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RESEARCH ARTICLE

RELATIONSHIP BETWEEN USE OF HERBICIDES AND MGNREGA IN INDIA

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ABSTRACT

Herbicide is just a category of pesticide. Pesticide is used to rid an area of unwanted pests while herbicide is used to get rid of unwanted plant life, like weeds, brush, unproductive bushes or trees, and other growth that takes nutrients away from crops and other useful plants. History shows that in industrialising countries in the past, including United States, Germany, Japan and South Korea, the same phenomena have occurred as workers have left agriculture and herbicides have been adopted. The objective of this research paper is to evaluate the relationship between use of herbicides and shortages of labour and cost effectiveness of herbicides in India after launching MGNREGA. Uses of herbicides are increasingly being adopted around the world as a substitute of weed management labour. Generally MGNREGA provides 100 day wage employment in a year to every rural household who is ready to do unskilled manual work. This unique feature of the programme has not only provides job to labour having no employment but also the labours working earlier in the agriculture fields. After coming of MGNREGA in 2006 Indian agriculture sector is suffering from two major problems that is shortage of labour and high wage rate. Therefore use of herbicides in India is being rapidly adopted. It is interesting to note that the real farm wages increased by 3.7 percent p.a. during 1990s compared to only 2.1 percent p.a. during 2000s and then rapidly rising by 6.8 percent p.a. during 2007-08 to 2011-12 in India. Due to MGNREGA raises the real wage rate of unskilled worker by 20 percent, create 70 million new work opportunities. FAO data shows that the use of herbicides has moved up from 2121.66 tonnes in the 2008 to 6334.98 tonnes in 2010. This shows use of herbicides has increased significantly after MGNREGA due to shortage of labour and cost effectiveness.

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INTRODUCTION

Herbicides are available in two main types: nonselective and selective. The nonselective variety is used to kill all growth and is generally reserved for agricultural use or for clearing large or heavily overgrown areas. On the other hand, a selective herbicide is used to target certain types of plant life. This form works to curb growth, usually through some type of hormone disruption, and should not affect other vegetation. The use of herbicides is being increasingly adopted around the word. Many developing countries (India, China, Bangladesh) are facing problem shortage of workers. To hand weed fields as millions of people move from rural to urban areas. In these countries, herbicides are far cheaper and more readily available than labour for hand weeding. History shows that in industrialising countries in the past, including united states, Germany, Japan and South Korea, the same phenomena have occurred as workers have left agriculture and herbicides have been adopted.

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The use of herbicide is increasing in the world wide in crop production. The value of the worldwide herbicide market grew by 39% between 2002 and 2011 and is projected to grow by another 11 by 2016 (Philips, July, 2013). Herbicides are being rapidly adopted in developing countries that face shortage of hand weeding labour and the need to raise crop yields (Zhang, 2003, China). Improved weed control with herbicides has the potential to improve crop yields in many developing countries (Masthan, Reddy and Rao, 1989).

Hand weeding never has been a very efficient method of weed control because its take much time which are not enough to weed control. While the use of herbicides is quickly affect to improved weed control therefore it is a effective methods of weed control and their use contributed significantly to increased crop yields. In the united States, increased use of herbicides accounted for 20 percent increase in corn yields and 62 percent increase in Soybean yields from 1964 to 1979(Kim, Schroder, Headley and Finley,1981). The use of herbicides has been identified as a main factor for increasing wheat yields in Canada since the 1960s. The use of herbicides

in all three cereals rice, wheat and maize has grown as rising agricultural wages it means there is direct relationship between rising agriculture wage and use of herbicides, the result of increasing off-farm employment opportunities, have reduced the cost-effectiveness of hand weeding (Naylor 1997 and FAO). Asian crop fields have been incurring yields losses due to inadequate weeding. A 1991-1995 survey of rice fields in tropical Asia determined that uncontrolled weed in farmers' fields were the most significant pest factor in reducing yields (Salonen, Hyvonen, Kaseva and Jalli, 2012). 1The one uncertainty for the future of chemical use is herbicides. Adequate nonchemical controls for weeds are not yet available, and herbicide use is increasing dramatically as a result of rising opportunity costs of labour across the developing world.

With the introduction of higher-yielding varieties of wheat responsive to intensive irrigation and fertiliser application, wheat production in India and Pakistan increased dramatically. However there is wide gap between potential yields of wheat and yields obtained in farmers' fields (Singh and Varshney, 2010). Weed infestation is the main cause of low wheat yields in Pakistan and India and is reported to reduced wheat production by 25 to 30% (Anjum, Bajwa, 1993). To hand weed India's crop fields adequately approximately 9 billion person-days of labour would be required. In reality, hand weeding in India has been inadequate and crop losses have resulted. In one regional survey, between 15% and 30% of the fields all major crops were never hand weeded. A little less than half the fields were hand weeded once.

More than 40 percent of the Fields were hand weeded for the first time after the critical first 36 days after sowing. Recent Indian Government programme such as MNREGA has created labour shortage and high rate of wage for weeding in India4. The MGNREGA provides guarantee of 100-day wage employment in a year to every rural household who is ready to do unskilled manual work. This unique feature of the programme has absorbed not only the labour having no employment but also the labourers working earlier in the agricultural fields, making it difficult for the farmers to carry out agricultural operations. Implementation of MGNERGA works has led to labour scarcity to the tune of 53 per cent and 30 per cent for agriculture operations like weeding and sowing, respectively.

A survey conducted in Dry Zone of Karnataka show that for sowing of sunflower, 2.8 person-days of labour was required per acre, while the labour availability before MGNREGA implementation was 1.9 of person-days, with a labour scarcity of 32.14 per cent. With the implementation of the Program, the labour availability was of 0.3 person days only, which led to acute labour scarcity of 89.29 per cent. Thus, the absolute scarcity due to MGNREGA was of 57.14 per cent. Absolute scarcity due to MGNREGA was worked out in a similar manner across seasons for different crops (Chengappa and Basavaraj, 2011). It is interesting to note that the real farm wages increased by 3.7 percent p.a. during 1990s compared to only 2.1 percent p.a. during 2000s and then rapidly rising by 6.8 percent p.a. during 2007-08 to 2011-12 in India. The raising the real wage rate of unskilled workers by 20 per cent and creating 70 million new work opportunities (http://nrega.nic.in/call paper.pdf).

Thus, in the in the recent years a shortage of labour has been occurring on rural farms. Until recently in India, herbicides were used on 10% of the wheat hectare to control grass weed species45. Since 2005, the value of the herbicide market in India has doubled1. The Indian market for herbicides is expected to grow about 40% annually over the next five years46. 2...With the rising costs and shortage of labour, farmers are inclined to use herbicides which are cheaper and more economical (compared to manual weeding)," said M.K. Dhanuka, Managing Director, Dhanuka Agritech. The company has seen its herbicide sales almost double in the past five years and now account for a third of its overall sales. Dhanuka earns more than Rs. 100 crore from Targa Super alone, a proprietary herbicide belonging to Nissan Chemicals, which it distributes in India.

Brief history about MGNREGA

Mahatma Gandhi NREGA was launched in 200 select districts on 2.2.2006 and was extended to 130 additional districts during 2007-08. All the remaining rural areas in the country have been covered under the Act w.e.f. 1.4.2008. Presently, Mahatma Gandhi NREGA is being implemented in all the notified rural areas of the country. Mahatma Gandhi NREGA seeks to enhance the livelihood security of the households in rural areas of the country by providing at least 100 days of guaranteed wage employment in every financial year to every household whose adult members volunteer to do unskilled manual work. To augment wage employment opportunities by providing employment on demand and thereby extend a security net to the people and simultaneously create durable assets to alleviate some aspects of poverty and address the issue of development in the rural areas.

Problem of the Study

Based on above conceptual background we have opted the problem of the present study work entitled on "Relationship between Use of Herbicides and MGNREGA in India"

Aims and Hypothesis

This study is targeted for the following Aims and Hypothesis:

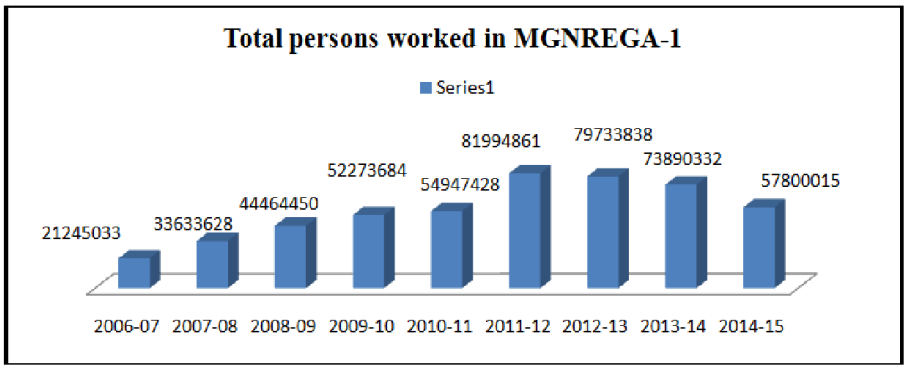
AIM-1.To evaluate relationship between use of herbicides and MGNREGA.
H1.There is inverse relationship between use of herbicides and MGNREGA.
AIM-2. Evaluate the effect of MGNREGA on Wage rate.
H2. MGNREGA has increased wage rate in Agriculture sector.

Data Analysis

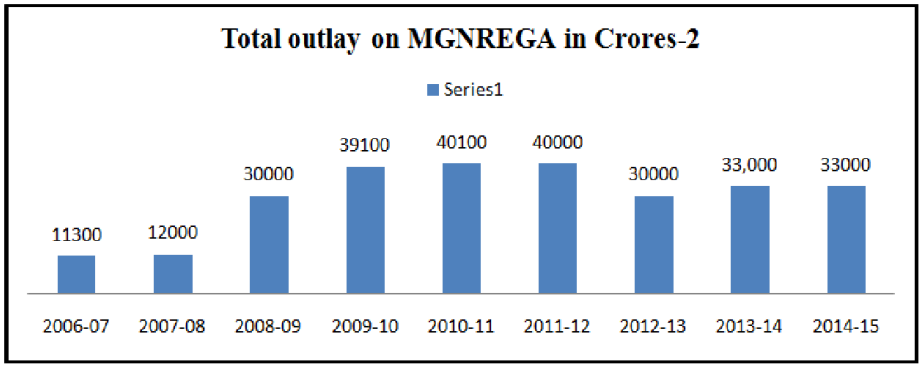
Average use of herbicides in Indian agriculture is recorded for the year 6193.41 tonnes. Maximum use of herbicides is recorded 7500 tonnes for the year 2003 followed by 3574.67 minimum in 2008.Total quantity of use herbicides during 1990-2014 have recorded 123868.29 tonnes. Standard deviation is recorded 1194.20 for these data. After coming

MGNREGA in 2006 use of herbicides were recorded 6304 tonnes while it were recorded maximum 7500 tonnes in 2003 followed by 5154 in 2004, 6959 in 2005 and 6304 tonnes in 2006.

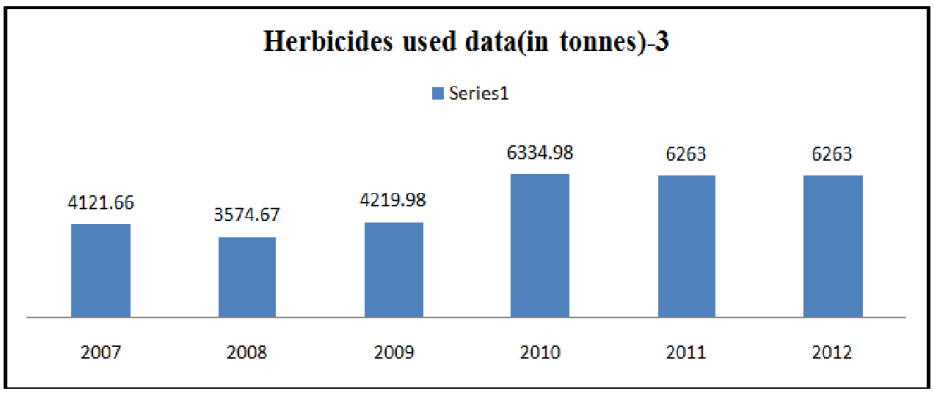
All the remaining rural areas in the country have been covered under the Act w.e.f. 1.4.2008. Presently, Mahatma Gandhi NREGA is being implemented in all the notified rural areas of the country.



Source: MGNREGA, Government of India



Source: MGNREGA, Government of India



Source: Food and Agriculture organization

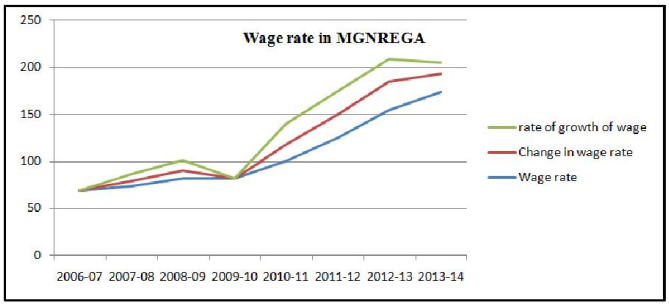
Year	Wage rate in MGNREGA	Change in wage rate	Growth rate
2006-07	69	-	-
2007-08	74	5	7.24
2008-09	82	8	10.81
2009-10	82	0	0
2010-11	100	18	21.95
2011-12	125	25	25
2012-13	155	30	24
2013-14	174	19	12.25

Source: MGNREGA, Government of India

It means it has decreased from 7500 tonnes in 2003 to 6304 tonnes in 2006. It point to be noted Mahatma Gandhi NREGA was launched only in 200 select districts on 2.2.2006 and was extended to 130 additional districts during 2007-08.

One more thing here should explain that is Cob-Web model that may occur in this case. When goods take a time to produce, there will be a time lag between a change in production decisions and a change in the actual supply coming

on to the market. Thus the actual supply at one time will depend on that planned at a previous time. For example, the quantity that farmers harvest now will depend on what they planted earlier.



Since supply decisions depend on price, supply at any time will depend on price at a previous time. On the basis of theory and literature it may be say there is a time lag in substitution between use of herbicides and labour engaged in agriculture. As above mention in all rural areas in the country have been covered under MGNREGA in 2008. Mahatma Gandhi NREGA seeks to enhance the livelihood security of the households in rural areas of the country by providing at least 100 days of guaranteed wage employment in every financial year to every household whose adult members volunteer to do unskilled manual work. Because of that it creates problem of high rate of wage and shortage of labour for the agriculture sector.

In 2008 herbicides were used 3574.66 tonnes and persons involved in MGNREGA 44464450 and in 2010 use of herbicides were recorded 6334.98 tonnes and worker move up to 81994861 in 2011-12. It means there is significant direct relationship between use of herbicides and worker involved in MGNREGA. In 2011 use of herbicides were recorded 6263 tonnes and persons involved on MGNREGA 79733838. Maximum persons involved in this scheme was recorded in 2011-12 81994861 after that it is being fall. As for after 2011 use of herbicides are concerned in 2012 herbicides have used 6263 tonnes and in 2014 is recorded 5000 tonnes. These data shown as persons involved in MGNREGA are fallen, use of herbicides are being decrease. Total budgetary expenditure on MGNREGA is a major factor which reducing persons involvement from MGNREGA. Maximum total outlay for this scheme was recorded 40100 crores in 2010-11 followed by 40000 in budget 2011-12, 30000 in 2012-13, 33000 in 2013-14 and 33000 in 2014-15. Despite all budgetary allocation has not been expanding.

The State government issued an order hiking the wage per day from Rs. 155 to Rs. 174, an increase of 12.25 per cent. With this revision, the wage rates have been revised seven times since the launch of the job scheme in 2006-07 by the United Progressive Alliance (UPA-A) government. Wage rate for MGNREGA worker in 2006-20047 was Rs. 69 followed by Rs.74 in 2007-08, Rs.82 in 2008-09, Rs.100 in 2010-11, Rs.125 in 2011-12, Rs.155 in 2012-13 and Rs.174 in 2013-14. These results are shown, wage rate in this scheme is continues increasing. Maximum positive change in wage rate among these year is recorded in 2012-13 and minimum in 2007-08. Growth rate of wage rate was recorded maximum 25 percent in year 2011-12 followed by 24 percent in 2012-13, 21.95 percent in 2010-11 and 12.25 percent in 2013-14.

Conclusion

As per the findings of this paper pointed out that schemes like MGNREGA are affecting labours adversely and Use of herbicides is being adopted. That is show importance of herbicides in Indian need immediate policy interventions. Table.1 represent 21245033 people were involved in 2006-07 and it was just move up to 81994861 in the year 2011-12. On other way Food and agriculture Organisation are showing 3574.67 tons in 2008 and it was move to 6263 tons in 2012. This point to be noted when person involved in MGNREGA was move up to 81994861 in the year 2011-12 then use of herbicides was also move up to 6263 tons in 2012. That is show there is direct relationship between use of herbicides in agriculture and persons involving in MGNREGA. It is very logical to predict when worker those were involved in agriculture but after launching MGNREGA they are moving to MNREGA. Then farmers have one alternate to use herbicides for weed management. It is important to explain. Worker who involved in agriculture farming process, much proportion of these labour have involved for weed management and herbicides are also be used for weed management.

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