Durable Livelihood Assets: Impact Assessment of ASA's Dug Wells Programme

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Executive Summary

Overview

The Dug Wells' Programme (DWP) delivered by Action for Social Advancement (ASA) has been in operation since 1997. Over the last 10 years both financial and social benefits have been secured as a result of the programme. The objectives of the study here are to:

1. To assess the impact of dug wells on Farmers including:
    - Economic Impacts – particularly the Impact on agricultural patterns; and
    - Social Impacts – in particular, the impact on migration and education.
2. To understand what the role of a dug well is as a livelihood asset.

This report therefore highlights the successes of this programme and demonstrates the importance of a durable livelihood asset[1] to enable sustainable livelihoods for farmers' benefiting from programmes of this type.

1.1 Policy Context and Background

1.1.1 Introduction to ASA

ASA is an organisation conceived in 1995. It was formed by a group of development professionals with extensive grass roots experience of the development issues affecting Indian communities in the Madhya Pradesh region of India. Central to the organisation's aims is securing livelihood security of the poorest people in their region of operation; one of the most deprived areas in India. This goal is facilitated by an intensive participatory process of natural resource development and local institutional progression. This means that ASA works closely with people to assist them in developing in the direction the people themselves feel most appropriate. ASA continually improve their performance and capacity to deliver by monitoring their performance aiming to develop best means of practise for themselves and others in the field.

The organisation operates across 17 districts in Madhya Pradesh, has programmes in place in more than 800 villages and is estimated to be working with 400,000 people. The main programmes in operation included are:

- Community Based Natural Resources Management;
- Participatory Irrigation Management;
- Farming Systems Research and Development; and
- Micro Finance.

One part of the ASA's Community Based Natural Resource Management work is their DWP. This has been developed over the last 10 years by ASA and its partners, helping 596 farmers and their families in working their way towards sustainable lives.

1.1.2 The Dug Wells Programme

Introduction and Evolution

ASA's DWP began in 1997. It was based on the concept of providing a long term and self-sustainable solution to the poverty experienced by those poorest in society. This theory was grounded in the grassroots expertise of ASA field staff already working in this area of Madhya Pradesh.

The programme entails enabling the construction of a number of dug wells intended for the benefit of either a group of people or individual farmer. The wells are funded, in part by ASA and in part by the communities or individual beneficiary[2].

Dug wells are an efficient means of drawing off sub-surface water that can be used for irrigation purposes. During the 10 years this programme has been in operation, ASA has seen this lead to increased provision of subsistence crops as well as enabling farmers to grow crops throughout the entire year and experiment with new, potentially more profitable produce without posing risk to essential income generating crops.

[1] See Doward et al (2001)

[2] Participant contribution is dependant on the socio-economic category of the beneficiary.

In addition to these economic benefits; a number of consequent social benefits have been seen as a result of the DWP. These include:

- Individual ownership promoting innovation and an entrepreneurial spirit amongst farmers encouraging a cycle of prosperity;
- Reduced scope for conflict and social tension over water;
- Less dependency on Money Lenders and their associated problems; and
- Decreased need for economic migration.

Beginning in the Jhabua region of Madhya Pradesh; the programme has evolved to 2 additional regions installing 767 dug wells in total[3] At the same time as this programme extends, the benefits derived from its implementation continue to grow. The purpose of this paper is to illustrate the scale and scope of these benefits and how dug wells operate as livelihood assets.

Dug Wells as Livelihood Assets

The establishment of lasting livelihood assets rather than short-term solutions to poverty has evolved within the development sector over the last 30 years. Robert Chambers and Gordon Conway introduced the concept of "sustainable livelihoods" in 1992. This concept has since formed the basis for many of the programs of the UK Department for International Development (DFID) as well as being used by international development agencies to develop related polices and programs. Though there are debates surrounding the definition of this concept[4] DFID explain:

"A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain and enhance its capabilities and assets both now and in the future, while not undermining the natural resource base"[5].

The assets that communities have towards a sustainable livelihood can be divided in several different categories. Scoones[6] explain this as the distinction between "material and social, tangible and intangible assets that people have in their possession". According to Doward et al[7] (and their categorisation) dug wells fall within the physical productivity category. This is because of the increased productivity of land and other associated benefits, as a result of their construction.

[3] ASA, 2007
[4] See Carswell et al (1997:10) for detailed consideration of this definitional issue.
[5] DFID, 1999, in Power (2003:181)
[6] (1998:7)
[7] (2001)

The creation of such physical productivity assets is a particularly effective means of working against poverty in India where tribal communities often already own their own land. These people often only require support to maximise the assets they already have rather than help to gain assets in the first instance[8]. The research undertaken here demonstrates the exact impact this asset has had on the communities where ASA works, supporting the development and extension of programmes of this type.

1.1.3 Research Method

In line with ASA's learning-based approach to monitoring and evaluation, the progress of the DWP been continually observed both internally, by ASA staff, as well as externally by outside commentators and consultants[9]. This evolutionary approach towards development is advocated within the development sector[10].

The objectives of the study here were:

1. To assess the impact of dug wells on the farmers including:
    - Economic Impacts – particularly the Impact on agricultural patterns; and
    - Social Impacts – in particular, the impact on migration and education.
2. To understand what the role of a dug well is as a livelihood asset.

The research here was carried out between 1st November and 24th November 2007. Its method involved individual qualitative interviews with 50 dug well owners in 11 villages over 2 Districts of Madhya Pradesh. These were purposively selected, according to access, out of 596 possible well owners ASA have worked with since 1997. Those interviewed were distributed as follows:

[8] The land of tribal communities is protected well under Indian Law relative to other development contexts worldwide.
[9] For example, Down to Earth (July, 2002)
[10] Mondal and Dutta (2007) explain that a learning-based approach to monitoring and evaluation is pivitol to the development sector.

Name of District	Name of Village	No. of Well Owners Interviewed
Jhabua	Badi Sudi	10
	Kolyabeda	11
	Dedarwasa	4
	Dekakund	3
	Ratmaliya	2
	Kalapan	4
	KalaKhunt	6
Ratlam	Morwani	2
	Dantoda	2
	Ghodakheda	5
	Borda	1

The questionnaires provided information regarding farmers' economic and social position before and after being involved with the DWP (see Appendix A for questionnaire format). Analysis therefore draws upon the improvement in situation for farmers. The following section details the improvements demonstrated in this research as a result of the DWP.

1.1.4 Emerging Findings

A number of economic and social improvements as a result of the DWP are evident in the findings of this research. The scale of these impacts as well as the implications for communities' livelihoods are presented below.

1.1.4.1 Economic Impacts

The scale of ASA's DWP is demonstrated in the increase in number of assets as well as the effects associated to these assets reported by respondents. The assets gained include:

- Number of wells owned by farmers;
- Number of homes owned by farmers;
- Status of farmers' own homes; and
- Addition of assets such as agricultural equipment and livestock.

The consequent benefits of these assets include:

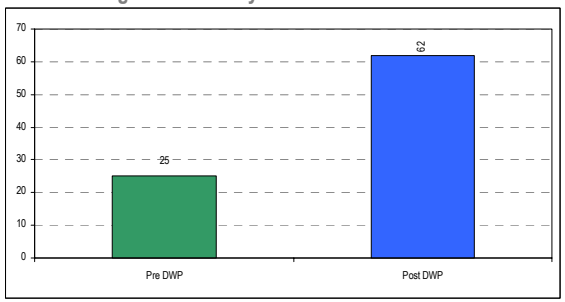
- Amount of irrigated land; and
- Crop production and income generated during Rabi and Kharif seasons.

Looking at each of these indicators illustrates the impact the DWP has had in the areas of operation as well as establishing how the dug wells operate as a livelihood assets.

Assets gained since DWP

The number of wells owned by farmers illustrates the size of ASA's DWP in the study area. The number has risen from 25 to 62 since implementation of the DWP; an increase of 148%.

Number of Dug Wells in study area

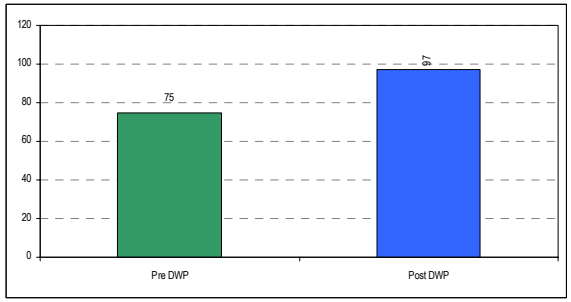


Source: ASA 2007

Before the DWP, in the study area there was the equivalent of 1 well between every 2 farmers. Following intervention each individual farmer has at least 1 well whilst 8 farmers have 2 wells and 2 farmers have 3 wells each.

The number of homes owned by farmers is a good measure of financial prosperity. Over the course of the DWP the number of homes collectively owned by farmers has increased by 30% from 75 to almost 100.

Total number of houses owned by farmers

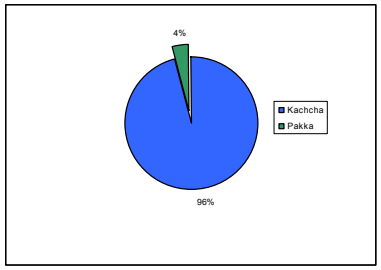


Source: ASA 2007

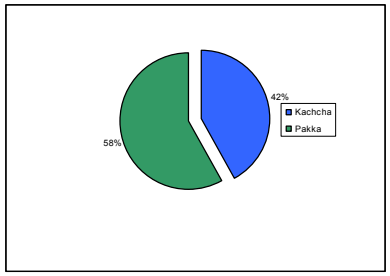
The status of the farmers' own homes supplies further evidence of improved living conditions. Of all farmers surveyed, 54% (27 individual farmers) improved their houses from Kachcha to Pakka constructions. Prior to DWP 96% of farmers were living in Kachcha houses compared to just 42% following DWP; more than halfing the proportion with a lower standard of living.

% of farmers living in Kachcha and Pakka homes before and after DWP

Before DWP



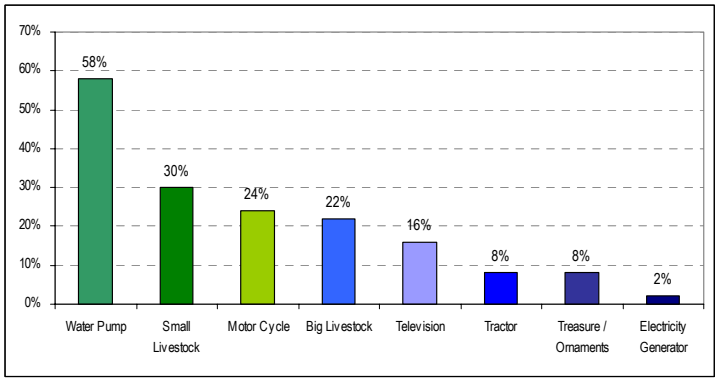
After DWP



Source: ASA, 2007

The addition of assets such as livestock and agricultural equipment also indicate the improved circumstances and economic security of farmers following the DWP. Of all individuals interviewed, 82% (41 farmers) gained further assets of this type. The majority of these assets are related to improving agriculture and production. For instance, 58% of respondents gained a water pump consequent to the DWP and 30% increased the number of small livestock. Other assets reported indicate some improvements to aspects of living standards.

Assets Gained, % of respondents



Source: ASA, 2007

Value added by dug wells

Whilst demonstrating that beneficiary farmers have gained a number of livelihood assets as a result of DWP; to establish the impact these assets have upon farmers' livelihoods and how dug well operate as livelihood assets, it is useful to consider the activities these assets have facilitated.

In relation to agriculture effects include increasing the amount of irrigated land and subsequent improvement in crops in both Rabi and Kharif seasons. Previous research also suggests that being able to invest in additional assets has led to the non-agricultural livelihood diversification[11].

Amount of irrigated land

Adequate irrigation of land is an issue for many farmers in Madhya Pradesh. Whilst government intervention has made some improvements to physical infrastructures, it is estimated only 30-35% of the regions' potential irrigation is being utilized[12]. Inadequate irrigation clearly poses problems to the

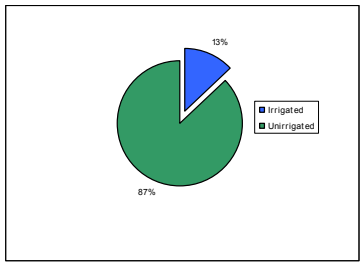
[11] For example, brick making was made possible in Lambella, Jhabua as a result of the availability of water in the ponds and other water sources.

[12] Figures based upon ASA's work in the field of Participatory Irrigation Management

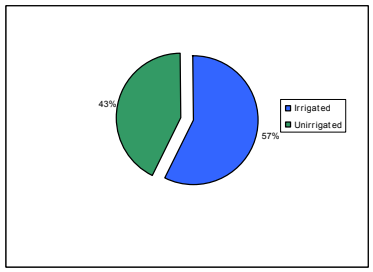
productivity of farmers' land. The larger the amount of land irrigated the more productive a farmer's crop can be. Subsequent to the DWP the amount of farmers land irrigated has dramatically improved.

% Irrigated Land

Before DWP



After DWP



Source: ASA, 2007

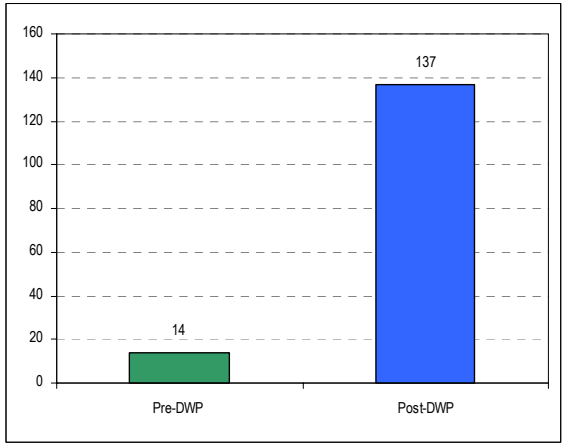
Prior to the DWP just 13% of farmers' land was irrigated. Following the DWP this has increased to 57%; a growth of 44 percentage points. Farmers now have 259 Acres of irrigated land in total, an addition of 204 Acres compared to before DWP. Whilst the numerous benefits of an increased amount of irrigated land are well established, the findings of this research continue to specify the scale and scope of these improvements in the areas ASA have been working over the last decade. This gives an indication of the magnitude of impact the DWP can effect.

Rabi season

The Rabi season is a difficult time for those dependent on agriculture. The change in climate and lack of adequate water supply during this dry season lowers production levels meaning that many farmers are unable to grow enough to feed their own families to survive. Subsequent to the DWP the area of land in production during Rabi has increased considerably from just 14 Acres prior to DWP to 137 Acres afterwards; an increase of 879%. Additional income from this increased availability of fertile soil has provided farmers short term food security without the need to migrate to support themselves finically as well as additional saving through reduced dependency on credit to purchase food.

> "When I had no Dug Well then I couldn't manage food for eat for my family. Now I sell Wheat and Maize in the market and manage our all expenses other than food" Kidiya / Kasna, Kalakhunt, Jhabua

Total increase in Land in Production, in Rabi Season



Source: ASA, 2007

> "When I had no Dug Well then our land gave us nothing to sell to others. Now I have the Dug Well then we can live from our land" Heere Singh / Keshar Singh, Kolyabeda,

Considering the improvement of the different crops produced separately provides more detail on the level of improvement achieved. In the study area whilst Wheat and Gram were produced before the DWP this level of production has seen significant improvement between the period before the DWP and after the DWP. For instance, the number of Acres producing Gram has increased by 1,538% and wheat production by 713%. In addition, farmers have been able, for the first time during Rabi, to produce Maize creating a further source of income for farmers. Such diversification can be viewed as one step towards long-term food security.

Increase in Land in Production and Income Generated, Rabi Season

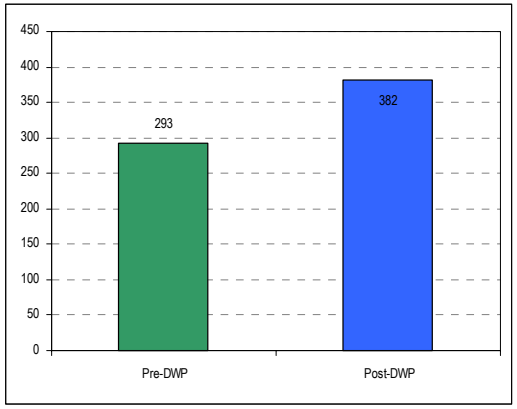
Crop	Acres				Market Price			
	Pre-DWP	Post-DWP	Increase		Pre-DWP	Post-DWP	Increase	
			No.	%			No.	%
Wheat	12	97.56	86	713	197,000	1,106,000	909,000	461
Gram	2	32.75	31	1,538	4,800	345,700	340,900	7,102
Maize	0	6.75	7	-	0	50,400	50,400	-
Total	**14**	**137**	**123**	**879**	**201,800**	**1,502,100**	**1,300,300**	**644**

Source: ASA, 2007

Kharif season

The Karif is a less difficult time for farmers when monsoon rainfall ensures success crops. That said, improved use of this water as a result of the DWP has seen improvements in these crops. The total increase in land in production has risen by 31% from 293 Acres to 382 Acres.

Total increase in Land in Production, Kharif Season



Source: ASA, 2007

Although the Karif season produced a diverse and successful harvest before the DWP, following intervention the amount of land in production, subsequent income generated from this land and number of crops has improved. Whilst some did not improve significantly; a number of crops show marked improvement. For example, Pegion Pea raising an estimated additional Rs. 123,100 and Paddy raising an additional Rs. 27,400. For the first time Soybean has also been produced generating approximately Rs. 821,700 further revenue for farmers. However, the largest increase has been in the successful farming of vegetables improving from 12.3 Acres to 40.8 Acres since DWP. The addition of this produce can also be viewed as one step towards long term food security.

Increase in Land in Production and Income Generated, Rabi Season

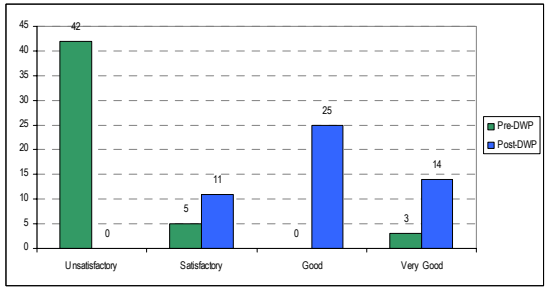
Crop	Acres				Market Price (Farmers Estimation)			
	Pre-DWP	Post-DWP	Increase		Pre-DWP	Post-DWP	Increase	
			No.	%			No.	%
Cotton	62.74	62.49	0	0	488,700	640,000	151,300	31
Maize	82.64	80.35	-2	-3	404,800	472,000	67,200	17
Pegion Pea	4.25	8.75	5	106	18,000	141,100	123,100	684
Soybean	0	72.89	73	-	0	821,700	821,700	-
Paddy	10.78	14.14	3	31	27,800	55,200	27,400	99
Ground Nut	13	11	-2	-15	25,200	21,760	-3,440	-14
Urad	65	49.5	-16	-24	59,790	502,700	442,910	741
Jwar	42	42	0	0	55,050	79,600	24,550	45
Vegetable	12.25	40.82	29	233	243,200	958,500	715,300	294
Total	**292.66**	**381.94**	**89**	**31**	**1,322,540**	**3,692,560**	**2,370,020**	**179**

1.1.4.2 Social Impacts

Social Status

Respondents' self assessment of their social circumstances provides indication of the improvement in social conditions subsequent to DWP. Each farmer was asked to rank their social conditions before and after DWP – all respondents reported an improvement in their social standing.

Social Status, No. of Respondents



Source: ASA, 2007

Prior to DWP, 84% of respondents found their social status unsatisfactory. Following DWP all farmers are at least satisfied with their circumstances and the majority (50%) considered their social circumstance as good. A number of further indicators support these improvements including the number of economic migrants as well as access to education and farmers' debt situation.

Migration

Economic migration by tribal communities is common during the Rabi season when land is unproductive. The agricultural benefits secured as a result of the installation of a dug well reduces the need for this type of migration. Prior to the DWP on average just under half of every household (44%) were forced to migrate to earn enough money to survive during this period. After the installation of the dug well the proportion of the household migrating has been reduced to under 20%. More encouraging is that the proportion of households reporting that no family members were required to migrate has almost doubled from just 30% to almost 60% following the construction of the Dug Well. This improvement is confirmed by the comments of a number of farmers.

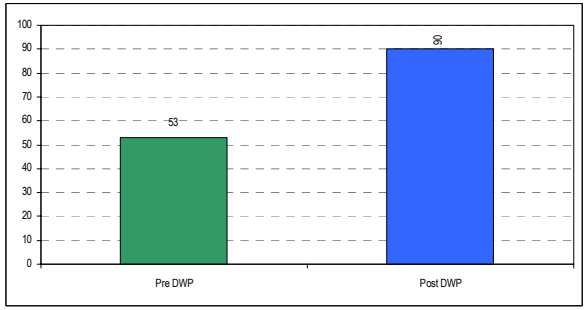
> "When I have no Dug Well then I have feel very bad with my land. But now, after Well construction, I am living on the land all year and I don't have to migrate to earn money" Soma / Hema, Morwani, Ratlam

> "I have no time for going to migrate any where after Dug Well construction. I have time only for working on own land!" Bhiku / Bhuchar, Badi Sudi, Jhabua

Education

A second important social impact that has been noted since the implementation of the DWP is the increase in the number of children attending school. Between the period before the installation of dug well and afterwards this number has increased by 70% from 53 children pre-DWP to 90 children post-DWP.

Number of school going children



Source: ASA, 2007

Improved levels of education are an important means of ensuring that improvements in living conditions are sustained by future generations. The improvement in this indicator is therefore particularly important in supporting Dug Wells as livelihood assets.

Debt

Previous research carried out by ASA also suggests that due to the DWP the issue of financial borrowing and debt is less pronounced. In some cases, the dependency on this form of subsistence is completed removed whilst for others it is reduced. The result of both is increased savings; increased self-sufficiency and reduction in the issues connected to extortionate money lending.

1.1.5 Conclusions

It is evident that the DWP has affected significant impact on the area under study here. The evidence presented establishes that dug wells operate as livelihood assets through achieving both economic and social improvements for farmers resulting in short and longer term subsistence. Headline achievements include:

Asset s Gained:

- Increase in number of wells by 148%;
- Number of houses owned by farmers increased by 30%;
- Increase of number of Pakka homes by 54%;
- Farmers living in lower standard of housing more than halved; and
- Other investments including 58% of farmers purchasing a water pump and 30% acquiring small livestock.

Consequences Achieved:

- Irrigated land increased from 13% to 57% (259 Acres), an additional 204 Acres;
- During Rabi season, prior to DWP, 14 Acres of productive land increasing to 137 Acres afterwards; an increase of 879%;
- Increased land leading to increased income as well as enabling short-term food security; reduced need for economic migration; less dependency on Money Lenders; and crop diversification leading to long-term food security; and
- Land in production during Kharif increases by 31% from 293 Acres to 382 Acres.

Social Impacts:

- All respondents reporting an improvement in living standards; majority describing conditions after DWP as "good";
- Proportion of households with no migrating members doubles from 30% to 60%; and
- Number of children attending school increased by 70% from 53 children pre-DWP to 90 children post-DWP in education.

Considering once again the broadly accepted definition of a livelihood within the development sector now demonstrates that dug wells do indeed operate as livelihood assets:

"A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain and enhance its capabilities and assets both now and in the future, while not undermining the natural resource base"[13].

Subsequent to the DWP the number of assets, physical, material and social have been improved in the study area. All of the indicators considered here contribute to the improvement of one another, resulting in a cycle of prosperity as each separate one increasingly improves individually as well as stimulating the growth of others.

Increased income as a result of improved crops as a direct result of the construction of dug wells has been used by farmers to improve their situations in a number of ways. For instance, to improve living standards, remedy some social issues (literacy, reliance on debt as a means of financial support, and economic migration) as well as investing further in equipment to improve agricultural production. This ever increasing growth in income and other associated benefits will continue to be amplified and support communities as they propel themselves into self sufficiency and a sustainable livelihood.

The evidence here supports the DWP as an effective programme to assist farmers and their families to work against poverty and towards a long term solution. To extend these benefits and allow ASA to reach a larger number of people will require additional funding. The findings of this study confirm that such funding would be effectively distributed to improve the livelihoods of rural communities in India. It also indicates that the DWP is an effective and relatively low-cost programme that could be rolled out elsewhere to effect similar impact.

[13] DFID, 1999, in Power (2003:181)

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Appendix A – Farmers' Questionnaire

Name of village----------Name of Panchayat----------
Name of Block----------District----------

1. Name of well owner----------
2. Father's Name----------
3. Family Status
   A. No. of Member below 14 year's Male----------Female---------
   B. No. of Member upper 14 years Male----------Female---------

Indicator		Pre DWP	Post DWP
Status in the village			
No. of wells			
Total Land			
Amount of Irrigated Land			
Amount of Unirrigated Land			
Main Crops:			
	Rabi		
	Kharif		
Status of Home			
Asset			
Migration status			
	Total Member		
	No. of Migrant Member		
Live Stock			
	No. of Cow		
	No. of Bullock		
	No. of Buffalo		
	No. of Goat		
No. of School going children			
Status of Credit (Amount taken)			

Format for Production Analysis from the well in Rabi Season:

Pre DWP				Post DWP			
Name of Crops	Land size	Seed	Production	Name of Crops	Land size	Seed	Production

Format for Production Analysis from the well in Kharif Season:

Pre DWP				Post DWP			
Name of Crops	Land size	Seed	Production	Name of Crops	Land size	Seed	Production

Appendix B – Farmer Beneficiaries

[PHOTOS OF FARMERS TO BE INSERTED]		
