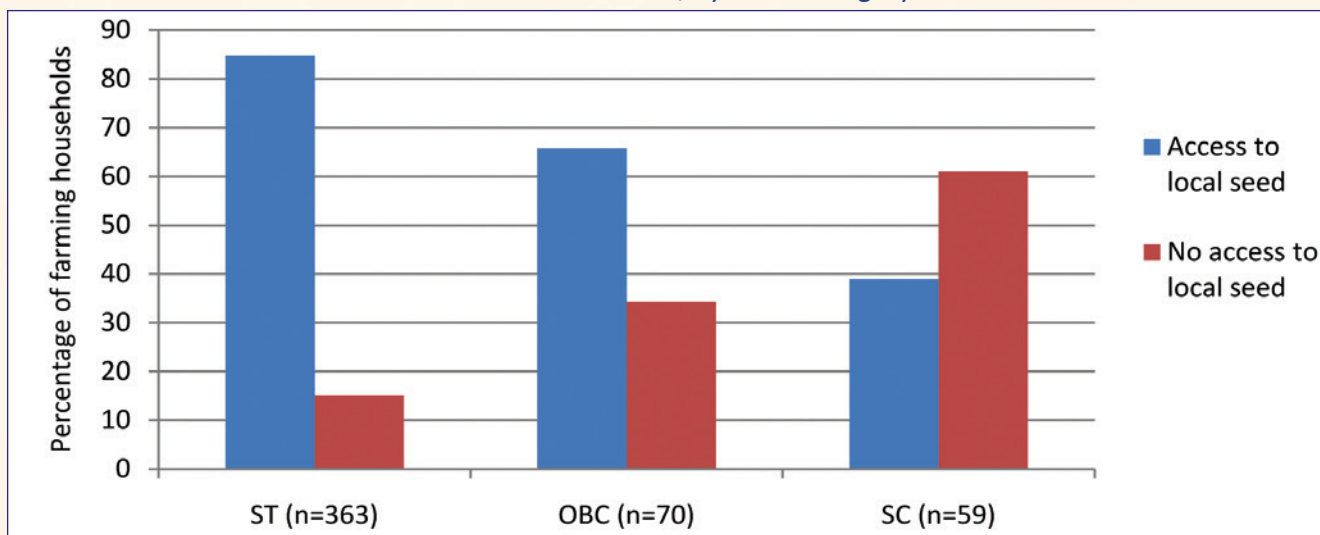


The data shows that a higher proportion of ST farmers, followed by OBC farmers, have access to local seeds as compared to SC farmers (chart 7.3). In fact, 61 percent of surveyed SC farmers have no access to local seed, as compared to just 15 percent of ST farmers.

Nevertheless, 86 percent of farmers (n=493) said a lack or shortage of local seeds worries them, for the following reasons:

- Cost of hybrid seed (58 percent)
- Loss of independence (36 percent)
- Lack of quality/taste of hybrids (28 percent)

Chart 7.3: Access to local seeds, by social category of farmer

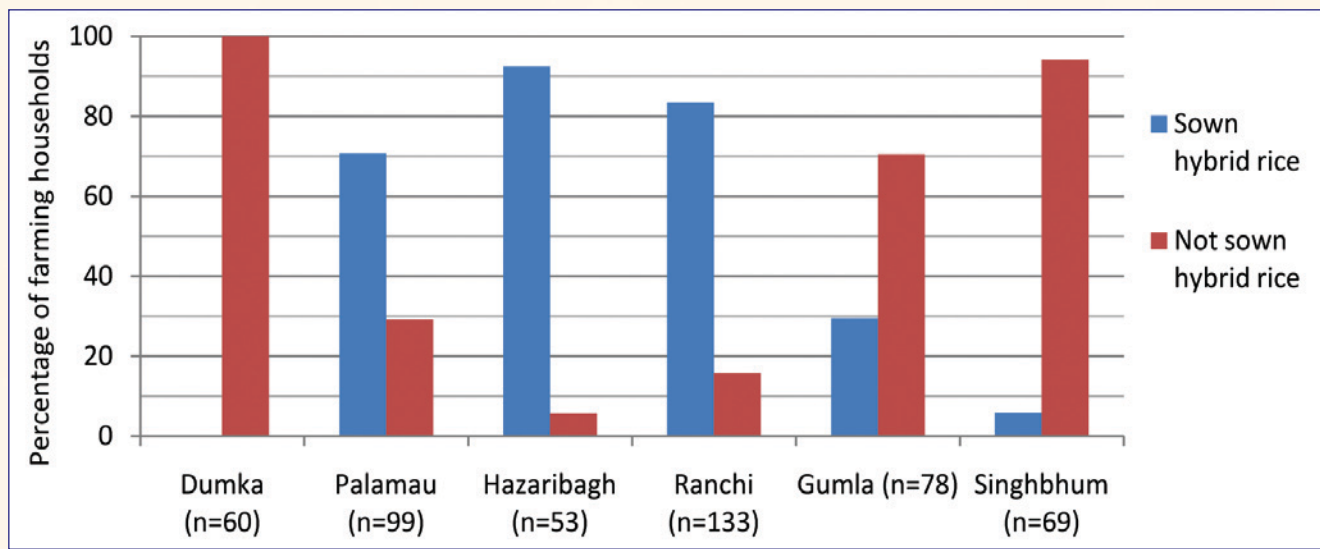


F₁ hybrid rice

F₁ hybrid seeds came on to the market in Jharkhand in the 1990s.⁹⁷ Nowadays most vegetable seed, especially those exotic to Jharkhand, are F₁ hybrid. In the rice sector, F₁ hybrid seeds have been popularised by the private sector through advertisements and sales gimmicks, like the giving away of buckets or umbrellas with rice packets. The companies selling F₁ hybrid seed set targets for the retailers, and if the retailers meet these sales targets, they may be treated to holidays. For example the Indian seed company JK Agri Genetics has sent retailers to Thailand and the multinational DuPont has offered retailers trips to Dubai.

Just half of the farming households interviewed (52 percent) have bought F₁ hybrid rice (n=490). The geographical distribution of F₁ hybrid rice uptake is important to note (chart 7.4). None of the surveyed farmers in Dumka, only a few (6 percent) of the farmers in Singhbhum cluster, and only one-third (29 percent) of Gumla's surveyed farmers have purchased F₁ hybrid rice. Its use is mainly found in Palamau, Hazaribagh

Chart 7.4: Geographical distribution of F₁ hybrid rice cultivation, by cluster

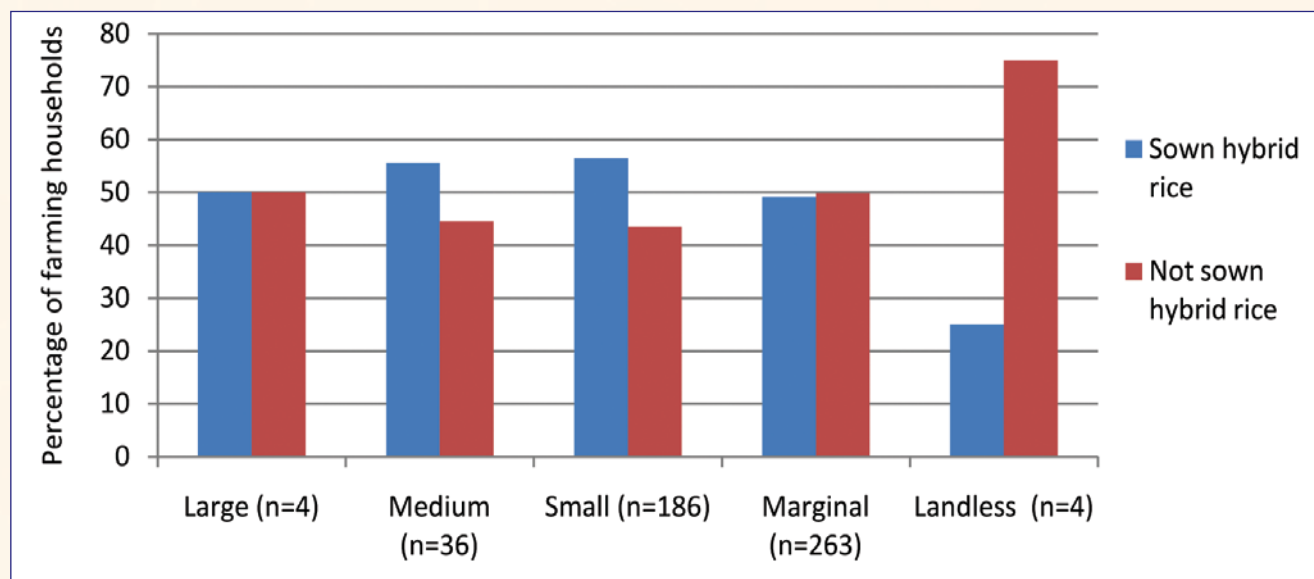


⁹⁷ Hill, J. K. W. (2015). F₁ hybrid rice in Eastern India: Silver bullet or capitalist ploy? *Capitalism Nature Socialism*, 26(3), 73-88.

and Ranchi clusters; where 81 percent of the surveyed farmers (n=283) grow hybrid rice. A closer look at the data shows that 100 percent of the interviewed farmers in Latehar district grow hybrid rice (n=35), whereas in Garhwa district just 55 percent of the surveyed farmers grow F_1 hybrid rice (n=64).

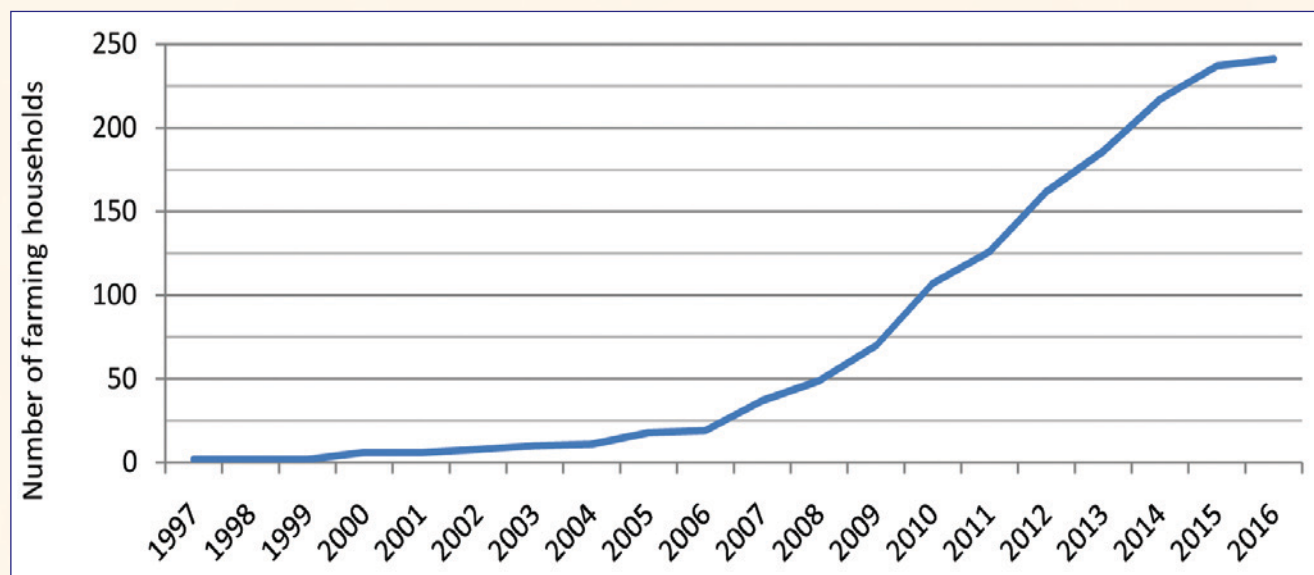
The analysis shows that over 50 percent of medium and small farmers sow F_1 hybrid rice, whereas roughly an equal number of marginal farmers sow and do not sow the product (chart 7.5).

Chart 7.5: Percentage of farmers sowing F_1 hybrid rice according to landholding size



The purchase and use of F_1 hybrid rice grew slowly from the late 1990s until about 2006-07, after which its uptake increased rapidly (n=241) (chart 7.6).

Chart 7.6: Year in which farmer first bought F_1 hybrid rice (cumulative tally of households)



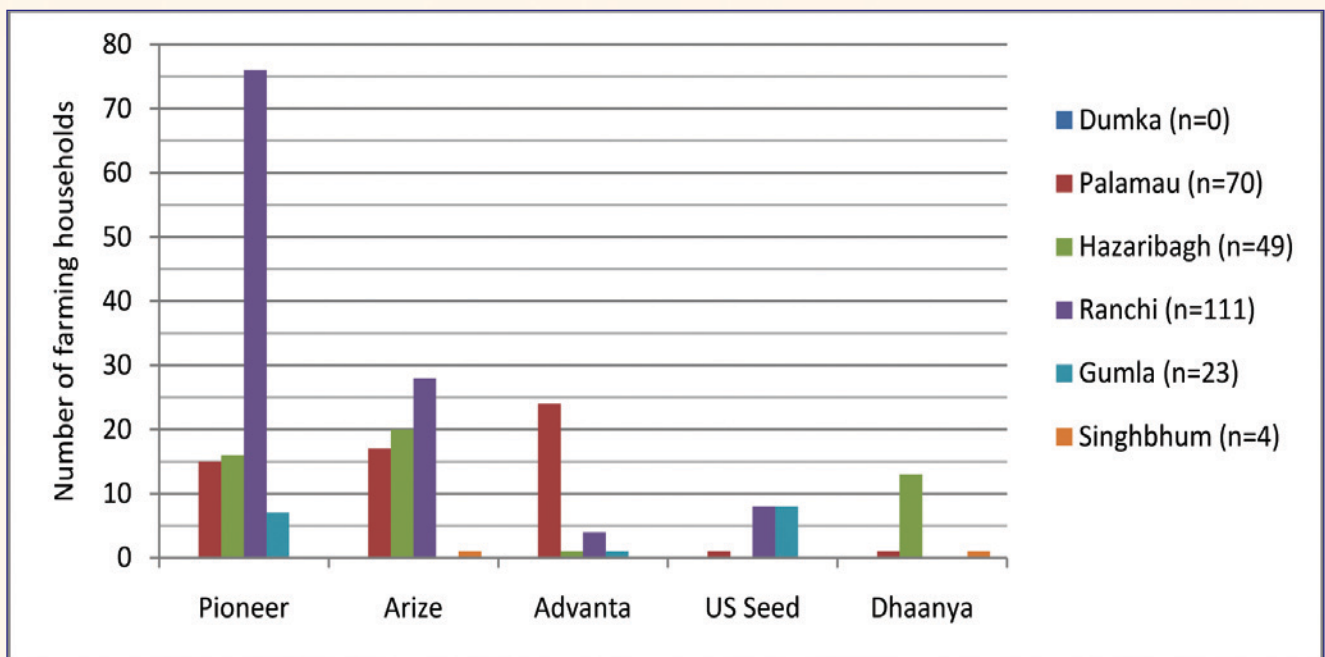
The interviewed farmers (n=257) named over 20 varieties of F_1 hybrid rice that they have bought. By far the most popular is Pioneer, owned by the US multinational DuPont, which 114 farmers (44 percent) have bought. 66 farmers (26 percent) have bought F_1 hybrid seed from Arize, owned by the German MNC Bayer; while another 62 farmers (25 percent) have bought either Advanta (owned by the Indian multinational UPL), US Seed (a US multinational), or Dhaanya (now owned by Tata). Chart 7.7 shows where these top five brands

Photo 7.1: A seed vendor's store in the early kharif season



of F_1 hybrid rice sell. Pioneer is a favourite in Ranchi, but sells elsewhere too. Arize sells best in the Ranchi, Hazaribagh and Palamau clusters, Advanta in Palamau cluster, US Seed in Ranchi and Gumla clusters, and Dhaanya in Hazaribagh cluster.

Chart 7.7: Where the five top-selling F_1 hybrid rice products are sold, by cluster



High Yielding Varieties (HYVs) of rice

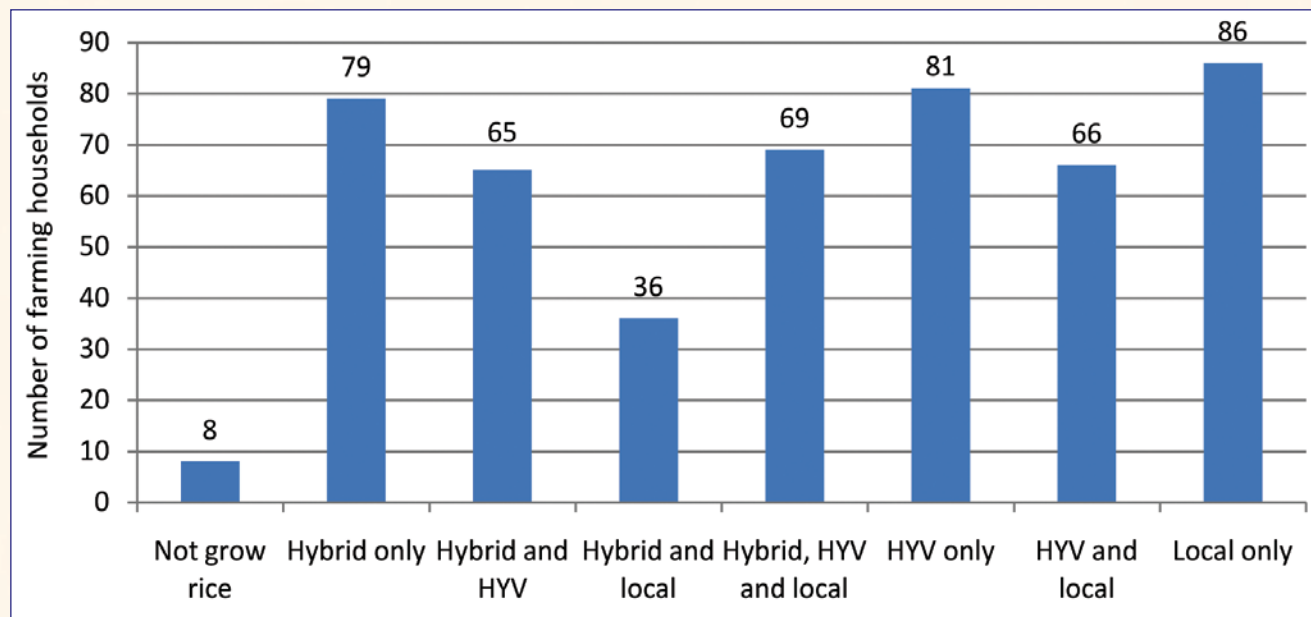
In 2002 the respected Indian agricultural economist Aldas Janaiah had pointed out that resources diverted from conventional rice improvement programmes and invested in hybrid rice research and development had been wasted, and recommended that “regular replacement of quality seeds of existing HYVs of rice ... can increase yields by 17–22 per cent without much extra investment”.⁹⁸ A consortium of civil society groups, GRAIN, in 2010 published a report that claims “rice seed programmes are increasingly focused on hybrids, and support for developing inbred [HYV] varieties or improvement of native land races [traditional seed] that are more resilient to different agro-climatic conditions, is disappearing”. It is not the performance of F_1 hybrid that is attractive to seed companies they claim, but rather “the fact that farmers cannot save the seeds from these varieties, thus guaranteeing the companies a captive market”.⁹⁹

Over two-thirds (69 percent) of the surveyed farmers (335 farmers, $n=489$) have grown a High Yielding Variety (HYV) of rice. These differ from F_1 hybrid, because they are mostly produced by the public sector, are cheaper in price, and the seed can be saved and sown again the following year. Lalat is the most popular HYV, grown by 56 percent of HYV farmers ($n=335$). In fact it became apparent during the survey that the acceptance of Lalat by farmers is such that most farmers consider it a local rice variety (a landrace). IR36 has been grown by 45 percent, IR64 by 39 percent, and Mansuri by 21 percent of HYV growing farmers ($n=335$). In some places farmers do not replace HYV seed rather they continue to use it, year after year; whereas in other districts the farmers replace the HYV seed every two or so years by purchasing again.

Rice cropping pattern (by rice type) in 2016 kharif season

Three types of rice are extant, namely F_1 hybrid, HYVs, and local varieties. Within each type there are numerous varieties. As stated, the F_1 hybrid are mainly produced by the private sector, the HYVs by the

Chart 7.8: Number of farming households growing different combinations of rice types



⁹⁸ Janaiah, A. (2002). Hybrid rice for Indian farmers. Myths and realities. *Economic and Political Weekly*, 37(42), 4319-4328. Quotation from p. 4326.

⁹⁹ GRAIN. (2010). Feeding the corporate coffers: Why hybrid rice continues to fail Asia's small farmers. GRAIN International: AGRA (Indonesia), BIOTHA (Thailand), BKF (Bangladesh), BRG (Papua New Guinea), GRAIN, KMP (Philippines), MASIPAG (Philippines), PANAP (Malaysia), SAEDA (Laos), SEARICE (Philippines), and UBINIG (Bangladesh). <http://www.grain.org/article/entries/4158-feeding-the-corporate-coffers-why-hybrid-rice-continues-tofail-asia-s-small-farmers>

public sector, while local varieties (traditional/landraces/deshi) are farmer-saved, having been bred and exchanged by farmers for centuries. The actual usage of these different rice types and varieties is complex to understand, because farmers often grow combinations on their different land parcels. Of the 490 surveyed farmers who grow rice, 86 farmers (18 percent) grew only local varieties, 17 percent grew only HYV varieties, and 16 percent grew only F₁ hybrid varieties in the 2016 kharif (chart 7.8). The remaining half of farming households (48 percent) grew combinations of the rice types. Overall, roughly half of the interviewed farmers (52 percent) grew traditional varieties, and 51 percent grew F₁ hybrid rice varieties in the 2016 kharif season.

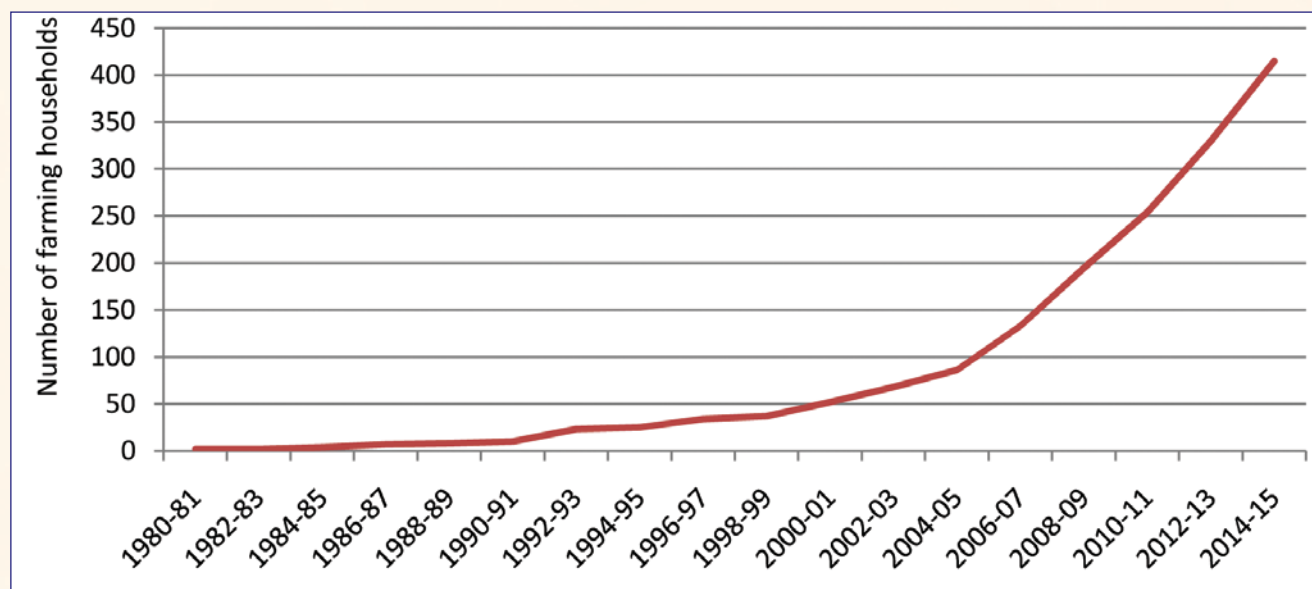
8. Chemical inputs: Artificial fertilisers and pesticides

The use of chemical fertilisers and chemical pesticides has grown rapidly in the past decade or so, due to the marketing of hybrid seeds by multinationals and smaller Indian companies, and promotion of chemical inputs by government agencies (including subsidies), some NGOs, and retailers. In India's earlier Green Revolution period, increase in fertiliser use in Jharkhand was insignificant as compared to elsewhere in the country. For example, while in undivided Ranchi district consumption of fertiliser rose from 1.2 to just 26.1 kg/ha net sown area between 1962/65 and 1990/93, in north-western India it rose from 4.3 to 163.6 kg/ha between 1962/65 and 1992/95, and in southern India from 8.3 to 115.3 kg/ha over the same period.¹⁰⁰

Fertiliser use

Our survey data shows that 92 percent of farmers (n=493) have used chemical fertiliser: 87 percent of farmers have used urea, 88 percent have used DAP, and 26 percent have used potash, and just a few have used ammonium (12 farmers) and phosphate (16 farmers). Chart 8.1 shows the trend of fertiliser use by surveyed farmers who answered the question, 'when did they first apply fertiliser?' (n=419). There is a steady increase up until 2004-05, and then a rapid increase in uptake thereafter.

Chart 8.1: Year in which farmer first applied chemical fertiliser (cumulative tally)

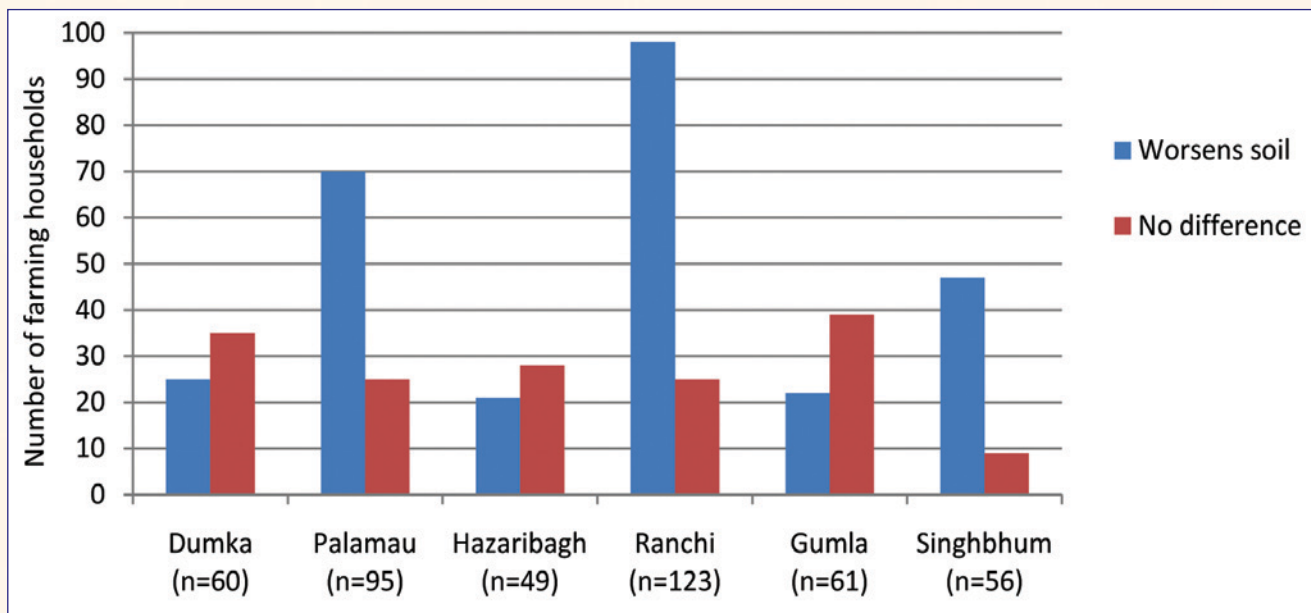


Three-quarters of respondents (74 percent) said that they increase the amount of chemical fertiliser they apply each year. Use of chemical fertiliser kills microorganisms in the soil and stops the natural cycles of the soil, e.g. nitrogen cycle; therefore once chemical inputs have been used, a farmer must continue to apply

¹⁰⁰ Bhalla, G.S., & Singh, G. (2001). Indian agriculture. Four decades of development. New Delhi: Sage.

the chemical fertilisers in greater amounts each year. Much of Jharkhand's farmland has a fragile, shallow soil, so fertiliser use easily damages the health of the soil. Two-thirds (64 percent) of farmers believe the use of chemical fertilisers has worsened the quality of their soil (a majority in Palamau, Ranchi and Singhbhum clusters), whereas the other one-third (36 percent) believe it to have made no difference.

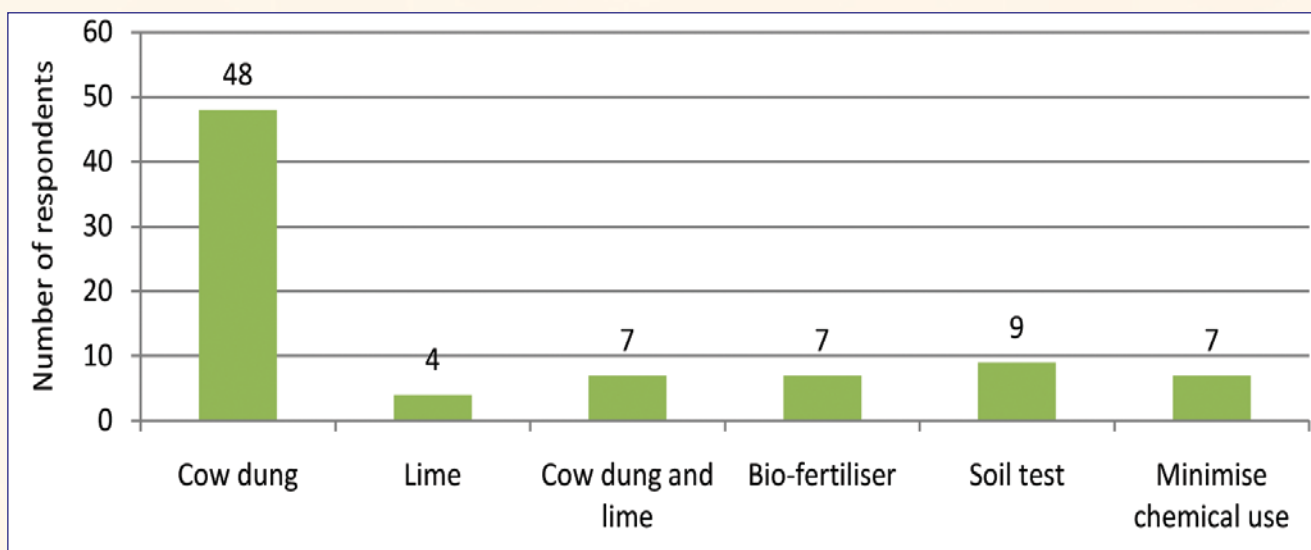
Chart 8.2: Whether application of chemical fertiliser is damaging the soil quality



The majority of farmers (86 percent) continue to apply cow dung as fertiliser alongside chemical inputs. 89 percent of farmer respondents have at least one pair of bullocks for ploughing: of these, 82 percent have one pair, and seven percent have two pairs. Of the 54 households without a pair of bullocks, 40 of these had a pair in the past. Of the cattle that belonged to these 40 households, 55 percent died of illness, and 25 percent were sold.

Highlighting the need for provision of support to farmers, the survey results show that less than one-fifth (18 percent) of respondents (n=451) have an idea about how to treat their soil once it has been damaged by chemical fertilisers; the majority resorting to use of cow dung alone (chart 8.3).

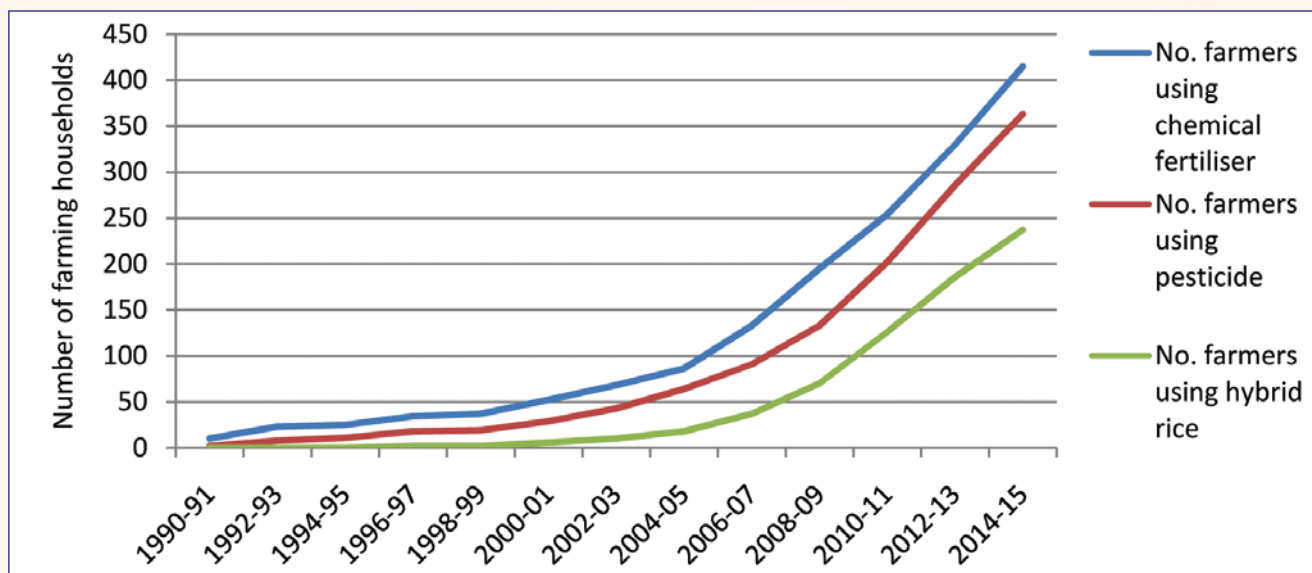
Chart 8.3: Response to question of how to treat damaged (over-fertilised) soil



Pesticide use

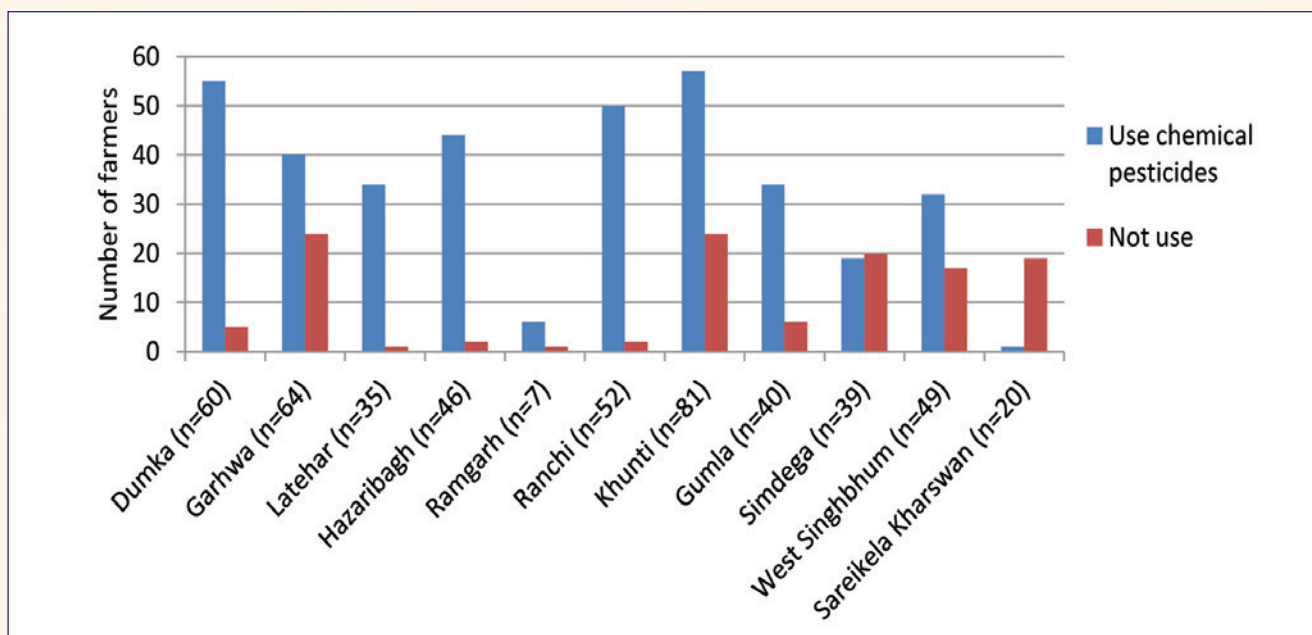
Three-quarters of the surveyed farming households (75 percent) use chemical pesticides on their crops. Usage of chemical pesticides has steadily grown since the early 1990s. Its increased uptake in recent years follows the trend of using chemical fertilisers and hybrid seeds. In chart 8.4 the trends of application of chemical fertiliser and chemical pesticide are given alongside that of F_1 hybrid rice, showing a marked increase since 2006-07.

Chart 8.4: Year in which chemical fertiliser, pesticide, and hybrid rice were first used



The use of pesticides is not uniform across Jharkhand. Analysis at the district (not cluster) level reveals that of our sampled households, those not using pesticides are concentrated in the districts of Garhwa, Khunti, Simdega, West Singhbhum and Saraikela Kharswan (chart 8.5). Analysis by social category shows that 72 percent of ST farmers use pesticide ($n=364$), as compared to 87 and 85 percent of OBC ($n=70$) and SC ($n=59$) farmers respectively.

Chart 8.5: District-wise use of chemical pesticides by sampled farmers



At a superficial level, farmers are under no illusion as to the danger posed by pesticides. 96 percent of farmers (n=493) consider pesticides harmful, with 90 percent stating they are damaging to human health, 60 percent to wildlife, 50 percent to air and water, 44 percent for soil, and 19 percent believing they affect other plants (chart 8.6). Nevertheless, farmers do not use protective clothing when applying the pesticides to their crops. It is a common sight to see farmers barefoot, in shorts and T-shirt, with no gloves or face mask, in their fields spraying their crops (photo 8.1).

Chart 8.6: Perception of dangers of pesticides

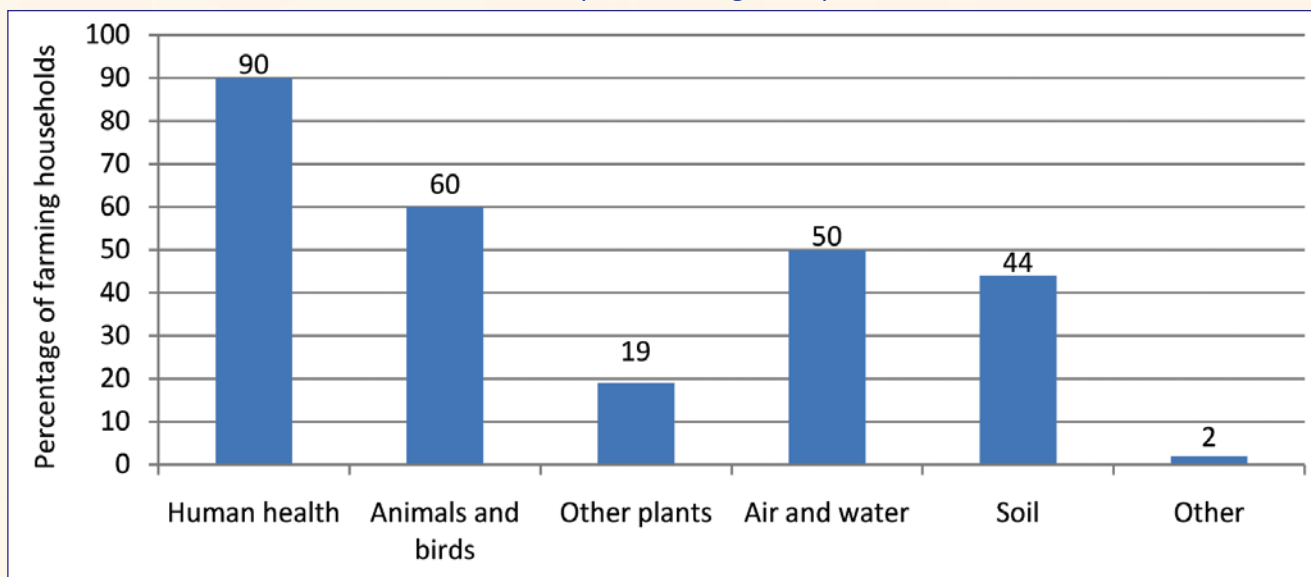


Photo 8.1: Farmer applying pesticide without protective clothing in Bero block, Ranchi district



Pesticide misuse in Jharkhand is rampant and out of control. For example, pesticides approved for use only on cotton (e.g. Chlorpyrifos 16% + Alphacypermethrin 1%), or for use only on cotton, safflower and paddy (e.g. Acephate 75% SP), with a waiting period of 15 days, are being sold by retailers to be applied to any crop including vegetables. These insecticides are often applied by farmers on a weekly basis, and in many cases are harvested and taken to the market a day or two after spraying, which is illegal and dangerous. In the vegetable belt to the west of Ranchi (Bero, Itki, Mandar etc.) herbicides are nowadays widely used to kill grass before preparation of the land for cultivation, or to kill grass when the sown crop is in the seedling stage or about to sprout. Glyphosate is one of the common herbicides used, which is approved for use only in tea gardens and on non-crop areas. Insecticides, herbicides and fungicides are sold openly by wholesalers at the Kutcheri and Pandra in Ranchi, and by retailers across the state. The government is also distributing pesticides to farmers from its block offices; without properly informing farmers of the approved uses of the products. This means that the farmers inevitably spray the chemicals on all kinds of crops.

Just 68 farmers (n=493), or 14 percent of farmers, said they use traditional pesticides, including cow urine, and leaves of neem, karanj, padasi, gargli, kewra, and pasu. On the one hand, this indicates that traditional knowledge of pest management is being replaced by use of chemical pesticides; and on the other hand, it shows that training is required for farmers to learn how to use traditional and novel methods to control pests, e.g. multi-cropping. The Mahila Kisan Sashaktikaran Pariyojana (MKSP) programme of the government, implemented by NGOs, provides training to farmers in this regard.

9. Water for agriculture

Changing weather patterns

89 percent of respondents (n=485) stated that they believe the weather has changed in the past ten years. 98 percent of farmers (n=487) felt the kharif rains are not timely as they were in the past. This is important, because the majority of Jharkhand's farmland is not irrigated, and farmers rely on the rhythm of the monsoon rains in order to prepare their fields and plant seed on time. More specifically, 299 farmers felt there is less rainfall nowadays alongside untimely rains, and 84 farmers felt that there is more heavy rain alongside untimely rains. 96 percent of respondents (n=475) felt the rabi (winter) season rains are less reliable as they were in the past. 92 percent felt it is hotter now, as compared to before, and 90 percent of these same farmers felt that the increase in temperature affects agriculture negatively. 22 percent of respondents felt there are more hailstorms as compared to the past.

Our intention was to understand how the weather is affecting farming. 85 percent of respondents (420 farmers) said their crops have been damaged by weather/drought in the past. 383 households estimated their loss in financial terms, giving an average loss of 22,700 rupees (median loss of 16,000 rupees). The minimum stated was 500 rupees and the maximum 2 lakh rupees. Only 12 households said they were compensated for their losses by the government. Just 28 percent of farmers (n=493) said that they had crop insurance (see next section).

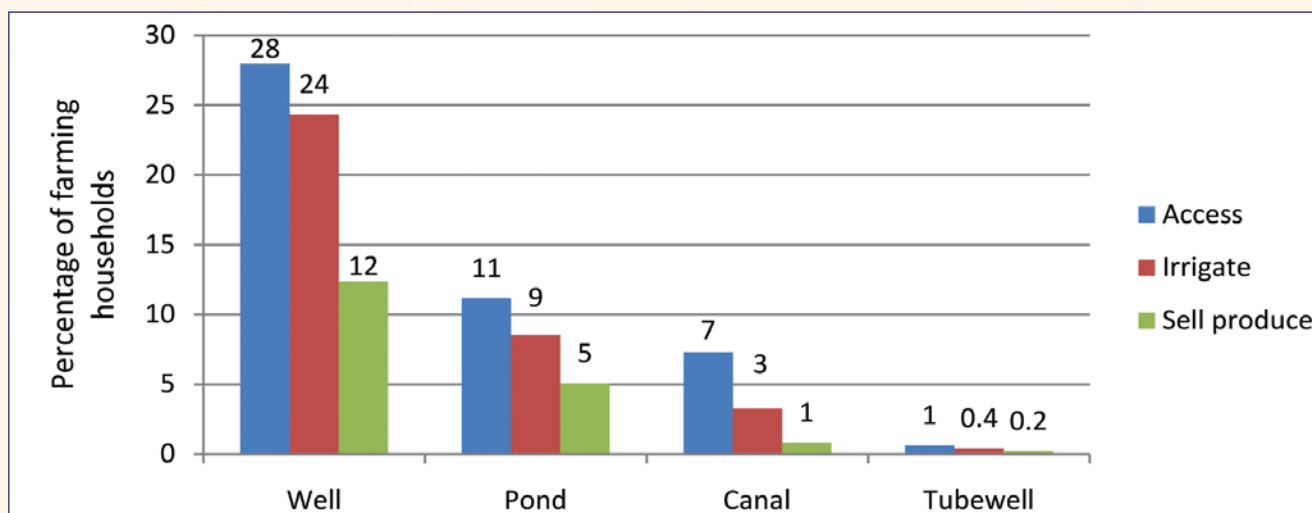
Under conditions of climate uncertainty, provision of assured irrigation is necessary for agricultural development. Jharkhand has historically been neglected in respect to creation of irrigation facilities, and this remains the case for the most sought after forms of irrigation: small and medium sized projects that utilise surface water. We have already seen that about one-third (36 percent) of respondents cite lack of irrigation/water as a reason for stopping cultivation of certain crops (chart 6.16). So what exactly is the extent of irrigation cover for our sampled farming families?

Irrigation

Our survey data shows that 182 of 493 farming households (37 percent) have access to irrigation water. 28 percent (138 households) of the surveyed households own or have access to a well, which is the most common irrigation facility. 55 of our sample farmers (11 percent) own or have access to a pond, and 7 percent have access to canal water (chart 9.1). Though the percentage of households having access to irrigation water seems fairly high (i.e. 37 percent), it is important to keep in mind that water from agricultural wells and ponds can irrigate only a limited area of farmland; which means that the majority of land is rainfed, reliant on the vagaries of the monsoon.

Of the 138 farmers having access to well water, 78 percent said the well was constructed by the government, and 10 percent by individuals. Of these, 120 farmers use the water for irrigating crops, half of whom (61 farmers) sell some of their irrigated crops (chart 9.1); thus the other half irrigate for subsistence production. 102 of the 138 farmers with wells use a pumpset to bring water to their plot, 45 percent using kerosene, 15 percent using diesel, 11 percent using electric and the remaining 29 percent using a combination of energy sources (photo 9.1).

Chart 9.1: Access to irrigation, use for irrigation, and sale of produce, by source of irrigation



Ponds and bandhs (talabs) are the second most popularly used sources of irrigation. Talabs and bandhs were once well managed by the community, but nowadays many of the water harvesting structures are dilapidated. 55 of the sampled farmers (11 percent) own or have access to a pond, 42 of which use the pond to irrigate, with 25 selling some of the produce. As with the wells, pumpsets powered by electric, diesel or kerosene, or a combination, are used to bring water to the farmplot. 33 of 55 households said the government had funded the pond construction, whereas 13 said that they themselves had built the pond.

Another 7 percent of the surveyed farmers have access to canal water. These 36 households reside in Jamni and Nayadih villages in Dumka, Kalyanpur village in Garhwa, and Tapkara gram panchayat in Gumla. Of these 36 households, just 16 use the water for irrigating crops, and only 4 households sell some of the produce.

Just 3 farmers (1 percent of the total households interviewed) stated they use a tubewell to irrigate; one each in Khunti, Dumka and Garhwa districts. In recent years there has been a surge in the sinking of tubewells, as seen in the villages of Bero block, Ranchi district. Tubewells are not an advisable option for irrigation development across much of Jharkhand due to the underlying rock, which stores water only in cracks (Personal communication, Dr Nitish Priyadarshi). Padma Shree Simon Oraon has repeatedly called for tubewells to be banned in Jharkhand.¹⁰¹

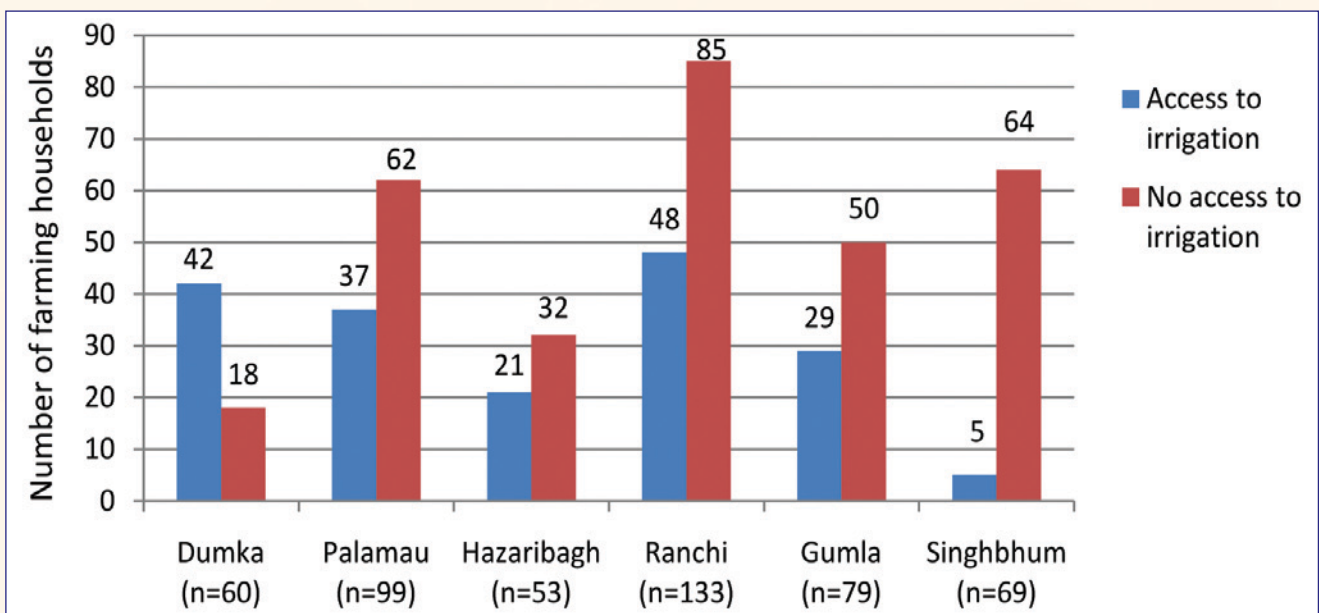
¹⁰¹ TNN (2016, April 16). 'We must ban deep borewells immediately'. The Times of India. Retrieved from <http://timesofindia.indiatimes.com/city/ranchi/We-must-ban-deep-borewells-immediately/articleshow/51858188.cms>

Photo 9.1: A well with electric powered pumpset for irrigation purposes



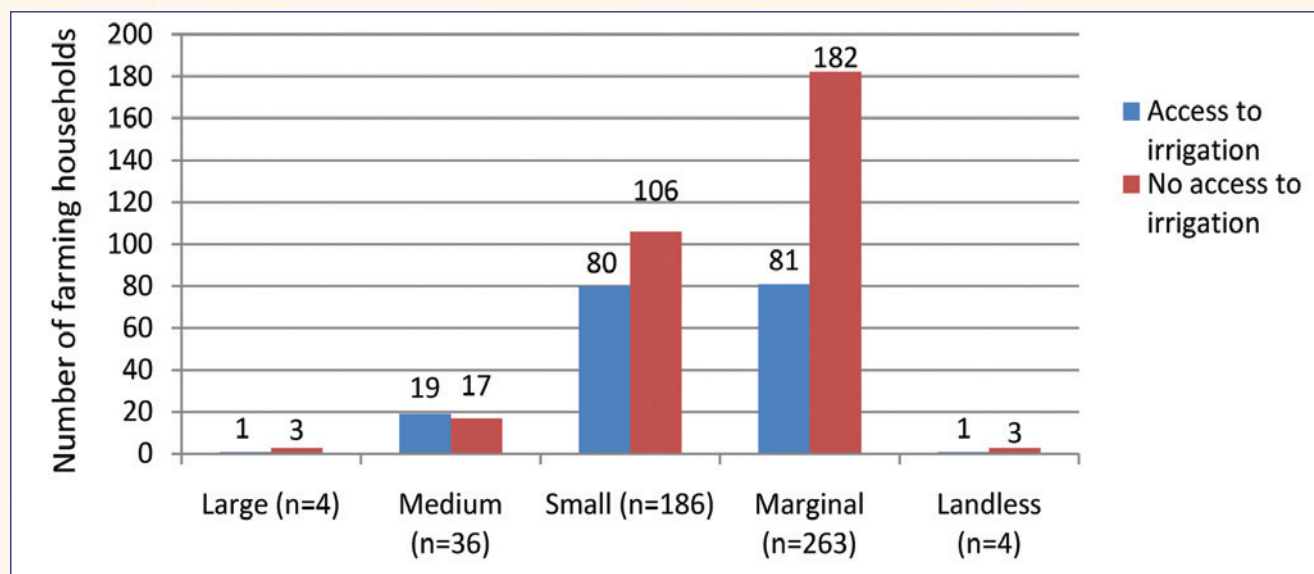
The distribution of irrigation facilities across Jharkhand, according to our sample, can be seen in chart 9.2; though we must keep in mind that generalisations from the small sample of 493 farmers in 30 villages cannot be taken too far. Only in Dumka (n=60) do a majority of the surveyed farmers have access to irrigation water. West Singhbhum and Saraikela Kharswan have the least number of farmers with access to irrigation (n=69).

Chart 9.2: Number of farming households with access to irrigation, by cluster



Access to irrigation facilities appears to be tied to farm size. This is because a household with larger landholdings can put aside land for an irrigation system (well, pond etc.) and is generally more able to pay the costs. In the case of government projects, larger landholdings are a proxy for greater resources and mobility, which allow such households to travel back and forth from government offices to avail funds. Chart 9.3 shows that over half (53 percent) of medium size farmers, 43 percent of small farmers, and less than one-third (31 percent) of marginal farmers have access to irrigation water.

Chart 9.3: Number of farming households with access to irrigation, by farm size



10. Financing agriculture and government support to farmers

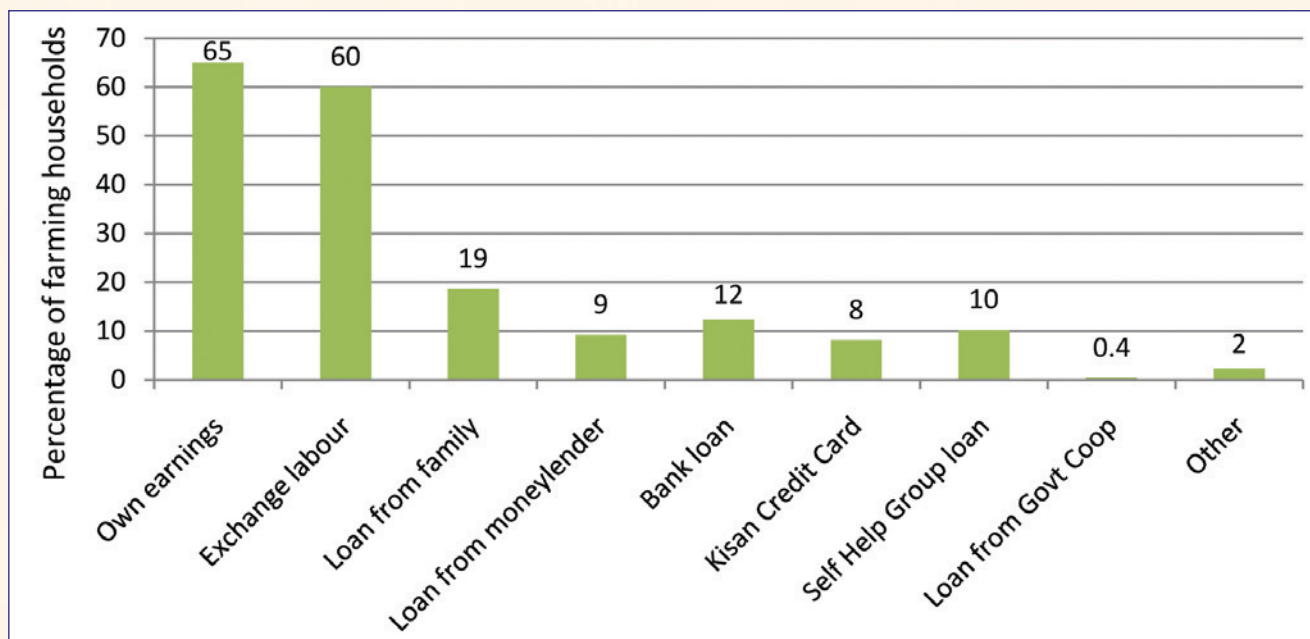
92 percent of households (n=487) were found to have at least one bank account, while 8 percent disclosed that they did not have a bank account. In 53 percent of the same sampled households the respondents stated that both had bank accounts, i.e. that their household had at least two bank accounts. Furthermore, just 17 of 877 respondents (2 percent) reported that they did not have an Aadhaar card, and only in four households of the 493 interviewed did neither respondent have an Aadhaar card at the time of the survey.

Loans

The question of loans to farmers has come to the fore due to increasing reports of farmer suicides. Four of the five Jharkhandi farmers mentioned in section 1, who took their lives in June and July 2017, had outstanding loans through a Kisan Credit Card and/or bank. This study, which took place in February and March 2017, found that seven of the 493 farming households, when asked, said they knew of a farmer who had committed suicide due to stress from farming. Of these seven suicides, three were said to be due to inability to repay a loan with interest, and three because of drought conditions and failure of crops.

The survey asked farmers how they fund their crop production activities. Of 476 farmers, 65 percent (311 farmers) stated that they use their own earnings, and 60 percent engage in exchange labour (chart 10.1). The remaining responses relate to loans: 19 percent (89 households) have taken a loan from their family, 9 percent (44 households) from money lenders, 12 percent (59 households) from a bank, 8 percent (39 households) from the Kisan Credit Card (KCC) scheme, 10 percent (49 households) from Self Help Groups (or mahila samitis), while just two (0.4 percent) of the surveyed households have taken loans from government cooperative societies.

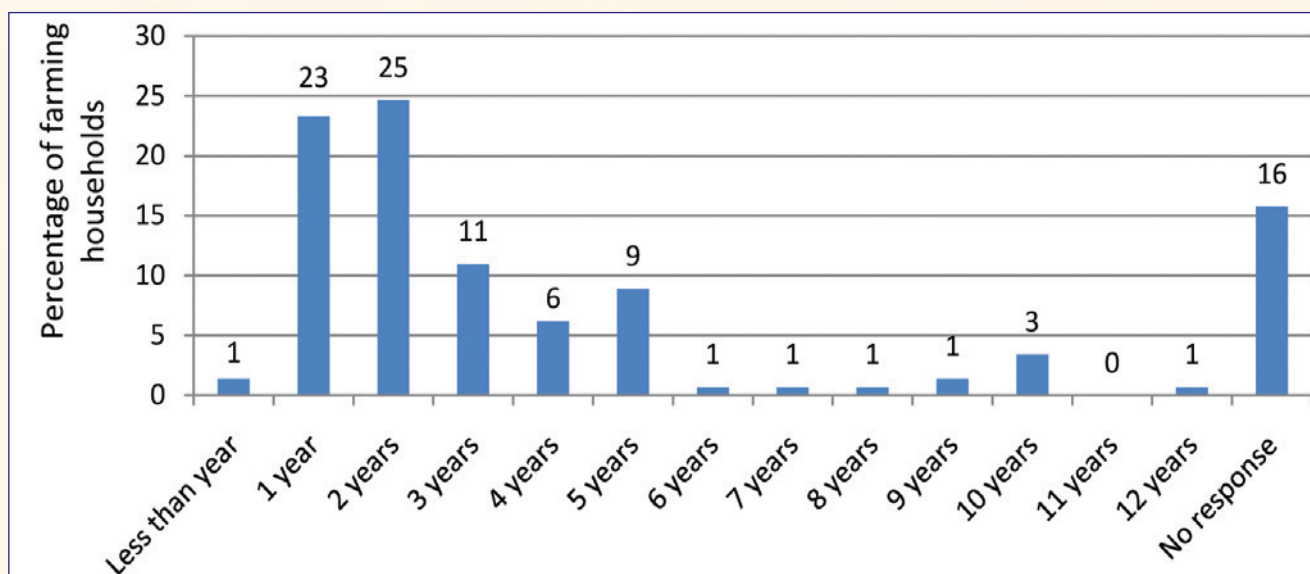
Chart 10.1: From where farming households source finance for agriculture



In total 218 households (44 percent) said they had taken a loan. Of these, just 144 farmers were willing to state the size of the loan they had taken, which ranged from 500 rupees to 50,000 rupees. On average the size of the loan was 13,400 rupees, though the median size of the loan is 8,000 rupees. Of the 144 farmers, 36 farmers had taken loans from moneylenders. It is interesting to note that 61 percent of these households reside in Garhwa district, and 25 percent in Dumka district. The average size of these loans (n=36) was 10,400 rupees, as compared to the average of 13,400 rupees for the total number of farmers who stated their size of loan (n=144).

Of the 144 farmers who gave details of their loan, 35 percent had fully repaid (51 farmers), 16 percent had partly repaid (23 farmers), while 49 percent had yet to repay their loan (70 farmers). The majority (60 percent) are in debt for the past three or less years; though a few (11 farmers) have been in debt for six years or more (chart 10.2). Of these 144 farmers, 79 percent said they are (or were) stressed because of their debt and the difficulties they faced repaying their loan.

Chart 10.2: Number of years in debt, by percentage of farming household



Crop insurance

As stated in section 1, the Pradhan Mantri Fasal Bima Yojana (PMFBY) has replaced earlier crop insurance schemes from kharif 2016 onwards. In July 2017 the incumbent Agricultural Minister said that 62.5 percent of targeted farmers in Jharkhand were covered by PMFBY, up from 42.5 percent in September 2016. Our study showed that as of February-March 2017, 28 percent of surveyed farmers were covered by crop insurance, a significantly lower percentage than that given by the government. As shown in section 9, 85 percent of respondents said their crops have been damaged by weather/drought in the past, and just 12 households said they were compensated for their losses by the government.

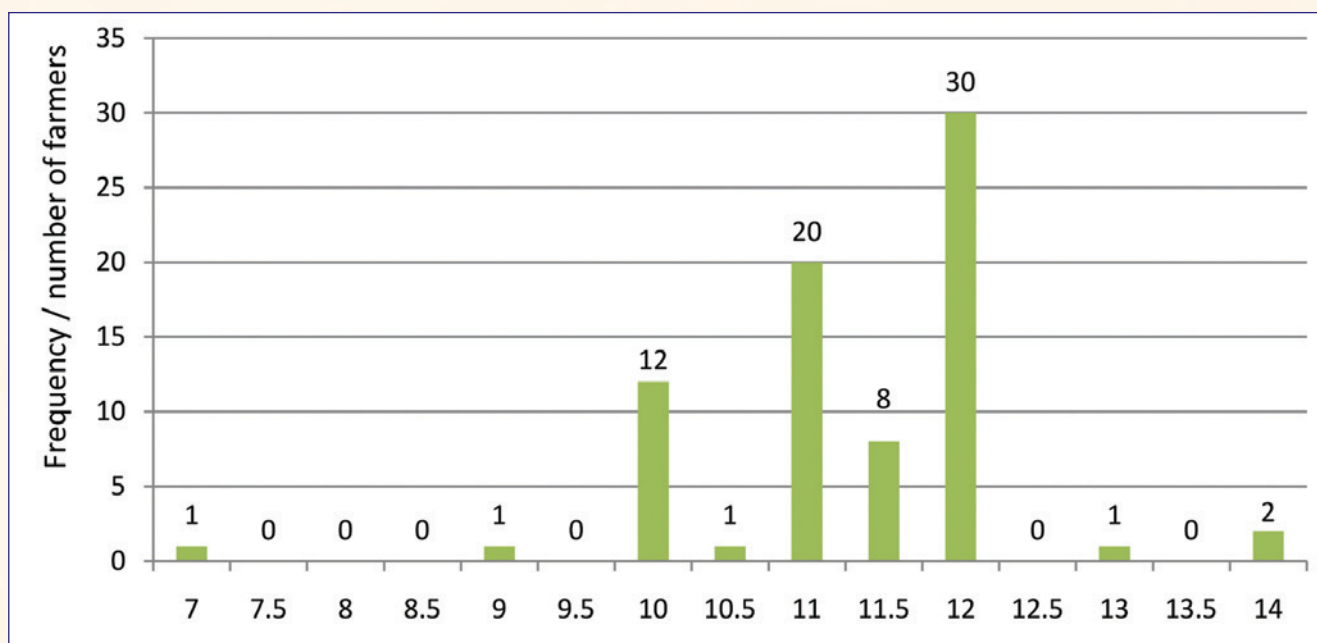
Sale of crops and Minimum Support Price (MSP)

303 households (61 percent) of the surveyed households stated that they sell some of their produce each year. On average, these households earned a total of about 10,000 rupees (median), or 16,900 rupees (mean) (n=258). 201 households sold paddy, 35 households sold other grains, 42 households sold pulses, 39 sold oilseeds, and 157 households sold vegetables. Of these, we asked further questions about the sale of paddy.

The government set the Minimum Support Price (MSP) for paddy at 16 rupees/kilo in December 2016 (1470-1510 rupees per quintal with a bonus of 130 rupees/quintal to be added). Only 21 percent of the surveyed farmers (105 respondents) said they knew the meaning of MSP. Of these, about two-thirds knew that for paddy it is set at 1600 rupees/quintal. Another 18 percent thought it was set at 10 rupees/kilo, and the remainder estimated a value in between 10 and 16 rupees/kilo.

Of the 201 surveyed farmers who sold paddy in 2016, just 76 farmers revealed the rate they sold it at. 39 percent (30 farmers) sold their paddy at 12 rupees/kilo, 26 percent (20 farmers) at 11 rupees/kilo, and 16 percent (12 farmers) at 10 rupees/kilo (chart 10.3). In total, therefore, 93 percent of respondents (71 farmers) said they sold their paddy for between 10 and 12 rupees/kilo. Two farmers received 14 rupees/kilo, whereas one received just 7 rupees/kilo. Not a single of these farmers received the MSP rate set by the government, i.e. 16 rupees/kilo.

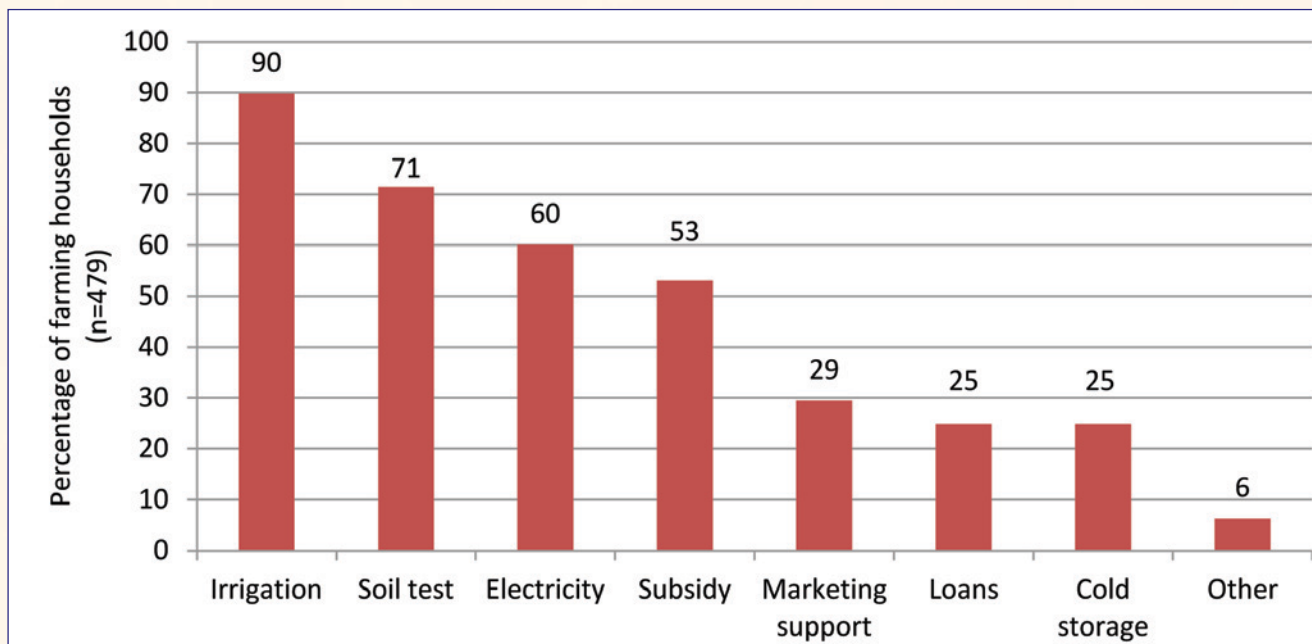
Chart 10.3: Rate (Rs/kg) at which farmers sold their paddy in 2016 (compared with MSP of 16 Rs/kg)



Demands for support as stated by farmers

Just 28 farmers (n=492) said they felt the government was doing a good job in respect to agriculture. When asked for suggestions as to what support should be provided, 479 of 493 farmers responded and gave a range of suggestions (chart 10.4). 90 percent said they need irrigation facilities, 71 percent a soil test, 60 percent electricity to pump irrigation water, 53 percent subsidies, 29 percent support with marketing/sale of produce, 25 percent the need for cold storage facilities, and a further 25 percent (119 farmers) accessible loans. Of the 119 farmers who stated the need for accessible loans, 70 had already taken at least one loan for farming, meaning that 49 farmers who stated the need for a loan have till date refrained from or been unable to take a loan from any source.

Chart 10.4: Suggestions given by farmers as to how the government can support agriculture



11. Summary of findings and recommendations

This study shows that 96 percent of respondents consider agriculture to be their primary livelihood, and that 85 percent of farmers are happy with farming as an occupation. This is despite the fact that just 36 percent of the surveyed farming households claim to be food secure throughout the year (12 months), and one-quarter of households are food insecure producing enough food for just five or less months each year. Only 6 percent of the surveyed respondents said they would quit farming if they had an alternative and almost all farmers (94 percent) said that they want their children to continue farming. This last finding contradicts that of a CSDS study,¹⁰² which shows that less than one-fifth of farmers want their children to continue in farming. These findings indicate that Jharkhand's rural population want to continue farming.

The survey data reveals that 91 percent of farming households in Jharkhand supplement their grown and purchased food with items collected from their surroundings, e.g. 78 percent collect mahua, 69 percent pluck tree leaves to cook as a saag, 70 percent pick wild edible leaves from fields and commons, and 33 percent catch fish in nearby rivers. A higher proportion of adivasi households collect such wild food items as compared to OBC and SC households, though the data shows that across all categories a significant number of households rely on these foods to meet their nutritional needs. These findings show the importance of keeping the natural environment free of pollution, which means use of inputs like chemical pesticides and

¹⁰² CSDS (2014). State of Indian farmers: A report. http://www.lokniti.org/pdf/Farmers_Report_Final.pdf

fertilisers and pollution from industries ought to be reduced and regulated.

Agricultural economists have long argued that to support small-holding agriculture, off-farm jobs need to be created. Yet lack of creation of such employment is a big problem for Jharkhand's farmers. The literature review shows that MGNREGA, which aims to provide income to villagers and creation of assets, suffers several short-comings. These ought to be remedied because there is a dire need for projects to develop irrigation at the village-level. This study shows that about one-third of the surveyed households have a migrant worker, one half (49 percent) of which migrate because there is no employment back home. The huge sums of money allocated to the agriculture sector needs to reach communities and farmers directly. If agriculture could be developed in a sustainable manner, which requires a change of mindset away from input-based cultivation and towards the promotion of sustainable integrated farming, then migration of farmers for low paid work outside of Jharkhand would naturally reduce. Rather than shifting to towns and cities, with the resulting out-flow of money from village to town, families would be more inclined to stay put in their villages. To achieve this, development of education and healthcare facilities in rural areas must be made a priority. The current plan for a smart city at Dhurwa, Ranchi is a glaring example of the lack of vision for inclusive development in Jharkhand, because it will do nothing to address the woes of the majority of the population; neither will it address the development needs of Ranchi's denizens.

In this study's sample, 53 percent of households are marginal farmers (owning less than 1 ha) and 38 percent small farmers (1-2 ha) (as compared to the Agricultural Census 2010-11 in which 68 percent of Jharkhand's farmers are shown to be marginal and 16 percent small farmers). Our method of calculating landholdings went further than owned land to include cultivated forest land, g.m. land and land taken in or given out on share and contract basis. The study shows that 98 households (n=493) farm an average of 1.06 acres forest land; a total of 103.8 acres of forest land. Also that 23 percent of households (115 households) cultivate an average of 0.72 acres of g.m. land; a total of 83.3 acres of g.m. land. The data also shows that contract and share-cropping arrangements bring an overall net increase of 43.9 acres under the plough (n=493) – land that might otherwise be uncultivated. In total, inclusion of forest, g.m. and share/contract land add 231 acres to the total area cultivated by our sample households (n=493) – a significant acreage that comprises 17 percent of the total area cultivated (1371 acres) by the sample. Inclusion of these land types increases the average area cultivated per household, from 2.31 to 2.78 acres per household. The government would help farmers by giving them the title deeds to the forest and g.m. land they cultivate. Only unproductive land should be allotted to industries with the permission of gram sabhas and with strict adherence to stringent environmental regulations, to ensure the environment is not polluted and farming communities are not negatively affected.

The vast majority (83 percent) of farming households grow cereals, pulses, oilseeds and vegetables; and on average, a household grows 10 or 11 different crops. 98 percent of households grow paddy, 54 percent – mostly from northern Jharkhand – grow maize, 28 percent grow wheat, and 22 percent – mostly in Khunti, Gumla and Simdega districts – grow maduwa (finger millet). Small numbers grow barley, sorghum, foxtail millet and other cereals. Landholding size doesn't greatly affect the decision of which crop to grow. However social category plays a role, as according to our sample, SC households are more likely to grow maize, wheat and barley than OBC and ST households, whereas the reverse is true for millets. 39 percent of respondents have stopped growing gondli (foxtail millet), the majority in Khunti, Dumka and Ranchi districts, and 28 percent have stopped cultivation of maduwa (finger millet), the majority in Khunti, Ranchi and Hazaribagh districts. The reasons for shunning millets include the promotion and uptake of other crop types (hybrids), non-inclusion of millets in the Public Distribution System (PDS), and changing weather patterns, e.g. failure or poor rains at the onset of the monsoon. The Government of Jharkhand could follow the example set by other states like Odisha¹⁰³ to incorporate nutritious millets and other crops into the PDS.

¹⁰³ Special programme for promotion of millets in tribal areas of Odisha: "Securing nutrition and surviving droughts" DHAN Foundation. <http://www.dhan.org/smallmillets2/file/SPECIAL%20PROGRAMME%20FOR%20PROMOTION%20OF%20MILLETS%20IN%20TRIBAL%20AREAS%20OF%20ODISHA.pdf>

The most popular pulses grown by farmers include kurthi (58 percent of respondents), urad (53 percent), and rahar (50 percent). There is little variation by landholding size in the cultivation of pulses. The two most popular oilseeds grown by the surveyed households are mustard (56 percent of farmers) and sargunja (46 percent). Next come mungphali, tisi, kudrum and til, each of which is grown by less than one-fifth of farmers. Mustard is grown in the northern parts of Jharkhand, by a majority in Dumka, Palamau and Hazaribagh clusters, and by over half of respondents in Ranchi and Khunti. Sargunja is most popular in Ranchi and Gumla clusters, grown by about three-quarters of households, and in Hazaribagh cluster. Vegetable cultivation, especially of non-local vegetables, has been popularised in recent decades due to the introduction to the market of hybrid seeds. 93 percent of respondents grow vegetables, yet only two-fifths of households have access to local seeds. 67 percent of respondents grow tomato, 64 percent potato, and 44 percent brinjal, whereas about one-third of respondents grow radish and bodi. Households stated they have given up cultivation of certain crops due to lack of water/irrigation (36 percent), untimely or less rainfall (21 percent), lack of local seed (17 percent), and low returns (8 percent).

The recent private sector-led introduction of F_1 hybrid seed to the market has caused a steep decline in availability of local seed. Yet three-quarters (76 percent) of the surveyed households still have access to some kind of local seed. The data shows that a higher proportion of ST farmers, followed by OBC farmers, have access to local seed, as compared to SC farmers. Two-thirds of households, concentrated in Dumka, Gumla and Singhbhum clusters, said they can access the seeds of local varieties of cereals. Nevertheless, most farmers said the shortage of local seeds worries them, for reasons including cost of hybrid seed (58 percent), loss of independence (36 percent), and lack of quality/taste of hybrids (28 percent). The Government of Jharkhand – and society at large – ought to take seriously the matter of preserving local seed, not only because it is a cultural heritage, but because a rich agro-biodiversity will be important for surviving climate change. To achieve more than the mere registration of farmers' varieties, a shift in mindset away from Green Revolution thinking and towards natural/organic farming is required. If a demand and market for organic produce can be developed (in Jharkhand itself); then farmers will be more confident to move to organic, chemical-free agriculture.

The private sector – largely foreign and Indian multinational corporations (MNCs) and also Indian companies – has been active in Jharkhand for the past 30 years, and increasingly so in the past 10 years. Hybrid seeds are extensively advertised to farmers, and gifts like buckets or umbrellas are given away with purchased packets of hybrid rice. One half of the total households interviewed (52 percent) have bought F_1 hybrid rice. The purchase and use of F_1 hybrid rice grew slowly from the late 1990s until about 2006-07, after which its uptake increased rapidly. 81 percent of the sampled farmers in Palamau, Latehar, Hazaribagh, Ramgarh, Ranchi and Khunti grow F_1 hybrid rice; whereas none of the surveyed farmers in Dumka, and only a few farmers in Singhbhum and Gumla clusters (6 and 29 percent respectively), have purchased hybrid rice. Regardless of their origin – foreign or Indian – multinational corporations are motivated by profit and do not have the interests of farmers at heart. Over two-thirds of farmers have grown a High Yielding Variety (HYV) of rice. Farmers grow combinations of different rice types and varieties on their various land parcels. For example, in the 2016 kharif season 18 percent grew only local varieties, 17 percent grew only HYV varieties, and 16 percent grew only F_1 hybrid varieties; whereas 48 percent of households grew combinations of the three rice types. In all, roughly half of the interviewed farmers grew traditional varieties. Given the uncertainty of climate change, efforts are required to ensure traditional varieties of rice continue to be cultivated in-situ. Jharkhand's Department of Agriculture and Cooperation ought to ensure the in-situ preservation of whichever local varieties are still cultivated.

The use of chemical fertilisers and chemical pesticides has grown rapidly in the past decade or so. 92 percent of farmers have used chemical fertiliser. There was a steady increase in its use from the early 1980s up until 2004-05, and then a rapid increase in uptake thereafter. Three-quarters of respondents said that they

increase the amount of chemical fertiliser they apply each year. Much of Jharkhand's farmland has a fragile, shallow soil, so fertiliser use easily damages the health of the soil. Two-thirds of farmers believe the use of chemical fertilisers has worsened the quality of their soil. 86 percent of farmers continue to apply cow dung as fertiliser, alongside chemical inputs, while 89 percent of farmer respondents keep at least a pair of bullocks for ploughing. It is recommended that the provision of Soil Health Cards under NMSA should not be used merely to prescribe more chemical fertiliser use to farmers; alternative techniques to improve soil fertility need to be promoted.

Three-quarters of the surveyed farming households use chemical pesticides on their crops, the usage of which has steadily grown since the early 1990s. The use of pesticides is not uniform across Jharkhand however. Analysis at the district level reveals that many farmers in Garhwa, Khunti, Simdega, West Singhbhum and Saraikela Kharswan districts do not use chemical pesticides; however the majority of farmers in Dumka, Latehar, Hazaribagh, Ranchi, Khunti, Gumla, Garhwa and West Singhbhum do use these harmful products. Farmers do not use protective clothing when applying pesticide, even though 90 percent said that they are aware that pesticides are dangerous to human health. What's more, as ongoing research shows, across Jharkhand farmers are illegally applying the wrong pesticides to their crops, for example, applying pesticides intended for rice or cotton to vegetables, which has an unacknowledged and unknown health impact on consumers. The Government of Jharkhand is strongly urged to regulate this sector. In particular, the sale of pesticides approved for use only on cotton (insecticides) and in tea gardens (herbicides) should be banned in Jharkhand, with care taken to ensure surplus stock is not sold off to farmers. Awareness needs to be raised and information provided to farmers about alternatives to chemical pesticides. This study shows that just 14 percent of the surveyed farmers use traditional pesticides. Programmes like the Mahila Kisan Sashaktikaran Pariyojana (MKSP), implemented through NGOs, need to be continued and expanded.

Almost all farmers (89 percent) stated that they believe the weather has changed in the past ten years. More specifically, nearly all farmers felt the kharif and rabi season rains are untimely as compared with the past. 92 percent felt it is hotter now as compared to before, the majority feeling that the increase in temperature affects agriculture negatively. 85 percent of respondents said their crops have been damaged by weather/drought in the past, with 383 households estimating an average loss of 22,700 rupees (median loss of 16,000 rupees). Yet only 12 households said they were compensated for their losses by the government. Just 28 percent of farmers (n=493) said that they had crop insurance, yet official figures are higher: late July 2017, the Agricultural Minister claimed 62.5 percent of farmers were covered by the PMFBY insurance scheme, up from 42.5 percent in September 2016. The state government should ensure that it releases its share of the subsidy on time; and that at the field level, officials properly establish entitlements to compensation.

Under conditions of climate uncertainty, provision of assured irrigation is a necessity. Our survey data found that 182 of 493 farming households (37 percent) have access to irrigation water. 28 percent (138 households) of all the surveyed households own or have access to a well, the commonest irrigation facility. 78 percent of the wells were constructed by the government, which is a success worth highlighting. Of the 138 farmers with wells, 120 farmers use the water for irrigating crops, and of these, 61 farmers sell some of their irrigated crops. 55 of our sample farmers (11 percent) own or have access to a pond (talab or bandh), while another 7 percent of all the surveyed farmers have access to canal water. The data shows that access to irrigation facilities is tied to farm size – which is itself a proxy for wealth. Over half (53 percent) of medium size farmers have access to irrigation water, compared to less than one-third (31 percent) of marginal farmers. The government is advised to make sincere efforts to increase the area under irrigation. Rather than individual-farmer projects that cannot irrigate large command areas (and which are more likely to be captured by larger farmers), the government should transfer funds to gram sabhas to allow farming communities to themselves design and oversee the construction of small-scale surface water irrigation facilities. This strategy will plug the leakages inherent in contractor-led projects.

Financing agriculture, especially if one follows the industrial farming model, is costly. If one works on the basis that farmers need to take loans to cultivate, then government support to farming can be said to be lacking. 65 percent of farmers (311 farmers) stated they use their own earnings, and 60 percent engage in exchange labour. In total, 44 percent of households had taken a loan for farming. 19 percent had taken loans from their family, 12 percent from banks, 8 percent from the Kisan Credit Card (KCC) scheme, 10 percent from Self Help Groups (or mahila samitis), while just two of the surveyed households had taken loans from government cooperative societies. 9 percent of the sampled households, the majority from Garhwa and Dumka, borrow from money lenders. 144 farmers were willing to divulge the details of their loans, which ranged in size from 500 to 50,000 rupees and averaged 13,400 rupees (median 8,000 rupees). Of these, 35 percent had fully repaid, 16 percent partly repaid, while 49 percent had yet to repay their loan. The majority are/were stressed with the prospect of repaying their loan. The government needs to ensure that farmers indebted under KCC are not harassed by bank or other officials. Serious thought needs to be given to the model of agriculture being pushed on farmers, because economically impoverished, erstwhile subsistence farmers cannot easily adapt to the pressure of sudden indebtedness.

61 percent of the surveyed households sell some of their produce, and on average earn 10,000 rupees (median) or 16,900 rupees (mean) per year (n=258). 201 households had sold paddy, 35 households sold other grains, 42 households sold pulses, 39 sold oilseeds, and 157 households sold vegetables. Only 21 percent of respondents said they knew the meaning of MSP – Minimum Support Price. Of these, about two-thirds rightly considered it set at 1600 rupees/quintal, whereas 18 percent thought it was set at 10 rupees/kilo, and the remainder between 10 and 16 rupees/kilo. Of 76 farmers who sold paddy in 2016 and provided further details, 93 percent sold their paddy for between 10 and 12 rupees/kilo. Just two farmers received 14 rupees/kilo. Therefore, not a single of the surveyed households availed the MSP (of 16 rupees/kilo). Sincere efforts are required by the government to improve the income of farmers: mandis, storage and processing facilities need to be built to procure produce at a rate remunerative to farmers, and monopolies of traders and middlemen need to be broken.

Farmers are happy with their profession but need more support. Currently the majority have insufficient irrigation facilities, and in the absence of government or NGO support are reliant on the advice of agro-input retailers and the salesmen of private companies. This has led to the dangerous misuse of chemical pesticides; which can perhaps be considered a form of mass poisoning. The sale of hybrid seeds has caused a rapid decline in availability of local seeds and has ruined the traditional farming system, which up until 20 or so years ago was self-sustaining and environmentally sustainable; if not sufficiently productive. The surveyed farmers stated their demands. 90 percent stated their need for irrigation facilities and 60 percent electricity connectivity to pump irrigation water. 71 percent stated a need for a soil test, which indicates that farmers need support to understand soil types and methods of soil fertilisation. 53 percent stated a need for subsidies and 25 percent a need for accessible loans. 29 percent stated a need for support with marketing/sale of produce, and a further 25 percent stated the need for cold storage facilities.

More support is needed from government agencies, policy experts, farmers organisations (like the All India Kisan Sabha), civil society organisations, and academics to assist farmers to knowingly and confidently move towards a sustainable, productive and remunerative form of agriculture in the upcoming years. To this end, the set of demands made by farmers at a seminar held in Ranchi in April 2017, listed in Appendix 1, should be taken into consideration. A set of recommendations proposed by the General Secretary of the All India Kisan Sabha (AIKS), K.D. Singh, can also be referred to in Appendix 4.



Appendix 1

Outcome of the 2-day seminar: demands made by the delegates

A seminar was held in Ranchi on 8-9 April 2017 titled Present Agrarian Crisis in Jharkhand. Several hundred people attended the event, including farmers from across Jharkhand. Guest speakers from outside of Jharkhand included Devinder Sharma (food policy expert), Dr Rajendra Singh (Rajasthan), C Jayakumar (Kerala), MJ Prabu (Farmer's notebook), Abdur Rahaman (West Bengal), Abhijit Mohanty (Odisha), and Tushar Chakroborty (West Bengal). From Jharkhand, the speakers included Prof Ramesh Sharan (now the VC of Hazaribagh University), Simon Oraon (Jharkhand's Waterman), Prof Uday Kumar (Ranchi University), Dr Nitish Priyadarshi (Geologist), Jawahar Mehta (Vikas Sahyog Kendra), Prof RP Singh Ratan (Birsa Agricultural University), Md Shaban (Centre for World Solidarity), Dr Sucheta Sen (Central University of Jharkhand), and Jean Dreze (Ranchi University), James Herenz and Balram of the Right to Food Campaign (see <http://www.righttofoodcampaign.in/state-campaigns/jharkhand>).

At the end of the seminar, the delegates came up with a set of demands:

- 1) State level agricultural policy should be formulated with consultation of gram sabhas
- 2) All agricultural programmes/schemes should be implemented by gram sabhas
- 3) State should determine the MSP, and whatever farmers produce the state should procure through local mandis
- 4) Local or traditional seed must be protected, preserved and distributed by government
- 5) The government must extend support to farmers at the right time
- 6) Agriculture must be developed keeping in mind the (agro-)ecology to ensure protection and preservation of biodiversity
- 7) Government must take permission of gram sabhas for acquisition of land
- 8) Rights over water, forest and land should be provided to gram sabhas
- 9) Without permission, companies or government cannot take land for any project
- 10) Gram sabhas will undertake social audits for all schemes on poverty eradication and livelihoods
- 11) Gram sabhas must monitor all violations of constitutional rights by government and non-government entities
- 12) Productive agricultural and forest land should not be given to mining projects or industry

Appendix 2

Questionnaire format for survey (Codes are omitted)

Please explain to the respondent(s) that the information collected will be kept anonymous and confidential. Please ask them to be honest in their responses.

Section 1: Basic information on respondent

- | | | | |
|----|---------------------------|----|---------------------------|
| 1a | Name of farmer 1: | 1b | Name of farmer 2: |
| 2a | Male or female (M/F): | 2b | Male or female (M/F): |
| 3a | Age: | 3b | Age |
| 4a | Aadhar card holder (Y/N): | 4b | Aadhar card holder (Y/N): |
| 5a | Bank account (Y/N): | 5b | Bank account (Y/N): |
| 6a | Community/category | 6b | Community/category |
| 7a | Jati: | 7b | Jati |
| 8 | BPL card holder (Y/N): | | |
| 9 | Phone number: | | |
| 10 | District: | | |
| 11 | Block: | | |
| 12 | Gram Panchayat: | | |
| 13 | Revenue Village: | | |
| 14 | Ward number: | | |
| 15 | Tola name: | | |
| 16 | Name of enumerator: | | |
| 17 | Date survey conducted: | | |

Section 2: Household information :

- 18 Total number of household members (inc. migrants):
- 19 Main occupation of adults (code):
- 20 Second occupation of adults (code):
- 21 Are there any migrants in family (Yes/No)?
- 22 If yes, for how many months are they away (number months)?
- 23 If yes, occupation (code):
- 24 If yes, give place of migration (state, and district or town):
- 25 If yes, what is the reason for migration (code)?

Section 3: Agricultural production in current and previous year (2016-17)

3.1 Land

- | | | | | | |
|-----|---|-----|-------------|-----|---------------|
| 26a | Homestead (acres): | 26b | Cultivated: | 26c | Uncultivated: |
| 26d | Total Don land (acres) | 26e | Cultivated: | 26f | Uncultivated: |
| 26g | Total Tanr land (acres): | 26h | Cultivated: | 26i | Uncultivated: |
| 26j | Total Landholdings (acres) | 26k | Cultivated: | 26l | Uncultivated: |
| 27 | Do you farm on forest land (y/n)? | | | | |
| 28 | If so, how much (acres): | | | | |
| 29 | Do you farm on 'government waste land' (y/n)? | | | | |
| 30 | If so, how much (acres): | | | | |
| 31 | Rented-in on contract or share (y/n)? | | | | |
| 32 | If so, how much (acres): | | | | |
| 33 | Rented-out on contract or share (y/n)? | | | | |
| 34 | If so, how much (acres): | | | | |
| 35 | Total cultivated (acres): [26k+28+30+32-34] | | | | |

3.2 Crops grown

- 36 List the cereals you grow (codes): ____, ____, ____, ____, ____
- 37 How is production compared to 10 years ago? ____
- 38 Why is this? ____
- 39 List the pulses grown (codes): ____, ____, ____, ____, ____
- 40 How is production compared to 10 years ago? ____
- 41 Why is this? ____

- 42 List the oilseeds grown (codes): ____, ____, ____, ____, ____
- 43 How is production compared to 10 years ago? ____
- 44 Why is this? ____
- 45 List the vegetables grown (codes): ____, ____, ____, ____, ____, ____
- 46 How is production compared to 10 years ago? ____
- 47 Why is this? ____
- 48 Do you sell any produce (y/n)?
- 49 If yes, what: ____, ____, ____, ____
- 50 If yes, what is the income (total annual income, in rupees) ____
- 51 How many months of the year do you consume your own food (food security in months): ____

3.3 Seeds

- 52 Do you have access to local seeds (y/n)? ____
- 53 If yes, which types (code): ____, ____, ____, ____
- 54 Does shortage or absence of local seeds worry you (y/n)? ____
- 55 If yes, please explain why? ____
- 56 Have you bought hybrid rice before (y/n)?
- 56a If you grow hybrid rice, please give name(s) of the hybrid: ____, ____, ____
- 57 Since which year have you grown hybrid?
- 58 Have you ever bought HYV seed (y/n)?
- 59 If yes, which one?
- 60 Since which year have you grown HYV?
- 61 In the past year (2016-17) which types of rice did you grow?

3.4 Chemical inputs

- 62 Do you use chemical fertilisers (Y/N)? ____
- 63 If yes, which do you use: ____, ____, ____
- 64 If yes, since when (give year): ____
- 65 If yes, is your use/application of chemical fertiliser increasing each year (Y/N)?
- 66 If yes, do you also use gobar (y/n): ____
- 67 If yes, has quality of soil changed due to use of chemical fertiliser? ____
- 68 If yes, do you know how to treat this (y/n): ____
- 69 If yes how? ____
- 70 Do you use chemical pesticides (y/n)? ____
- 71 If yes, since when (give year): ____
- 72 Do you think chemical pesticides have bad effects (y/n)? ____
- 73 If yes, can you say what the bad effects are? ____
- 74 Do you use any traditional/local pesticides (y/n): ____
- 75 If yes, please explain: ____

3.5 Irrigation

- 76 Do you have irrigation facilities (y/n)? ____
- 77 Do you have a talab (y/n): ____
- 78 If yes, do you use for irrigating your crops e.g. rice, vegetables (Y/n)? ____
- 79 If yes, do you sell some of the irrigated crops (y/n)? ____
- 80 If yes, do you use pumpset to bring water to plot (y/n)? ____
- 81 If yes, how is pumpset powered (code) ____
- 82 If yes, who funded construction of the talab (code)? ____
- 83 Do you have a well in farmland (y/n): ____
- 84 If yes, do you use for irrigating your crops e.g. rice, vegetables (Y/n)? ____
- 85 If yes, do you sell some of the irrigated crops (y/n)? ____
- 86 If yes, do you use pumpset to bring water to plot (y/n)? ____
- 87 If yes, how is pumpset powered (code) ____
- 88 If yes, who funded construction of the well (self/govt)? ____
- 89 Do you have a tubewell/deepboring in farmland (y/n): ____
- 90 If yes, do you use for irrigating your crops e.g. rice, vegetables (y/n)? ____
- 91 If yes, do you sell some of the irrigated crops (y/n)? ____
- 93 If yes, who funded construction of the tubewell/deepboring (code): ____
- 94 Do you have an irrigation canal in your village (y/n): ____

- 95 If yes, do you use for irrigating your crops e.g. rice, vegetables (Y/n)? ____
- 96 If yes, do you sell some of the irrigated crops (y/n)? ____
- 97 If yes, what is source of canal (e.g. name of reservoir or river): ____
- 98 If yes, did the government construct the canal (y/n): ____
- 99 If yes, when was canal completed: ____

3.6 Livestock for farming

- 100 Do you have bullocks/water buffalo for ploughing (y/n): ____
- 101 If yes, how many 'ploughs'/pairs: ____
- 102 If no, did you used to have (y/n)? ____
- 103 So why do you not have them now? ____
- 104 Do you keep cows/bullocks/buffalo for sake of cow manure (y/n): ____

3.7 Financing agricultural production

- 105 How do you spend for crop production? ____
- 106 Have you taken loans for farming (y/n): ____
- 107 If yes, how much (rupees): ____
- 108 Have you repaid any loans (y/n)? ____
- 109 If yes, how much (rupees)? ____
- 110 To whom do you owe the money: ____
- 111 If yes, for how many years have you been in debt: ____
- 112 If yes, are you/were you stressed because of it (y/n): ____
- 113 Do you know of any farmer who has committed suicide due to stress of farming (y/n): ____
- 114 If yes, please give details: ____

3.8 Support for farming and problems in agriculture

- 115 Have you received any support for farming from the block, govt or BAU (Y/N)? ____
- 116 If yes what: ____
- 117 Have you received any information on farming from the government or BAU (Y/N)? ____
- 118 If yes, what: ____
- 119 Overall is the government doing a good job to support farming (y/n)? ____
- 120 What steps do you think are required from government to support farmers? (code): ____
- 121 Do you know about MSP for rice/paddy (y/n)? ____
- 122 If yes, how much is it currently set at (rupees/kilo)? ____
- 123 Have you sold paddy in last year (y/n)? ____
- 124a If yes, for what price (rupees/kilo): ____
- 124b If yes, for what value (total in rupees) ____
- 125 Do you get BPL rice/wheat (y/n)? ____
- 126 If yes what do you think about quality? ____
- 127 If yes has receipt of BPL rice changed your production/consumption pattern (yes/no)? ____
- 128 If yes, how (code) ____
- 129 Have you received any support for farming from NGOs (Y/N)? ____
- 130 If yes, which NGO(s)? ____
- 131 If yes, what support? ____
- 132 Are there any other problems you face in farming (that have not been mentioned)?

Section 4: Agricultural production in past 10 years

4.1 Land use and cropping pattern

- 133 Has any of your land been damaged or spoiled due mining activities (e.g. crusher, mining) (Y/N):
- 134 If yes, please explain: ____
- 135 Has any of your land been lost or destroyed due to other activities (e.g. crusher, mining) (Y/N): _
- 136 If yes, please explain: ____
- 137a Did you receive compensation (y/n)? ____
- 137b If so, how much: ____
- 138 Have you changed the crops you grow in the past 10 years (y/n): ____
- 139 If yes, how: ____
- 140 Can you name crops/vegetables you used to grow that you no longer grow (code): ____, ____, ____
- 141 Why do you no longer grow these? ____

4.2 Weather

- 142 Has the weather changed in the past 10 years? ____
- 143 Are the kharif rains timely like they were in the past? ____
- 144 If no, what has changed (codes): ____
- 145 If no, what is the effect on farming: ____
- 146 Are the rabi/winter rains timely like they were in the past? ____
- 147 If no, what has changed (codes): ____
- 148 If no, what is the effect on farming: ____
- 149 Is it hotter nowadays as compared with before (y/n)? ____
- 150 If yes, is there any effect on farming (y/n)? ____
- 151 If yes, what: ____
- 152 Are there more hailstorms as compared to past (y/n): ____
- 153 If yes, is there any effect on farming (y/n)? ____
- 154 Have your crops ever been damaged due to weather/flood/drought (y/n)? ____
- 155 If yes, most recently in which year? ____
- 156 If yes, what was the reason? ____
- 157 If yes, what was your loss (rupees)? ____
- 158a If yes, did you get compensation from govt (y/n)? ____
- 158b If so, how much ____
- 159 Do you have crop insurance (y/n)? ____
- 160 If yes, which: ____

4.3 Food and diet

- 161 In addition to grown/purchased food, do you collect other food from your surroundings (y/n)?
- 162 If so, what (code)? ____
- 163 Do you fish in river (Y/N)? ____
- 164 Do you catch fish in fields (Y/N)? ____
- 165 Do you use leaves of trees as food (Y/N)? ____
- 166 Do you pick wild leaves from fields for food (Y/N)? ____
- 167 Do you collect food from forest (NTFPs) (Y/N)? ____
- 168 Has any of this been affected by pollution/other activities in past 10 years (y/n)? ____
- 169 If yes, how: ____
- 170 Has the diversity of food you eat in your household changed in last 10 years (y/n)? ____
- 171 If yes, how has it changed? ____
- 172 How is your family's nutritional intake compared to 10 years ago?
- 173 Why? ____

Section 5: Last questions

- 174 Would you quit farming if you had an alternative? ____
- 175 Are you generally happy with farming as an occupation? ____
- 176 Do you want your children to continue farming? ____
- 177 Do you know of farmers who have given up farming due to lack of an alternative? ____

End of Household Survey

(Thank Respondent(s), and reassure them the survey data is confidential.
Give them your phone number, and take their phone number, in case of further questions)

Appendix 3

List of villages where the farmer survey was conducted

No.	Cluster	District	Block	Gram panchayat	Village
1	Dumka	Dumka	Dumka	Karabani	Karabani
				Bhurkunda	Dhowanchipa
			Kathikund	Teliyajak Bazaar	Nayadih
				Bijhayapahari	Jamni
2	Palamau	Garhwa	Garhwa	Kalyanpur	Kalyanpur
			Ranka	Katra	Siroi-Kala
			Meral	Tishartetuka	Kolodhohar
			Ramna	Gamhariya	Gamhariya
		Latehar	Balumath	Dhadhu	Chitarpur
			Latehar	Nevadi	Ambajharan
3	Hazaribagh	Hazaribagh	Dhadhi	Honhemodhha	Chaunpur
			Badhkagaw	Gondlpura	Gali
				Badhay	Kutuluwa
		Ramgarh	Mandu	Pindra	Barisam
			Mandar	Nagra	Nagra
4	Ranchi	Ranchi	Tamar	Mardhan	Udaydih
				Parasi	Gumaandih (& Kutachawli)
	Khunti	Khunti	Khunti	Siladhon	Irudh
					Remta
					Chukru
					Rbangdhag
	Gumla	Gumla	Palkot	Jhikirama	Jhikirama
				Tapkara	Bardhi
5		Simdega	Kolewira	Nawa Toli	Sundra Toli
					Gwrghasa
					Taisera
6	Singhbhum	West Singhbhum	Manoharpur	Raidih	Raidih
			Anandpur	Biju	Lorponda
			Khuntpani	Lorda	Kotsana
		Saraikela Kharswan	Saraikela	Pathanmara	Ghobadih
Total	6	11	20	25	30

Appendix 4

Policy recommendations of the General Secretary, AIKS-Jharkhand State

The All India Kisan Sabha has given a slogan, “Kisan bachao, gaon bachao. Gaon bachao, desh bachao”. For this the following are required:

1. The vision of Tilka Manjhi, Sido, Kanhu, Chand, Bhairav, Nilamber, Pitamber, Birsa Munda, should be implemented meaning thereby that the mines, minerals (land) and forest should be owned by the farmers who should receive royalties. After formation of Jharkhand the government has not understood that mines and minerals, coal and iron ore, water and forest, is a part of agriculture. Without these, farmers are left to plough without any money. With all of these included, a concept of Jharkhand will emerge and the agrarian crisis can be solved.
2. Uniformity is needed in education and healthcare provision, to keep farmers’ children in the village. While government education is weak in the village, farmers are bound to sell their land and shift to towns or send their children to towns. Even servicemen, police and military are leaving the villages, taking with them capital that should be invested in agriculture. This is an economic drain. Educational institutions should be modernised in the villages and the curriculum updated to reflect latest science and technology. Healthcare system needs to be developed.
3. Market system. Government should make a policy for a remunerative price of farmers’ crops. For this, a terminal system should be developed.
4. Development and ownership of forests should be given to the villagers so that they feel the forest is theirs. Then medicines, fruits, firewood, and other food and non-food products can be utilised fully. Use of mahua oil and karanj oil can be revived.
5. Forested mountains need to be considered reservoirs for water. If the mountains are protected and developed, the rivers and streams will provide sufficient water for irrigation.
6. Agricultural projects to ensure the irrigation of agricultural land need to be developed. New technologies for irrigation should be available. Irrigation projects should be completed properly and on time.
7. Traditional seed and fertiliser. BAU should be given the responsibility to research these resources. Training for organic fertiliser and pesticide production needs to be provided in every village, and local seeds need to be sown and thus preserved.
8. Pension of 10,000 rupees/monthly should be provided to all farmers, farm labourers and artisans above 60 years of age.
9. Reservation by caste should end, and sons of farmers, farm labourers, and artisans should be given reservation for medical, engineering and government service. Such professionals will be willing to live in the villages, and farmers will not feel the need to leave the villages.
10. Government officials, officers, bankers and businessmen treat farmers as second grade citizens. This needs to end, and a policy is required for enhancing the prestige of farmers.
11. At the village level, training to modernise agriculture, animal husbandry, fisheries, piggeries and poultry is required.

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