BIG DATA FOR SUBSIDY MECHANISM

JITENDRA KUMAR
Associate Professor
Department of Statistics, Central University of Rajasthan
NH-8, Kishangarh, Ajmer, India

ABSTRACT

The government is liable to help every citizen for employability, minimum facilitation of livelihood and almost all countries have shown their concern for. There are several ways of helping the poor and weaker section of society as well as all resident of a community/area or whole population and one of them subsidy. All subsidy schemes have two objectives, to help the common man and to upgrade their economic and living status. These have several success and failure stories and need up-gradation at every actionable day to protect the frauds, minimize the financial burden to government and maximize the impact of schemes. The main objective of the present study is to assess the issues associated with government subsidies and proposing the solution from Big data, most accepted source of information in current information era. The study review the source of information which may be usable for the subsidy mechanism and scaled it through data driven technique which will be more transparent, democratic and recommend the more responsible governance system after assigning the stepwise monitoring and verification from the data.

KEYWORDS: *Big data, subsidy, economic burden, responsible governance, source of information (s)*

1. INTRODUCTION

India is committed to the welfare and development of its people of vulnerable sections as per Directive Principles of State Policy, Fundamental Rights and specific sections, viz., Articles 38, 39 and 46 in the Constitution of India, stands testimony to the commitment of the State to its people. India is diverse country but to maintain the diversities in respect to social and economical differences are main concern of the government. These are distressing regularly our cultural and political developments. After the independence government has started series of welfare programmes with the intention to integrate economic, social, institutional culture of the society but we are struggling to see the expected results in this. Therefore in due course, there is an urgent need to review the procedure facts of mechanism involved in the up-liftment of weaker sections of the society.

From the beginning of human history of history population divided in to two groups, one can afford their liability and others who cannot. Principles of equality, equal opportunity and equitable distribution of

wealth are aim of well administered society and its governments responsibility to protect the minimal provisions of a good life. Since the independence government of India has tried to prove itself as welfare state however there are social and economic inequality faced by as women, dalits, etc who are deprived of basic means of living. Government and planning institutions were well aware about these problems and India is describing as a "sovereign socialist secular democratic republic" by making two provisions one Fundamental Rights and the other as Directive Principles of State Policy.

Government of India has anticipated the process of governance to show the way to decrease social and economic inequalities and all constitutional and statutory agencies assigned to protect the entitlements of all marginalised groups and almost all bodies are failed to provide adequate support. This is not constitutional obligation of system but it is a basic human right, differences due to inherited caste system, gender and also wealth have affecting the society of this right. Widespread existence of social discrimination, untouchability, domestic violence, and atrocities against the weaker sections is major reason of the failure of the all welfare promises made to the marginalized people of this country (Planning Commission Report (2008). Expert group has noted that large section of people are angry and feel neurotic from the polity. Therefore they have shown the interest in this context to identify the causes of discontent and its state duty to answer them in a humane, caring and democratic way. The way of agitation are taking different forms and causing the problem to our administrative system.

Government is always concern about the need of common peoples in shaping their happiness and plan several schemes to help them. Since government of India's emphasis in development planning has remained on overall socio-cultural development including aspects like health, education, population control, political participation etc (Kumar (2013). Successes of schemes are depending on planning, implementation and evaluation which may be managed in better way if the data analytics will be utilize in proper way. Present era is information era where everyone is full of knowledge about their friends, society and leaders visa-versa. Therefore concerns and policies for poor's have taken many forms in India but history of poverty elevation programmes is littered with good intentions vastly exceeding actual outcomes. It is proven administrative culture that benefits of welfare schemes like subsidy can be maximised only when the distribution of schemes are transparent, well targeted, and suitably designed for effective implementation without any leakages (Jitendra and Vinod 2013) . This can be achieved by fair registration procedure, vigilant approval and real time inspection which is possible only through data driven approach by utilizing all related information.

2. BACKGROUND OF STUDY

The Task Force on Direct Transfer may be extended to other services with the integrated information and technical infrastructure for authentication with reduced leakage and diversion of subsidy fund (Nilekani, 2011). This system will transfer the benefits to the linked account may need various methods for identification of beneficiaries these sources may be from the government/non government data sources or from the open web pages. Defiantly these sources will capture the information from multiple sources and

the information will come in various format and structures also every time information may be changed because of changes on individual's location, interest etc. This can be managed only through the techniques and methodology of Big Data (Jitendra and Pattnaiak 2013).

Public Distribution System (PDS) system in India is envisaged to provide food to 65 million households (GOI, 2011e). This is suffering large leakages and diversions (GOI, 2005b) and also not reaching to the targeted beneficiaries similarly more than one third of kerosene subsidy is not reaching to the real beneficiary. This results because of lack of real time monitoring and interest of working hand.

MNREGA programme was started with the objective to provide employment of 100 days to all rural households. Main aim of this schemes is designed to benefit **should reach to people** all transparency and accountability measures through job cards and effective use of muster rolls, monitoring and implementation systems and regular social audits. Although these all protective measures we are not in position to quantify the leakage and other losses (Chauhan et al. 2009) where funds are diverted through ghost beneficiaries and inflated/ fake work records.

Primary education is the foundation stone of future thoughts and planning. Our government always advocate the welfare schemes to facilitate primary education in country. Under Sarva Shiksha Abhiyan (SSA) government pays for schooling facilities, teacher's salaries, textbooks and uniforms and under Mid day meals (MDM) provide nutritional food. These programs are encouraging to parents to enrol their children at school (GOI, 2010a). Primary education is the starting step of our next generation and may be learning milestone for our future. This is suffering fraud registration at school, corruption, duplication forgery (Probe (1998)). There were noted that few enrolments, who do not actually attend school, repetition of enrolment of children who are attending some school run by private bodies/organizations and get benefits from the government schools (Kumar and Rustagi (2010)). This may be because of government pressure about the enrolment ratio or opportunity to get additional allocations of food and other materials that can be siphoned out or to retain a teacher's post. During the financial years 2007-2008 conducted by the Centre for Planning, Monitoring and Evaluation (CPME, August 2008) in 19 districts of Orissa found only 61% claimed wages were received by actual beneficiary where as muster rolls rejected 8.6% ghost beneficiaries and 23.1% days. Similar problems had been identified to other stats in respective audit Dhuru, (2007), Jharkhand (CDE, 2007b) and Chhatisgarh (CDE, 2007a)

Indian economy is termed as agriculture economy and maximum people are directly/indirectly dependent on agriculture. Taking account of this fact, governments has strong favouritism to provide the fertilizers to farmers in subsides rates and allotted Rs 65,972 crore in fanatical year 2013-2014(Planning Commission Data book 2013, 2014). Main drawback in subsidized fertilizer distribution that we are not having the mechanism for identifying and authenticating the individual farmers who receive these fertilisers which is offering the place for diverting subsidized fertilisers towards non-agricultural uses and also for black marketing in case of less availability. Similarly there was revised expenditure of Rs 96,880 in financial years

2012-2013 and allocated budget of Rs 65000 crore then financial years 2013-2014 on petroleum subsidy. Government is facing political dilemma in realizing the subsidy such as policy decision that the cap on number of subsidized cylinder and there are several examples were subsided cylinder used for commercial purpose and institutions are using the individual LPG for their routine work (TERI and IISD, 2012). In this respect we are also losing the comprehensive study to evaluate the re-diversion of benefits and resources are allocated for LPG subsidy and percentage of leakage and diversion.

With huge assigned budget along with numerous schemes and programs located at different administering agencies are not accepting the collective failure and also not screening the success. However there are few evaluation studies, reviewed individual schemes as per interest of individual, institutional or funding bodies. These discuss about the leakage, corruption causing systematic failure in the program implementation. This argument asks for reinventing the governance process for subsidy mechanism. It is well disputed that the strategies are associated with the welfare schemes are in operation directly/indirectly since the first five years plan but still they could not influence all the worried in it's right perspective. It is well known fact that lack of effective monitoring is major contributor of this failure. Therefore there is an urgent need of review and comparative analysis of existing schemes with intension of futuristic evaluation. Which can be managed only by data driven technique and Big data solution may be the best option. This may give us better governance for identification of beneficiary, in interoperation need and benefits through Big Data solution.

3. CLASSIFICATION OF SUBSIDY

Indian democracy is full of welfare ideas and planning regularly at several places. These are influenced by political, institutional and individual thoughts, which results the huge number of subsidy schemes designed in respective situation. All schemes may classify in respect to categorisation of India citizen as per their demographic, geographic, social and political origin. In addition of these, schemes may be classified as per governance procedure, implementation mechanism and also mode of receipt of welfare funds. There are several approaches of classification but the classification in respect to distribution and targeted mechanism in four groups are given groups:

3.1. **Subsidy for all:** Government of India is liable to provide minimum support to all Indian residents and planned several schemes which are benefitting to all. For example oil subsidy, interest subsidy on housing loan, education loan. etc

3.2. **Subsidy for all Marginalized people:** These are availed by a specific group, eligibility is defined based on the economic and regional backwardness like schemes are supported under rural development mission, fertilizer subsidy tax exemption for specific industry etc.

3.3. **Subsidy specific group:** These are planned for majorly disadvantages group in India like SC, ST or OBC. Planning of this kind of welfare schemes are due to backwardness of group and entitlement are not violated by any organisation, ministry but the diversion of the schemes are not possible to other classes.

3.4. **Subsidy Schemes for subsection of specific group:** There are few welfare schemes are designed for specific section of defined group like schemes for the benefits of sffai karmchary schemes etc.

4. BIG DATA FOR SUBSIDY

In social services and at the time of bearing responsibility to help the beneficiaries, first task is to identify the individuals who may be allowed to get the benefits like subsidy. There are classical way of identification i.e. region, religion, caste etc where masses are under hardship of life and second how long government should continue in helping the concern through subsidy and other welfare schemes. In present system of governance, especially in India, we are not much equipped to handle these tasks. In history, social services were more centric about the welfare of specific peoples because cost was born by some individuals but when this became government welfare activity of a democratic country then few peoples who are not eligible has applied for benefits. In practice this was/is controlled by administrative setup only but this became a tedious task because of numerous schemes and huge number of beneficiary. Individual oriented governance procedure needs power balance and no one want to interrupt other even do not believe in questioning the governance procedure. Therefore a hidden misuse of government's subsidies is indirectly promoted by everyone.

It is well established administrative concept in administration that transparency and strong relationship between beneficiary and government enhances the citizen's satisfaction. Therefore government may think to have all information in respect to their beneficiary of respective schemes then monitoring of fraudulent activity with the evaluation of performance of existing scheme(s). Since few year, current era named as information era and everyone is equipped with computer and IT tools and they started collecting information as per their concern not only personal also social and governance data hence become full of knowledge about system, society and government. In these days government/organizations are more concern about the choice and satisfaction of their concern and started collecting data from the time of birth to death. At every step, we are having multiple set of information which may be gathered at multiple places and these may be utilized through well established data driven decision process which is more productive in comparison to the traditional procedure (Brynjolfsson (2011).

Government of India is collecting several types of data like census, death and birth register, family register, data of income tax department etc. These all are having data of common man and shape certain type of big data for social services which give us raw data for planning of welfare scheme and identification of beneficiary and also for comparative analysis and futuristic evaluation of scheme. This will start new way of organizational culture, where the information may be stored in respect to need and relation at a data warehouse within organization from multiple sources are associated from all means of source are responsible to generators/generating. Obviously, this will be growing in exponential form. This explosion will facilitated to the administrator by an information hub called Big Data which is defined "*Big data refers to datasets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze*" McKinsey quarterly report (2011). As this may become source of information name Big Data for

subsidy mechanism for planning and evaluation of subsidy mechanism and this is right time for researchers and government to implementation in subsidy mechanism.

5. PROPOSED MECHANISM

Our existing mechanism for distributing of welfare from government sources, major hurdles initiated at policy level where everyone is talking about the benefits of respective section but no one is sharing the information in respect to eligibility of beneficiary or success of the scheme. In recent days there is satisfactory increase on awareness about the government schemes only for those who belongs higher income group or who are social and politically strong. There is still a group, who are not aware about their right due to their backwardness on education and fears imposed by local political culture in their mindset.

Present era is information era and everyone is full of knowledge about the system, society and individuals. There are several government's initiatives to equip the concern and provide the information for transparent governance procedure like Bhulekh is providing the information about the farming land, birth and death register is providing the demographic information, expenditure and demand in respect to the respective schemes are provided in different ministry and union budget website. This is right time to integrate the related information available with us for participatory and non-participatory policy starting from planning to renewal of the policy. There should be clearly defined liabilities and responsibilities of institutions and officers are involved in planning, implementation and renewal of schemes. Similarly the beneficiary should be honest and follow the welfare schemes objective and try to achieve the benefits as per objectives of the welfare schemes and also help government and distribution institution for transparent administration.

This is right time for our researches and government to take-care the procedural lacuna and come forward with solutions which will be self guided and transparent. There is an urgent need of policy reengineering through data driven techniques. Subsidy schemes will be governed through data driven techniques, where at the planning time of schemes, whole population will be analyzed with the available information and then segment the most disadvantages group in respect to targeted variable. This will be very critical issue and the marginalized section never be with the majority and also be identified from the all sections of the society based on demographic, geographical, family wealth and health, parents education etc. All sections of society will be identified and then existing scheme, which can help to the identified section also be identified and according benefits will be transferred to the beneficiary. Second, monitoring and renewal of schemes as per social and political thoughts include collective performance analysis with transparent manner and also with well administered system of evaluation of beneficiary and scheme. This need that some critical issues of entire mechanism should be addressed as listed below:

5.1. KNOW YOUR BENEFICIARY:

At the time of planning of a policy, it must be scientifically explained that who will be beneficiary of proposed schemes and then what will be duties of beneficiary with scientific vigilance procedure for

monitoring of institutions and officers are therein. Pre defined punishment procedure under fast track court with specific time lines must be incorporated. Similarly recovery of government money will be guaranteed before starting the new mechanism.

5.2. SELF MONITORED REGISTRATION AND TRANSPARENT IMPLEMENTATION:

Existing welfare schemes are mainly planned with specific subjectively and there are too much intervention of officers. They are managing the welfare schemes in autocratic manner with the objectives of democratic definition. In our earlier study (Jitendra and Vinod (2013) proposed four steps of Cash subsidy mechanism, may be implement through self monitored system under which beneficiary will request for benefits. List of registered beneficiary with all associated information will be displayed to all for transparent administrative system with real time analysis of eligibility.

5.3. PERFORMANCE OF WELFARE SCHEMES:

This is most important issue which is rarely addressed by existing mechanism of the welfare schemes. At the time of planning, coverage and performance is more influenced by political ambitions of the ruling party. Welfare schemes may be politically analysed but cannot be planned with the ambitions of some peoples and short term benefits because of it's impact on next generation. These should be formulated as a tool of society which could be in position to transfer the benefits to the targeted group and also timely renew to other group of society.

5.4. RENEWAL OF THE POLICY:

Any institution cannot survive on one way expenditure and government is an institution framed by a well defined constitutional system. All expenditure of welfare schemes are incurred by the government. If these will continue, definitely one day government may not be in position to help the concern due to the lack of money, so there will be fair renewal procedure with the objectives: (i) beneficiary need more time to uplift himself/herself, (ii) s/he made honest efforts to come out from the situation and (iii) person who improve himself should be awarded as best performer of the domain. By these objectives renewal of scheme must be implemented to develop two way subsidy mechanisms.

6. PROPOSED QUANTITATIVE APPROACH OF SUBSIDY

In view of the above the point as discussed in present study may be pertain through the proposed quantitative approach which is fully data driven. The eligibly amount and length of subsidy is decided based on data in a centrally shared system between different departments/organisation. This will be self monitored through software tools with honest and transparent administration as per citizen's charter.

In subsidy mechanism, there are several welfare schemes where individuals are getting benefits. Here, the schemes and individuals are periodically analysed. Let X is score of all individuals are belonging in particular group and receiving government and non-government benefits of social services. It is assigned in respect to all variables, affecting the status of individuals in respect to the variable under criterion of

marginalization of community. This will be defined based on the available demographic, geographic, social, economic and family information are listed in table given below:

Information Matrix for Welfare Schemes
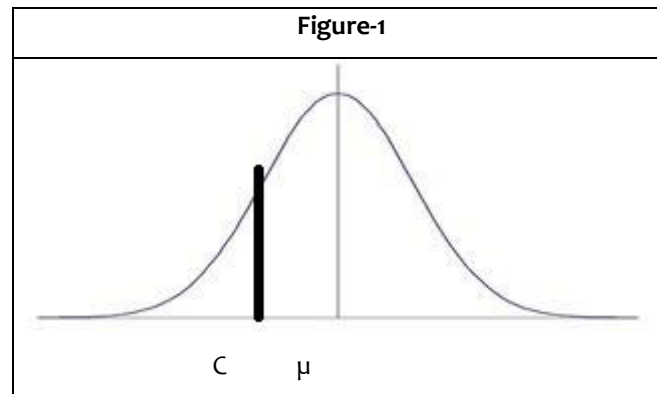
		Scheme-1	Scheme-2	---------	----	Scheme K
	Name					
Individual	Date of Birth					
	Mother's Name					
	Father's Name					
Family	Size of family					
	Income of family					
	Name of head of family					
	Number of dependents					
Special Group	Social category in India					
	Social Category in state					
	Local category if any for specific demand					
Economic/ Income from	Father					
	Property					
	Agriculture					
	Self-employment					
	Government subsidy					
	Non-government subsidies					
	Employment					
Geographic	Native place					
	Family residence					
	Present Residence					
	Places residing when get subsidy					
	Employer Address					
	Migration detail if any					
Health	Family member are suffering disease					
	Ongoing helps					
	Programs under taken					
	History					
Other	Additional Information from Population Register					
	Census					
	Local Administration					
	Adhar					

In existing scenario, it is defined based on the subjective decision of officiating policy document. Proposed scheme is defining new mechanism in which budget is given by the community. Whole population is divided into to two groups, who is eligible to become the part of targeted group and not. Then the distribution on score of whole population is fitted and estimated the parameters accordingly. Let total

money allotted to the budget is M and the income of an individual is x_i , here total possible support is M defiantly we will provide the support of individual/family belonging in lower tail of given figure ie $x_i < C$ and

$$\sum_{i=1}^{n}(C - x_i) \le M$$, here n is total number of individual/families are receiving the subsidies.

Figure-1

It is normal practices in mechanism of distribution of subsidy, we support everyone belonging in the marginalized group but in proposed mechanism to support and recipient of schemes are decided based on data driven approach where amount of help through the subsidy will be $(C - x_i)$ for i^{th} individual and

number of beneficiary *n* will be under the condition $\sum_{i=1}^{n}(C - x_i) = M$

However, there are several individuals/ families are belonging in the category, all persons are satisfying above condition only be eligible for a specified period to get the benefits. Theses beneficiary will be evaluated on all dimension of society in consideration of overall scenario of the targeted group and then performance of the subsidy will be evaluated. Evaluation of beneficiary will be critically performed with the other parameters of society and then renewal and success of schemes will be recognised with reference of these in time.

As fund of any country has limited funds and any welfare scheme cannot be allotted all. Optimum use of fund should be recommended based on the data and subjectivity of rest community. Group of individuals, families or beneficiary may be benefitted whole and the comparative analysis with same score is performed and then coupled it with the rest of individuals are belonging in targeted group and prediction of policy life is required for continuation of policy. This may be continued till scheme is perform effectively and also level of all individuals/families belonging in the group are homogeneous and also competing with national constants. The performance of scheme may be categorising in following groups.

6.1. NO CHANGE ON BENEFICIARY GROUP:

After implementation of schemes it is recorded that there are no change on associated group of beneficiary. This may be possible due to wrong planning or ineffective implementation schemes or undue interest of individuals/institutions. Here, this may be challenges for the governing institutions who do not

want to recommend the policy. This should be analysed with some more corrective measures and also by indentifying the interest concern institutions are involved therein.

6.2. SHIFT OF WHOLE GROUP:

Progressive parameters are always dependent on basic availability. As individual and groups are already having minimum support by their own sources and they may achieve the same progress are required at the specified period and also weaker section got help through subsidy schemes, they also progressed themselves up to satisfactory level. This shift is a good sign for the government and also subsidy should be recommended up to the achievement of national and international parameters. Here, policy may add one more feature after completing the level at national level for peoples belonging in other category beyond the targeted group may be included for benefits. This policy be the great success of community because it is becoming the regular progress under the targeted causes and not effective negatively to other group.

6.3. PROGRESS ON BENEFICIARY BUT DECLINE ON REST GROUP:

Under proposed scheme, segmentation of targeted group into to two groups first who are getting benefits and second not. Here, separate analysis of both groups will be done and if there are progress only on beneficiary but those who are not receiving benefits are declining. This will be most harassing situation for government or governing institutions. This situation will be examined with two objectives, first decline on second group is impact of welfare scheme or not if yes immediately policy should be stopped. If this happens because of other parameters like natural and routine changes of the community, schemes will be extended to those, who have not received the benefits and it should be continued with the objective that no one may loos their progress.

6.4. NO SHIFT ON BOTH GROUPS:

Last possibility may be there that there is no change on the level of beneficiary and non-beneficiary group. This may be because of minimum support are required to the individuals and institutions may think to extend the benefits or if this be because of performance of the policy. The scheme may be immediately stopped.

7. HURDLES WITH THE PROPOSED MECHANISM

7.1. DATA AVAILABILITY:

Social welfare schemes like subsidy is always started to give the benefits for those, who are not able to occupy the minimum facility for their livelihood. This segregates a population and accordingly it owned by a ministry or dealing government department. Government's IT initiatives are collecting reference data as required or asked by administrator and structure of data may be entirely different from other. There are several peoples who are entitled for getting multiple schemes of different objectives. So compilation and use of other cannot be entertained easily because different forms and structure. In the proposed mechanism, analysis for planning purpose are based on the existing schemes information and which can be implemented only if Big Data for subsidy mechanism is taken place.

7.2. LACK OF AUTOMATED TOOLS:

Main struggle in subsidy mechanism through Big data is to convert the available data in required format and then for later analysis. There are several researchers/software companies are taking challenges about the storage, utilizing the past data after compiling with present data (white paper titled "Challenges and Opportunities with Big Data). Definitely it will provide more authentic representation of population and also transparent governance because of data driven techniques.

7.3. METHODOLOGY FOR MODELLING AND EVALUATION:

Major challenge in handling the subsidy mechanism for the government and researchers to transfer the content available from all government and non-government sources for the subsidy related analytics and administration. Accordingly it is required to develop the solution and model which should be equipped with real time analyser facility.

7.4. POLITICAL WILLINGNESS:

In democratic mechanism of ruling, ruled by the group/individual are having maximum peoples support. Social services and subsidy is a very soft targeted tool for manipulating the peoples and getting the support. As the number of subsidized cylinder for home use is facing political dilemma and till today because of loss of public management. Therefore implementation of data decision can be realized only if there is political willingness with the data decision. Proposed mechanism and these can be managed with political willingness.

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