

Employment Opportunities in Rural Bihar with Special Reference to Digital India Policy: A Review

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Abstract: This scoping report seeks to provide the IGC and BMGF with a detailed assessment of the current state of evidence on the priority sectors in Bihar, which will be used to prioritise future investments in research. It also provides local and international researchers with insights into the evidence gaps in the priority sectors, as demanded by policy stakeholders in the state. While there is already a considerable evidence base of impact evaluations pertaining to the priority sectors, much of it is concentrated on a small number of topics and focused on specific programmes, answering only a subset of crucial research questions. During the stakeholder consultations, only a few of them felt that, on average, across all interventions, there is sufficient evidence to inform priority sector programming and policy. Furthermore, several articles and evaluation studies include inadequate descriptions around the context of the evaluation, the interventions, and associated theories of change. In areas for which there is already a sizable evidence base, the research is generally specific to a very particular context or topic and not able to provide broader critical insights.

Keywords: Employment Opportunities, Special Reference, Digital India Policy.

I. INTRODUCTION

The gap between research and policy priorities has always presented an enormous challenge both for academics and policymakers. With a scarcity of rigorous evidence in certain areas, this gap is particularly large in Bihar. To address this, IGC India, in collaboration with the BMGF, is in the process of identifying the current state of research and evidence in Bihar for a core set of priority sectors – Health, Agriculture, Financial Inclusion, and Gender. IGC India believes that evidence based on economic and social policy research, both at the basic and applied level, is crucial in the search for solutions to Bihar's development challenges. It is generally recognized that strengthening policy research yields dividends in the formulation of well-informed development policies, which will make development more effective and improve people's lives. This scoping paper provides an independent analysis of the evidence in the priority sectors and identifies key policy and research priorities that are in need of more rigorous evidence. This exercise will enable policy stakeholders to demand more research in crucial areas and understand where new programming and investments can have the greatest impact.

1.1 Objectives

The specific objectives of this paper are:

- To provide independent analysis of the evidence in the priority sectors;
- To recommend areas of research where more rigorous research studies can add value and help decision-makers.

1.2 Methods

For understanding the current state of evidence in Bihar, the IGC India team assessed the information on interventions currently being implemented in Bihar which are relevant to the priority areas, following a search strategy

using keywords, for example – “Bihar” or “Health”. The timeframe was from 2000 up to and including the period of the search (February – March 2018). Eligible articles were (i) related to research conducted in Bihar and published in peer-reviewed journals; and (ii) related to the priority areas in Bihar. Apart from that, we also followed the below mentioned criteria in the selection process.

Date	Exposure of Interest	Geographic Location of Study	Language	Participants
<ul style="list-style-type: none"> As stated, for this Scoping Paper, we only reviewed Peer Reviewed journal articles and impact evaluation studies from January 2000 to March 2018. However, we also understand that a narrow time frame severely limit the number of eligible studies. 	<ul style="list-style-type: none"> For this paper, we only consider those studies where participants experienced a particular conditions i.e. had disease; had no knowledge over technology. 	<ul style="list-style-type: none"> This Scoping Paper only considers studies conducted in Bihar. We limit the review to only studies targeting Bihar because of the current funding (similar socio-economic and demographic factors). 	<ul style="list-style-type: none"> For this Scoping Paper, we only consider studies in English. We excluded studies that are reported in languages other than English simply because of the difficulty of translation but the exclusions may create publication bias. 	<ul style="list-style-type: none"> Reviews only considered studies related to adult; children and adolescents.

Graph – Inclusion and Exclusion Criteria

Reported Outcome	Setting and Nature of Interventions	Study Design	Type of Publications
<ul style="list-style-type: none"> To determine the inclusion process, in this Scoping Paper, we only considered studies which clearly presented the outcomes. We excluded studies which has self-reported outcomes. 	<ul style="list-style-type: none"> The Scoping Paper only included studies which address the treatment efficacy; intervention design; length, timing, and intensity of interventions. 	<ul style="list-style-type: none"> We only include experimental, quasi-experimental and descriptive studies. Apart from that for avoiding the selection biases, we used the quality-weighting approach.** 	<ul style="list-style-type: none"> This Scoping Paper only considers original studies which are Peer Reviewed. Commonly excluded publications are grey literatures, technical reviews and NGOs and Government reports.

All relevant articles were downloaded and reviewed. Studies are eliminated from the bibliography if the titles and abstracts clearly disqualify them or studies that do not include sufficient statistics. At this stage of the selection process, studies are further evaluated to ensure that individual studies meet all inclusion criteria. In the initial search, we got 1657 journal articles and based on the inclusion criteria, we reviewed 200 peer reviewed articles. Out of the 200 papers, 124 (62%) were related to health and nutrition, 42 focused on agriculture (21%) and 34 on financial inclusion (17%).

The information on articles' topics, type of research, type of data collected or used, and level of evidence and content, were extracted from the articles using a standardised template. At the same time, journal articles were classified based on the key sub-topics of interest within the priority area of Health, that is, health systems, public service delivery, governance, health finance, information and communication technology (ICT), and insurance. The type of research was classified as follows: descriptive research (studies related to prevalence, risk, knowledge-attitude and practice), programme implementation research (studies related to efficiency & efficacy), and fundamental research (studies assessing the impact of interventions on the priority sectors). Apart from that, the team also classified the data, distinguishing between original data, secondary analysis data, and non-original. They also surveyed (semi-structured

interviews) practitioners, local researchers, grant-giving institutions, and policymakers working in the priority sectors in Bihar ('stakeholders') to assess perceptions of the state of the evidence, priorities for research to inform policy, and the demand for new evidence. The team analysed a total of 60 responses for this report.

II. KEY FINDINGS FROM SCOPING

For understanding the availability of different types of evidence and identifying the need for research to inform policy as well as the demand for new evidence.

2.1 Profile of the Respondents

All the respondents (except secretaries and principal secretaries of government departments) were requested to provide information about their work history and experience, including the type of organisation for which they work at present, their role, sector experience, and geographic familiarity. They were also asked about how they use evidence, their level of knowledge about priority sectors (organisation-specific), and thoughts on future trends and needs. We did not ask for personal information such as educational background. While analysing the respondents' institutional affiliation, it is seen that the largest share of respondents works in national and international non-governmental organisations (NGOs) (43%), followed by government departments (36%), and research and academic institutions 12%. Significantly fewer (less than 5%) work for both United Nations (UN Agencies) or individual foundations. Respondents were also asked about their priority sector-specific experience and their role within their organisation. Almost half (46%) of the respondents have more than 10 years of experience in the sector (Table 1) and 26% respondents have 5-9 years of experience.

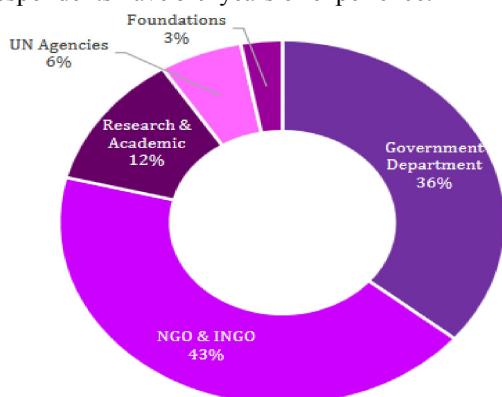


Chart - Institutional affiliation

Length of Experience	% of Respondents
<2 Years	8.9
2-4 Years	14.4
5-9 Years	26
10-19 Years	29
>20 Years	16.8
Not Applicable	5

Table - Length of time working in priority sectors

2.2 Areas Requiring Evidence

When asked about areas where more evidence is needed for policymaking, the majority of interviewees (more than 60%) stated that they require more evidence on health insurance, health finance, cash transfers and their impact on health outcomes, and quality of care. Over 40% of the interviewees stated that they require more evidence on private sector investments in health systems (both delivery and access). One-fifth of respondents said that they need more evidence related to crop insurance, mental health, and use of technology in healthcare services. Conversely, many respondents stated that there is a strong evidence base on the effectiveness of family planning and contraception. While analysing the responses on areas that require greater evidence, we saw that only in the health sector, there is a strong correlation between the areas which require more evidence and the person's area of expertise - but for other sectors, the interviewees who do not have personal expertise in a particular area also prioritised different areas.

2.3 Areas Recommended for Further Research

Forty-two per cent of the interviewees stated that it would be helpful if IGC commissioned more studies on health and nutrition, followed by studies related to gender (40%).

2.4 Recommendations for Research Outcomes

The stakeholder conversations also provided insights into the important outcomes that need to be measured in the priority sectors for better uptake of research. Health outcomes and access to quality care turned out to be the dominant ones (more than half of the respondents). Many respondents also emphasised on equity, social protection policy, and better policy and regulation when considering outcomes (for example, Agricultural Produce Market Committee (APMC) Act).

III. MAPPING EVIDENCE – AVAILABILITY AND GAP

3.1 Literature Review Brief

Based on the inclusion criteria, from January 2000 to February 2018, 200 peer-reviewed articles were published in journals on the priority sectors (Health, Agriculture, and Financial Inclusion) focused on Bihar. For the purpose of this scoping paper, these were accessed through PubMed, Web of Science, and ELDIS, and reviewed, along with 12 Impact Evaluation Studies (3ie Repository). Out of the 200 papers, 124 (62%) were related to health and nutrition, 42 focused on agriculture (21%) and 34 on financial inclusion (17%). We also reviewed 102 systematic reviews related to the priority sectors, which were accessed through Cochrane Library and Evidence for Policy and Practice Information (EPPI) of the University College London database. Research on reproductive health mostly focused on family planning. The majority of health system articles cover health service delivery and governance. Most publications report descriptive studies. The proportion of articles reporting implementation studies was higher in articles addressing health system research.

3.2 Evidence Availability - Health Nutrition and WASH

For understanding where we have evidence what is known and what is unknown and what the priorities are, this mapping exercise will provide insights to IGC and BMGF to prioritise research commissioning, by quickly identifying existing evidence gaps. For assessing the evidence, we only included studies that evaluate the effectiveness of priority sector programmes in Bihar.

3.3 Evidence Availability

Agriculture and Financial Inclusion: For this section, 78 peer-reviewed articles and three impact evaluation studies were reviewed. Bihar has a strong agriculture base with 77% of the work force employed in the sector, while it only contributes approximately 24% to the State Gross Domestic Product (GSDP)⁹. During the 1980s, there was stagnant growth in the agriculture sector in Bihar, mainly on account of lack of public sector investments in physical and institutional infrastructure, poor economic incentives like unfavourable output-to-factor price ratios, slowdown in growth fertiliser use, and inadequate electric power supply and irrigation (Kishor, 2004; Chand, Raju and Pandey, 2007). Looking at the role of irrigation in agriculture, Shah and Ballabh (2000), in their study conducted in the Muzaffarpur district of Bihar, show that the role of pump irrigation is highly beneficial. Also, crop yield and intensity with the use of pump irrigation is far superior to that of non- irrigators (Shah and Ballabh, 1997). Another study by Kishore, Joshi and Pandey (2017) suggests that solar-powered pumps in Bihar have a bigger impact on the productivity of rice–wheat cropping system as they are easy to use and manage, and work well in all seasons of the year (Kishore, Joshi and Pandey, 2017). Besides irrigation, the agriculture sector in Bihar is very sensitive to and greatly influenced by climate change and variability (Sikka, Islam and Rao, 2016). A study of climate change on Indian agriculture conducted by the Indian Council for Agriculture Research (ICAR) shows that yield of wheat in Bihar may decrease by 5% to 6% due to changes in maximum temperature by the end of 2080 (Kumar et al, 2011). However, the impact of climatic change and variability can be mitigated to a great extent by adopting region-specific adaptation measures like soil moisture conservation, pruning and canopy management, mulching, growing intercrops, water and nutrient management, and pest management (Kumar, 2014; Kumar and Kumar, 2016). Designing appropriate agrarian strategies and adopting modern technologies that can tackle the problem of climate change and variability can enhance crop productivity in Bihar (Kumar, 2016, Mehar, Mittal and Prasad 2016). However, a long-term study is required for better

understanding of the soil changes related to different rice establishment technologies in the Gangetic plains of Bihar (Mondal, et al., 2016). In terms of the role of technology in dealing with climate change and associated risks in the agriculture sector in Bihar, Tesfaye (2017) describes the different risks to farmers due to climate change and develops a model that can be locally adapted to minimise the negative effects of climate change. Lopez- Ridaura (2018) develop an innovative food security model that can be used to explore and assess the impact of 'climate smart' agricultural (CSA) practices and climatic shocks on the food security of farm households on an ex-ante basis. On the other hand, Mittal (2016), shows that with precise and timely weather-based agro-advisory messages through mobile solutions to women farmers in Bihar, women farmers can take informed decisions about input use, leading to savings in irrigation and reduced cost of other inputs such as pesticides and fertilisers. These interventions targeted at women farmers help improve their knowledge about climate-smart technologies (Mittal, 2016). Looking at Greenhouse Gas (GHG) emission and global warming potential (GWP), Gupta et al (2015) suggest that site-specific intervention of Resource Conserving Technologies (RCTs) like zero tillage (ZT), integrated nutrient and pest management may lead to reduction in GHG emission in different parts of the Indo-Gangetic plains in Bihar (Gupta et al, 2015). On the role of technology in agricultural productivity, Singh et al (2014) analysed DSSAT v 4.5/CERES- Rice (Decision Support System for Agro-technology Transfer/Crop Estimation through Resource and Environment Synthesis) to validate rice productivity in Bihar and find that the model is capable of estimating, with reasonable accuracy, growth stages and grain yield of rice in different climatic conditions of Bihar, and hence can be used as a tool in making various strategic and tactical decisions related to agriculture planning in the state. ZT is a proven technology for enhancing wheat productivity and hence, food security in the Indo-Gangetic plains. Therefore, there is a need to develop business models that enhance the social inclusiveness of ZT services, and expansion the network of service providers, which will help reduce the transaction costs of reaching smallholders (Keil, D'Souza and McDonald, 2015, 2016, 2017). There is also a need to develop an adaptive strategy such as a thermos-insensitive rice-wheat high-yielding varieties, which is one of the suitable strategies for the sustainability of rice and wheat productivity under extreme temperature conditions due to climate change (Subash, Singh and Priya, 2013).

3.4 Gaps in Evidence

As mentioned earlier, for this scoping paper, we identified 200 peer-reviewed articles, 12 impact evaluation studies, and 102 systematic reviews in order to capture the current state of evidence in the priority sectors and identify gaps here future research is needed. This section discusses these gaps. There is little evidence on the effects of mass media or mHealth14 and other ICT approaches on health outcomes, health services, and agricultural and environmental outcomes in Bihar. One study does measure the effect of a mobile phone programme on improvement in intrapartum practices in Bihar (Das et al. 2017). Another assesses the effect of mobile phone in making agriculture more gender-inclusive (among other outcomes) (Mittal, 2016). While having stakeholder conversations, it became clear that there is a strong interest in more evidence on these types of interventions. There are very few studies that measure effects at the community level (including community based organisations (CBOs)), such as changes in norms, attitudes, or behaviours. While 12 articles provide insights into an intervention focused on community mobilisation and dialogue, most of them measure effects on adolescents and maternal health only. Just three of those studies measure the effects on parents. Only one study surveys the community, measuring attitudes and knowledge among adult community members, on early marriage, reproductive health, nutritional status, and empowerment of girls (Goli, 2015). There is considerable interest among UN (United Nations) agencies and government (Women and Child Development (WCD) and Social Welfare) for generating more evidence in the area of child marriage, especially on interventions creating normative change. We find the lack of reporting on effects in these outcome areas to be an important evidence gap. In addition, we note a dearth in evidence around the use of community health workers and home visits in health and adolescent programmes. Only one study included here evaluates this type of intervention.

V. EVIDENCE NEED AND SUGGESTED RESEARCH AREAS

Through the evidence gap map and in-depth stakeholder consultations, a number of concrete areas that need urgent attention for further research were identified. The below list should guide the process of planning and prioritising research commissioning (in alphabetical order). These were selected on the basis of the frequency and importance with which stakeholders stated them as priority topics, and the lack of reliable and robust existing evidence on them.

Theme (A)	Area (B)	Example of Possible Research Areas Suggested (C)
Adolescent	Abortion	The effectiveness of health and adolescent programmes to address the reduction of abortion rates
	Child Marriage	The effectiveness of interventions for normative change
	Health and Programmes	The effectiveness of abortion-related services – private clinics vs. government hospitals
		The changing fertility patterns and parents' investments in children's human capital
		The effectiveness of school-based health programmes – any causal link with sexual and reproductive health and rights (SRHR) outcomes
		The effectiveness of SABLA (Rajiv Gandhi Scheme for Empowerment of Adolescent Girls)
		Impact evaluation of child marriage programme – the effectiveness of media campaign in reduction of child marriage
		Skills training programme and changing attitudes and behaviours of adolescents
		Weekly iron and folic acid supplementation (WIFS) and Anaemia
Agriculture and Financial Inclusion	Access to Credit and Agriculture Pricing	Impact evaluation of access to credit in terms of household consumption and indebtedness
	Adoption Process	Access to credit and women's participation in household decision-making
	Climate Change	Farmers' willingness to adopt hybrid seeds
	Role of Technology	Impact of technology transfer and climate change on unskilled agriculture labour force, and relationship with economic growth
		Impact of technology transfer on agriculture productivity and unemployment
		The effectiveness of the "aquifer storage and recovery (ASR)" technologies for converging agriculture and drinking water solutions in southern Bihar
	Cost Effectiveness	Factors affecting farmers' choice with regard to finance and technology adoption and Assessment of Agriculture Value Chain
	Crop Insurance	Low financial literacy and its impact on index crop insurance
	Farm	Impact of relief programmes on welfare and productivity; How do these programmes affect investment decision?; Welfare impact of farm technologies on smallholders
	ICT and Technology Policy + Regulation	Technology, consumption patterns, and risk and relationship with income
Health, Nutrition, and Sanitation	Cash Transfers	Determinants of product take-up by smallholders
	Community Platforms and Participation	APMC Act
	Community-based Health Insurance (CBHI)	The role of public policy - do crop insurance programmes provide better value for money for policymakers than post-disaster compensation schemes?
	Family Planning	Land Records Management System and its impact on the livelihood of the people and land security
	Health Financing	
	Health Policy Evaluation	
	Home and Facility Visits	Causality between cash transfer programmes and female schooling
	Mass Media and ICT	The impact of the female school stipend programme on enrolments and learning outcomes
	Menstrual Hygiene	Effect of community platforms on norms, attitudes, and behaviours (SRHR and contraception)
	Mental Health	The impact of CBHI on marginalised populations for better health outcomes
Migration		The effectiveness of family planning programmes for delaying pregnancy
	Nutrition - Stunting and Governance	Impact of state health insurance for reducing out-of-pocket expenses on healthcare
	Policy + Regulation	Health workers home visits and their effect on health outcomes; Health workers' qualification and health outcomes

VI. LIMITATIONS OF THE SCOPING

There may, of course, be several other research papers and sources of evidence on the priority sectors but for this paper, only peer-reviewed articles and impact evaluation studies have been captured. As stated earlier also, the team would like to emphasise that for this scoping paper, they didn't review any currently on-going research studies, research studies which will publish soon or any grey literature or working paper on the priority sectors. In this process,

it is possible that some issues were erroneously excluded at the title or abstract level and thus not screened at the full text level. In order to maintain the quality, the team only reviewed peer-reviewed articles. With regard to the evidence needs, this paper primarily relied on information provided by the stakeholders who are currently working in Bihar, and not thoroughly capturing the full scope of programming by smaller implementers, which may have biased the overall perception. Because of the number of additional stakeholders not captured, it may be that the reach of our networks is not fully representative of all implementers, policymakers, and experts in the priority sectors in the state.

VII. CONCLUSION

Furthermore, several articles and evaluation studies include inadequate descriptions around the context of the evaluation, the interventions, and associated theories of change. In areas for which there is already a sizable evidence base, the research is generally specific to a very particular context or topic and not able to provide broader critical insights. Hence, there are several opportunities for researchers to contribute new high-quality research, evaluating, for instance, the latest curricula. A wide range of qualitative and quantitative evidence is needed to help us understand the complexities and nuances of the effects of priority sectors' programming in Bihar. The importance of rigorous, well-designed and well-reported research and impact evaluation studies in the field cannot be over emphasised. Stakeholders want more nuanced evidence that focusses not just on whether a programme works, but which interventions are most effective, for whom, and at what cost.

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