



**Assurance Services on “Positive Water Balance”
to
PepsiCo India Holdings Pvt. Ltd**

Deloitte Touché Tohmatsu India Private Limited

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The Executive Summary

PepsiCo India Holdings Private Limited (herein referred to as *PIHPL*) is engaged in manufacturing of beverages, bottled water and snacks in India. It is a highly water intensive sector and is generally a popular target of critics, portraying it as a major source responsible for water depletion. PIHPL is committed to minimize its water footprint through greater efficiency across all their operations, in line with the mandate of PepsiCo Global – as such, it has taken various initiatives to replenish and give an access of clean water back to the local community, through watershed development programs, development of ground water recharge structures, direct seeding intervention and institutionalization of drip and sprinkler irrigation system.

In this connection, PIHPL has engaged Deloitte Touche Tohmatsu Private Limited (herein as *DTTIPL*) as an independent third party, for obtaining assurance, as per International Standard on Assurance Engagement (ISAE 3000), on their claim of Positive Water Balance, for the period Jan 2009 till Dec. 2009. In this context, Positive Water Balance means volume of Water Credit is greater than the volume of Water Debit. Water Credit relates to volume of in-plant water recharged and harvested, water re-charged through community programs and water saved through agricultural interventions. Water Debit relates to water intake in the production facilities.

As a part of the assurance engagement, DTTIPL has conducted visits to sample Water Debit Sites (*Bottling and Snacks units*) and Water Credit Sites (*Watershed Development Programs, Development of Ground Water Recharge Structures, Direct Seeding Intervention and Institutionalization of Drip and Sprinkler Irrigation System*), representing the pan India operations of PIHPL. On water debit side, a total of six bottling and one snacks unit were considered for review. On water credit side, two sites for direct seeding intervention, two sites for community development initiatives and three sites for in plant rain water harvesting and one site for drip irrigation system were considered for review. DTTIPL has conducted a review of the processes and systems, sample tests of data from the books and records of the company, stakeholder consultation at the community development and agricultural intervention sites, analytical procedures and discussions with the management of the company, to arrive at the estimate claimed by PIHPL.

Although, no such major deviations were identified in the debit side, the credit side had reflected some deviations - which primarily relates to absence of relevant data/measurement undertaken by PIHPL for its direct seeding intervention in the southern states of India and also for its drip and sprinkler irrigation system & non application of relevant methodology for measurement of in-plant rainwater harvesting. PIHPL has been recommended to establish relevant mechanism to measure and monitor water savings resulting from direct seeding interventions; drip/sprinkler irrigation system and water recharged through in-plant rain-water harvesting.

PIHPL had claimed of Positive Water Balance with its Water Credit being 6004 million liters and Water Debit being 5168 million liters. On the basis of the methodology adopted and review conducted by DTTIPL, it could be estimated that PIHPL is Water Positive, by 836 Million Liters, for the aforesaid period.

The professionals of DTTIPL have observed an overwhelming response during stakeholder consultation process carried out for the community initiatives and agricultural intervention driven by PIHPL, during the visit to the sample sites. All the stakeholders have appreciated and endorsed the water savings/recharge initiatives undertaken by PIHPL. Some community development programs have also enabled to increase the livelihood of the local community, as claimed by some stakeholders in certain sites.



SECTION- A

1.1 Abbreviations

SL#	Site	Details
1	DTTIPL	Deloitte Touche Tohmatsu India Private Limited
2	PIHPL	PepsiCo India Holdings Pvt.Ltd.
3	DSR	Direct Seeding
4	ISAE	International Standard on Assurance Engagement
5	KPI	Key Performance Indicators
6	RWH	Rain Water Harvesting
7	MML	Million Liters



SECTION- B

2.1 Definition of Positive Water Balance

- **Water Debit** - Volume of Intake Water inside the facilities of bottled water, beverages and snacks
- **Water Credit** - Volume of Water Saved /Recharged through community initiatives, agricultural interventions and rain water harvesting

The term **Positive Water Balance** implies that **Water Credit** is Greater than **Water Debit**

(For all practical purpose the volume of water is measured in MML (million litter) 1MML= 1000kL= 1000000 L)

Positive Water Balance Indicates :

In-plant water recharge and harvesting +

Water re-charged through community programs +

Saving through agricultural interventions



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Water Intake in Production Facilities

Water Credit

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Water Debit

2.2 Scope of Work

PepsiCo India Holdings Pvt. Ltd (herein as PIHPL) has taken an initiative to demonstrate achievement of “Positive Water Balance” for their Indian operations. In this connection, PIHPL has engaged Deloitte Touche Tohmatsu Private Limited (herein as DTTIPL) as an independent third party, for obtaining Assurance Service as per the highest standard of non financial performance (i.e. International Standard on Assurance Engagement 3000) to demonstrate transparency and strengthen their initiatives on their recharge/savings of water and thereby add credibility to their demonstration to the stakeholders that PIHPL is giving back more or at least an equivalent quantity of intake water used inside their manufacturing facilities, back to the society through various initiatives, i.e. in brief PIHPL is taking a measure to demonstrate that it is Positive on the Credit Side of Water Balance.

Approach

- Discussion on the methodology, followed by collection of corporate level data for Water Debit and Water Credit
- Finalizing sites for audit of the Debit and Credit volume (Details are provided in subsequent sections)
- Collating and Finalization of the Water Debit and Water Credit figures, through review of the related documentations and volume of water consumed/saved/recharged at the respective sites
- Recording of Methodology and Deviations in the respective Audit Protocols
- Submission of Management Report
- Submission of Assurance Statement

2.3 Auditing Standard Applied

ISAE 3000 - International Standards on Assurance Engagement 3000

2.4 Documents Reviewed

Item	Documentations Reviewed
Debit Side – Water Consumption	<ul style="list-style-type: none"> • Plant level water consumption log sheets, Recorded Data • SAP system data, Water Invoices • Calibration certificates of Main meter, Consent to operate • Water reuse ,recycle details, if any
Credit Side- Agricultural Initiatives	<ul style="list-style-type: none"> • Third party assessment report on estimation of water saving by direct seeding • Documents pertaining to sown area, irrigation applied, rainfall • Comparative study data of direct seeding and transplanted fields for estimation of water savings in kL/Acre in Punjab • Stakeholder consultation at Jallowal and Thiruvellur
Credit Side- Community Initiative	<ul style="list-style-type: none"> • Details of watershed area, topography, drainage lines etc along with the structural design, drawing for check dams, recharge structure and recharge ponds/wells • Field level water recharge calculations. • Stakeholder consultation at Paithan
Credit Side- Irrigation Systems	<ul style="list-style-type: none"> • Details of area under drip and sprinkler irrigation system • Details related to percentage saving in drip and sprinkler irrigation systems as compared to flooding irrigation system in potato cultivation. • Stakeholder consultation at Satara- Pune Region
Credit Side- In Plant Recharge	<ul style="list-style-type: none"> • Details related to design roof water harvesting mechanism, collection/recharge ponds, trenches. • Details related to operational parameters such as rainfall, infiltration rate • Water recharge calculations.

2.5 Sample Sites

Debit Side- Water Consumption

SL #	Site	Details	Location
Bottling Units			
1	Aurangabad	Debit Side	Maharashtra, India
2	Palkkad	Debit Side	Kerela,India
3	Nelamangla	Debit Side	Karnataka, India
4	Madurai	Debit Side	Tamilnadu,India
5	Panipat	Debit Side	Haryana, India
6	Jamshedpur	Debit Side	Jharkhand, India
Snacks Unit			
1	Pune	Debit Side	Maharashtra, India

Credit Side - Water Recharged/Saved

SL#	Site	Details	Location
1	Jalandar, Jallowal Farms	Agricultural Initiative	Punjab, India
2	Thiruvellur	Agricultural Initiative	Tamil Nadu, India
3	Painthan, Aurangabad	Check Dams, Well Recharge Structures	Maharashtra, India
4	Tonchinkuppe, Hosur, T.Kempali (near Nelamangla)	Recharge Ponds and DROP Initiative	Karnataka, India
5	Aurangabad Bottling Unit	In Plant RWH	Maharashtra, India
6	Palkkad Bottling Unit	In Plant RWH	Kerela,India
7	Nelamangla Bottling Unit	In Plant RWH	Karnataka, India
8	Satara-Pune	Drip Irrigation for Potato Cultivation	Maharashtra, India

2.6 Methodology and Verified Data

2.6.1 Methodology Applied and Verified Data- Water Debit

- In terms of Number of Units, 6 of 34 bottling units (18%) and 1 of the 3 (33%) snacks units have been covered in the review.
- In terms of Volume 6 of 34 bottling units (19%) and 1 of the 3 (46%) snacks units have been covered in the review.
- Daily plant level log sheets/water consumption records, water meter readings, water invoices, Consent to Operate, Water Reused/Recycled, SAP records, Water Invoices and water meter calibration certificates were reviewed.
- Evidences gathered on water consumption through sample record checking & on-site interviews with concerned personnel.
- Deviation, if any, as against the reported figure of PepsiCo have been estimated against the sample volume audited, which have been finally applied across the overall initial reported consumption figure of PepsiCo, to arrive at an inferred total intake figure.

SI. #	Parameters for the Period of Jan. to Dec. '09	Volume of Water in (MML)
1	Volume Reported by PIHPL for 34 Bottling Units (Including Jan to Nov '09 and Projected Volumes of Dec '09)	4615.5
2	Volume Reported by PepsiCo for 6 of the Bottling Units prior to Audit	893.92
3	Volume Verified by DTTIPL for 6 of the Bottling Units	895.48
4	% of Deviation Observed against the volume reported and verified for 6 of the Bottling Units	-0.175*
A	Actual total volume to be considered for the Period of Jan 2009- Dec 2009 [34 Bottling Units = 4615.5 x (0.175%) + 4615.5]	4623.6
1	Volume Reported by PIHPL for 3 Snacks Units	543.8
2	Volume Reported by PIHPL for the Pune Snacks Units prior to the Audit	251.47
3	Volume Verified by DTTIPL for the Pune Snacks Units	251.58
4	Percentage of Deviation Observed against the Volume Reported and Verified for the Foods Division	-0.040
B	Actual total volume to be considered for the Period of Jan 2009- Dec 2009 [3 Snacks Units = 543.8 x (0.040%) + 543.8]	544.01
	Total Volume of Water Consumed by PIHPL during Jan 2009-Dec 2009 (A+B)	5168

* Deviation recorded on total volume of 6 bottling units. Individual site deviations are provided in the audit protocols

2.6.2 Methodology Applied and Verified Data- Water Credit –Agricultural Intervention

- Of the 5 states, where agricultural initiatives have been taken up, 2 sites (Punjab & Tamilnadu) have been taken as samples by DTTIPL for review.

Sl. #	Sample Sites Visited	Basis of Selection of Sites	Representative Sites
1	Jalandar - Jallowal Farms	To give a representation of: <ul style="list-style-type: none"> Type of agro-climatic conditions; Agricultural practices, prior to technology intervention Source of irrigation 	Sites of Punjab and Rajasthan
2	Thiruvellur		Sites of Tamilnadu, Karnataka and Pondicherry

- Of the 10 experimental plots set up in Punjab, DTTIPL had done a review of the same to arrive at the water savings per acre, to estimate the water savings. No deviation was recorded. This becomes our basis and base for our further review.

Sl. #	Total Water Savings Data Submitted by Corporate Office (KL/Acre)	Water Savings Data Considered by DTTIPL for Audit (KL/Acre)	Water Savings Data Audited by DTTIPL (KL/Acre)	% of Deviation (in KL/Acre)	Actual Water Savings (KL/Acre)
1	900	900	900	0.0%	900

- PIHPL has actually estimated a figure of 1200 kL/acre as the average water savings from 10 experimental plots. However a conservative figure at 75% of 1200 kL/acre has been considered by PIHPL, which accounts to 900 kL/acre.
- DTTIPL has considered 900 KL/Acre, as the water savings for the sites based in Rajasthan and Punjab, since these have similar agro-climatic conditions.

Sl. #	Total Area Under Direct Seeding and Water Savings Data Submitted by Corporate Office	Water Savings Considered by DTTIPL for Audit (in KL/Acre)	Water Savings As Per Estimation of DTTIPL (MML)
1	5021 acre	900	4067¹

1- considering 90% success rate-Water Savings= 5021acre x 900kL/acre x 90%



Methodology Applied and Verified Data- Water Credit –Agricultural Intervention (Contd...)

- The agricultural practices and agro-climatic conditions in North India (Punjab) are widely different from that of Southern India (Thiruvellur, Dharwad, Pondicherry etc).
- However, appreciating the fact that there has been water savings due to similar agricultural initiative in South India, a conservative water saving /acre has been considered and applied for the land areas in the Southern India. This conservative value has been calculated based on worst case scenario of water saving in the experimental plot of Punjab which is equal to 900kL/acre and further applying the conservative factor of 50%, to estimate the water savings for Thiruvellur and South Indian Region.
- The conservative water saving value, in terms of kL/Acre applied for South India is further substantiated by the fact that the different published literature indicates much higher water savings due to direct seeding.
- It is recommended to set up experimental fields in Thiruvellur/Dharwad/Pondicherry in order to estimate the water savings (in KL/Acre) due to direct seeding.

SI. #	Water Savings (kL/acre) in the worst case scenario of Punjab	Water Savings (kL/acre) considered by DTTIPL for South India
1	900	450

SI. #	Total Area Under Direct Seeding and Water Savings Data Submitted by Corporate Office	Water Savings Considered by DTTIPL for Audit (in KL/Acre)	Water Savings As Per Estimation of DTTIPL (MML)
1	1592 acre	450	645 ²

2- considering 90% success rate-Water Savings= 1592acre x 645kL/acre x 0.9

SI. #	Total Water Savings Through Agricultural. Intervention (MML)	Volume (MML)
1	Punjab and Rajasthan	4067
2	Tamilnadu, Karnataka and Pondicherry	645
Agricultural Intervention -Total Water Savings to be Considered for Reporting (MML)		4712



2.6.3 Methodology Applied and Verified Data- Water Credit –Community Initiatives

- Following four initiatives under the Community Recharge Program have been considered for Audit by DTTIPL;
 - Check Dams
 - Well Recharge Structures
 - Recharge Ponds
 - DROP (Drip Irrigation, Rainwater Harvesting and recharge ponds at Nelamangla in Association with TERI)
- Details related to Watershed Area, Topography, Drainage lines, etc. along with the structural design ,drawing for check dams, recharge structure and recharge ponds/wells were reviewed. *The recharge volume has been estimated on the basis of technical data shared with DTTIPL.*
- Evidences on the community initiative were gathered based on visual inspection, interviews with the respective field in-charge & local stakeholders and on-site records.
- Assessment of total water recharge through community initiative has been carried out on the basis of design of structures, rainfall data, runoff and infiltration capacity details.

Sl. #	Initiative	Total Water Recharge Data Submitted by PepsiCo Corporate Office (in MML)	Water Recharge Data Considered by DTTIPL for Audit (in MML)	Water Recharge Data Audited by DTTIPL (in MML)	% Deviation Observed & Recorded Post Audit	Actual Water Recharge Assessed (in MML)
1	Check Dams	612	612	609	0.50%	609
2	Well Recharge Structure (100 #)	110	110	110	0.00%	110
3	Recharge Pond (3 #)	382	382	318	16.75%	318
4	DROP Initiative-Nelamangla*	122	122	122	0.00%	122
Total Water Recharge Through Community Initiative						1159

* Drip Rainwater Harvesting and Pond- DROP Initiative at Nelamangla in Association with TERI



2.6.4 Methodology Applied and Verified Data- Water Credit –In Plant Rainwater Harvesting

- Three sites of the Beverage section and One site of the Foods section, with in-plant rainwater harvesting system have been considered for audit by DTTIPL.
- No monitoring system available to assess the total quantity of water recharged through the Rain Water Harvesting facility, available at Pune.
- Reviewed the design details related to roof water harvesting mechanism, collection/recharge ponds, trenches etc. wherever applicable, subject to availability of data.
- Reviewed the on-sites records for rainfall & water recharge potential and gathered evidence through visual inspection and on-site interviews with the respective plant in charge.
- The groundwater recharge through the rainwater falling on uncovered area within the plant premises reported by PIHPL has not been considered as the reported figures are not supported by scientific values/ evidences of site specific infiltration rate, evapo-transpiration rate, runoff coefficient etc.
- Assessment of total water recharge through in plant initiative has been carried out on the basis of the design of structures, rainfall data, run-off potential and infiltration capacity details.

Sl. #	Units	Total Water Recharge Data Submitted by Corporate Office (MML)	Water Consumption Data Considered by DTTIPL for Audit (MML) (3 # in Beverage Units & 1 # in Foods Division)	Water Consumption figure as estimated by DTTIPL (MML) (3 Beverage Units)	% Deviation
1	Beverages (20#)	314	136	42.30	69%
2	Snacks (3#)	0	0	0	0%
Total Water Recharged Through In Plant Initiative for the 20 Plants and 3 Snacks Units Reported by PepsiCo					133 MML

2.6.4 Methodology Applied and Verified Data- Water Credit –Efficient Irrigation System

- Two types of Efficient Irrigation initiatives, i.e. i) Drip Irrigation System and ii) Sprinkler Irrigation System have been considered for audit by DTTIPL. A visit was carried out to the Drip Irrigation System facility located at Pune, Satara region.
- Drip and Sprinkler irrigation systems are well established technologies and different published literature indicate substantial water saving, up to 50-70% through drip and up to 30-50% through sprinkler irrigation system.
- PIHPL has not conducted any experiments to estimate the water savings through drip and sprinkler irrigation system. Hence DTTIPL has not considered the water savings through drip and sprinkler irrigation system for year 2009.
- It is recommended to set up experimental fields in Satara and Punjab in order to estimate the water savings (in kL/Acre) due to drip and sprinkler irrigation system.

Sl. #	Initiative	Aerial Coverage (acre)	Water Savings (kL/acre)	Water Savings (MML)	Water Savings Considered by DTTIPL
1	Drip Irrigation System	286	0	0	0
2	Sprinkler Irrigation System	131	0	0	0
Total Water Saved through Efficient Irrigation Systems				0	

2.7 Positive Water Balance Equation

Credit Side	Debit Side
In-plant water recharge and harvesting (133 MML)	Water usage in production facility (5168 MML)
Water re-charged through community programs (1159 MML)	
Saving through agricultural interventions (4712 MML)	
6004 MML	5168 MML

Credit Side > Debit Side