

Employment Guarantee and Its Environmental Impact: Are the Claims Valid?

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This note questions some of the assumptions, fundamental concepts and methodologies in “MGNREGA for Environmental Service Enhancement and Vulnerability Reduction: Rapid Appraisal in Chitradurga District, Karnataka” (EPW, 14 May 2011), arguing that the analysis in the paper does not support the authors’ claims of multiple benefits from the Mahatma Gandhi National Rural Employment Guarantee Act.

This note is in response to the paper by Tiwari et al (EPW, 14 May 2011). As many as 14 researchers worked to find out the vulnerability reduction through the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in the Chitradurga district of Karnataka. The paper makes claims about the environmental and vulnerability reduction impacts of the NREGA, based on limited empirical data, faulty assumptions and unsound methodologies. The findings are a priori. The methodology adopted is rapid scientific appraisal, a clone of rapid rural appraisal. The methods no doubt have immense value when properly attempted and analysed using participant observation. Qualitative research calls for a more rigorous methodology than quantitative methods to avoid the usual pitfalls which are endemic. The inherent danger is that instead of appraising, the researchers may fall into the trap of opinion surveys and narration of perceptions.

There seem to be some fundamental problems in the understanding of the term “environmental services” (Tables 2 and 3, p 41). Increased water availability for irrigation, increased agricultural production and yields, and improved storage capacity, which the authors show as the impacts of the NREGA, do not qualify as environmental services. Globally, regions affected by water scarcity are those where large quantities of water are diverted for irrigation (Kumar et al 2010). Likewise, increase in irrigated area also does not qualify as environmental service.

Assumptions, Concepts, Methods

The assumptions used at several places in Table 5 (p 43) would have led to serious bias in outcomes. Some such examples are: rainfall variability assumed to be least for

groundwater level measurements; increased irrigated area by bore-wells for estimating increase in area under irrigation; maximum work can be provided each year for additional income calculation; and best of three-year performance for work availability. For instance, groundwater levels in hard rock areas of peninsular India fluctuate widely between years, depending on the magnitude of rainfall, which according to the authors’ own data, varies from year to year. Further, the contribution of surface water bodies such as tanks to total irrigation is very high in peninsular India during good rainfall years.

The development of vulnerability indices leaves a lot to our imagination. There is no clear-cut basis for the development of water, agriculture, and livelihood vulnerability indices, including the weightage assigned to the different indicators. If the stakeholder analysis was carried out, details should have been provided.

The paper does not adequately describe the hydrological model attempted. Though the positive impact of the NREGA on groundwater recharge is mentioned several times, the authors have not provided the methodology used to estimate the same. While participatory rural appraisal (PRA) and hydrological monitoring are supposed to have been used as indicators for measuring groundwater level and percolation, it is not specified how these data were used to arrive at recharge figures. So is the case with the estimation of loss of water through run-off (Table 4, p 42). Here again, authors have used hydrological modelling, but there is neither a description of the model nor the estimates.

Further, it is rather unusual to obtain water storage capacity of reservoirs, crop production and yield data only through focus group discussions (FGD) and key informant surveys (KIS) (Table 4, p 42). The argument that “increased storage capacity of the tank implies more water stored in tank and hence more recharge” will not hold true during deficit rainfall years. This can only happen in wet years. The authors’ own graph shows that this has happened only in two out of the last seven years.

The authors should clearly mention the specific water conservation and harvesting

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technologies used in the NREGA programme that resulted in groundwater recharge, soil moisture retention and protection, flood control, provision of irrigation and drinking water and nutrient recycling in the study villages (Table 3, p 41). The area that the authors are describing has extremely limited groundwater recharge potential and low to medium rainfall of poor reliability and high aridity.

The authors argue that check dam construction improves soil fertility in agricultural land. This is a long-standing myth, which needs to be dispelled. Likewise, it is not clear how planting tree saplings increase carbon sequestration, when there is no guarantee of the survival of the plants, given the semi-arid climate with 500 mm rainfall, compounded by high variability (Table 3, p 41). The planted trees, if they do survive, would end up consuming a lot of water (in the form of evapo-transpiration), and result in desiccation in semi-arid and arid regions.

Another contentious claim is that renovation of traditional water bodies such as tanks ensures groundwater recharge and increased water supplies for irrigation, without causing a proportional reduction in the flows into the downstream water bodies, given the fact that the area falls in the Krishna basin, which is on the verge of "closure". The authors also need to inform the readers how flood control structures ensure "groundwater recharge".

The methodology for measurement of groundwater levels (Section 4.1.1, p 44) is bound to yield inaccurate results. The levels were partially measured and partially collected based on FGD and KIS, and it is not clear which method was actually employed. Also, obtaining past records of groundwater levels from the central or state groundwater departments might have increased the scientific validity of the results.

The impacts of afforestation work are assessed on the basis of some standard

norms, and are not based on real time data. Considering that most of the plantations are less than three years old and undertaken in different time periods, calculations of biomass production, carbon sequestration and biodiesel production have no meaning. It is too early to consider the outputs from the plantations, as it would depend on how these are going to be managed and on the climatic variability. There is a greater risk of pest infestation as most of the plantations are grown as monoculture. Further, one seldom finds that the trees raised under community plantation activities show the type of growth or soil cover typical of natural forest ecosystems.

Problem of Attribution

The authors claim (and provide Figure 3 to back their point) that the post-NREGA groundwater levels showed a significant rise (around 113 m in one village) in the three villages. This is around 2,000 mm of

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recharge (for a specific yield of 0.02 for the aquifers underlying that area) for a rainfall of 500 mm! The authors should have mentioned what the pre-NREGA water levels refer to (i.e., whether it is pre-monsoon or post-monsoon) or whether they are just comparing pre-monsoon or post-monsoon water levels in wells, pre- and post-NREGA interventions, respectively. It is obvious that after the monsoon the water levels come up in the wells, and the rise is very high in hard rock areas even for a small amount of recharge, because of very low specific yield of the aquifer. The authors therefore should have found out the difference in (pre- and post-monsoon) water level fluctuation before and after the NREGA (in years of similar rainfall quantities), rather than simply compare pre- and post-monsoon water levels. The other option would have been to compare water level fluctuations in two areas in the same year, one with NREGA interventions and the other without NREGA interventions.

This problem of attribution is applicable to almost all the impact variables of the NREGA interventions, be it enhanced crop yield, increased water availability for irrigation, increase in crop area, productivity of agricultural land, increase in tank storage and improved soil moisture storage. The values of all these variables can improve with a good rainfall in a semi-arid region like Chitradurga, even without any of the NREGA interventions.

Environmental services and their improvements were assessed at the village level. The authors say, "No village showed any negative impact on vulnerability due to NREGA activities". Groundwater recharge, rainwater percolation, and ecological flows are not amenable for assessment village-wise. Further, it is now well recognised that basin should be the unit of analysis of the impacts of small water harvesting systems (Molle and Turrall 2004; Kumar et al 2006), more so in water-scarce regions due to negative externalities which upper water harvesting interventions induce on stream flows in the lower areas of river basins. Had the authors expanded their unit of analysis to include some of the downstream villages, many of the negative vulnerability impacts would have emerged.

Research in the recent past has questioned the claims of positive hydrological impacts, economic viability and ecological benefits of water harvesting and recharge (when looked at from a river basin perspective) in naturally water-scarce regions. However, the authors seem to have ignored these very crucial issues and have instead taken a few villages and wells as their unit of analysis even for groundwater assessment. There are enough evidences now to show that intensive water harvesting causes severe consequences for downstream areas in terms of reduced recharge and stream flows in water scarce regions/basins (Gujarat and Rajasthan) (Kumar et al 2008; Ray and Bijarnia 2006).

There is mounting evidence and criticism about the futility of the NREGA work and its welfare impacts (causing artificial scarcity of wage labour, etc), leave alone the issue of fund utilisation (Bassi and Kumar 2010; World Bank 2011). The latest report of the World Bank on 14 social protection programmes, including the NREGA, carried out for the Planning Commission, makes serious remarks about the poor quality of work carried out under the NREGA, relating to water harvesting and conservation, and the lack of scientific design and technical supervision. The report (2011:84) notes:

A key constraint to building high quality assets is the lack of technical support to communities as input to planning MGNREG works (e.g., through resource mapping exercises) as well as the shortage of technical staff in designing and supervising works. A large number of works, particularly those related to water conservation, remain incomplete, either due to lack of technical support to GPS or the onset of monsoons.

The paper does not mention any study contradicting the arguments put forth by the authors in favour of the NREGA.

Sweeping Conclusions

The paper uses terms and words sweepingly, without appropriate data to support them. The authors should have quantified the total economic benefits (considering the positive and negative externalities) against the investments made for the NREGA. Otherwise, it serves the purpose of echoing the views of the Planning Commission.

More explanation is required on how the income of individual farmer increased from zero to up to Rs 1 lakh/acre/year after the land development activities (p 46, para 2 (4.3)). For instance, what were the farmers doing when the farm income was nil? Authors state that the NREGA has reduced vulnerability by providing employment and income to rural communities. But no data on employment days created and additional income generated as a result of NREGA activities has been provided.

The conclusion that the NREGA will deliver the sustained multiple benefits (at the individual and community level) over the long run does not follow from the analysis carried out in the paper.

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