

Presentation on A case of Bundling of Projects for CDM Funding (Nepal Biogas Programme)

Methane to Markets Partnership Expo
Taj Palace Hotel,- Delhi, India
March 02-05, 2010

BSP is Funded/Assisted Mainly by:



AEPC/GoN



SNV/DGIS



KfW



Presentation by

Prakash Lamichhane
Manager
BSP-Nepal

prakash@bspnepal.wlink.com.np

Implemented by:

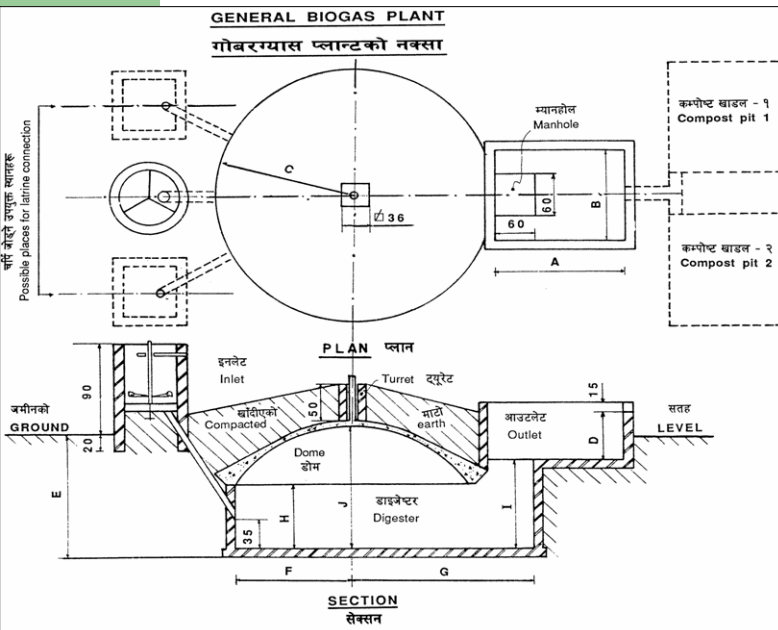
Biogas Sector Partnership – Nepal
(BSP-Nepal)



Biogas Plant Design in Nepal (1)

- Biogas Plant (GGC 2047 Design)

Plant Drawing

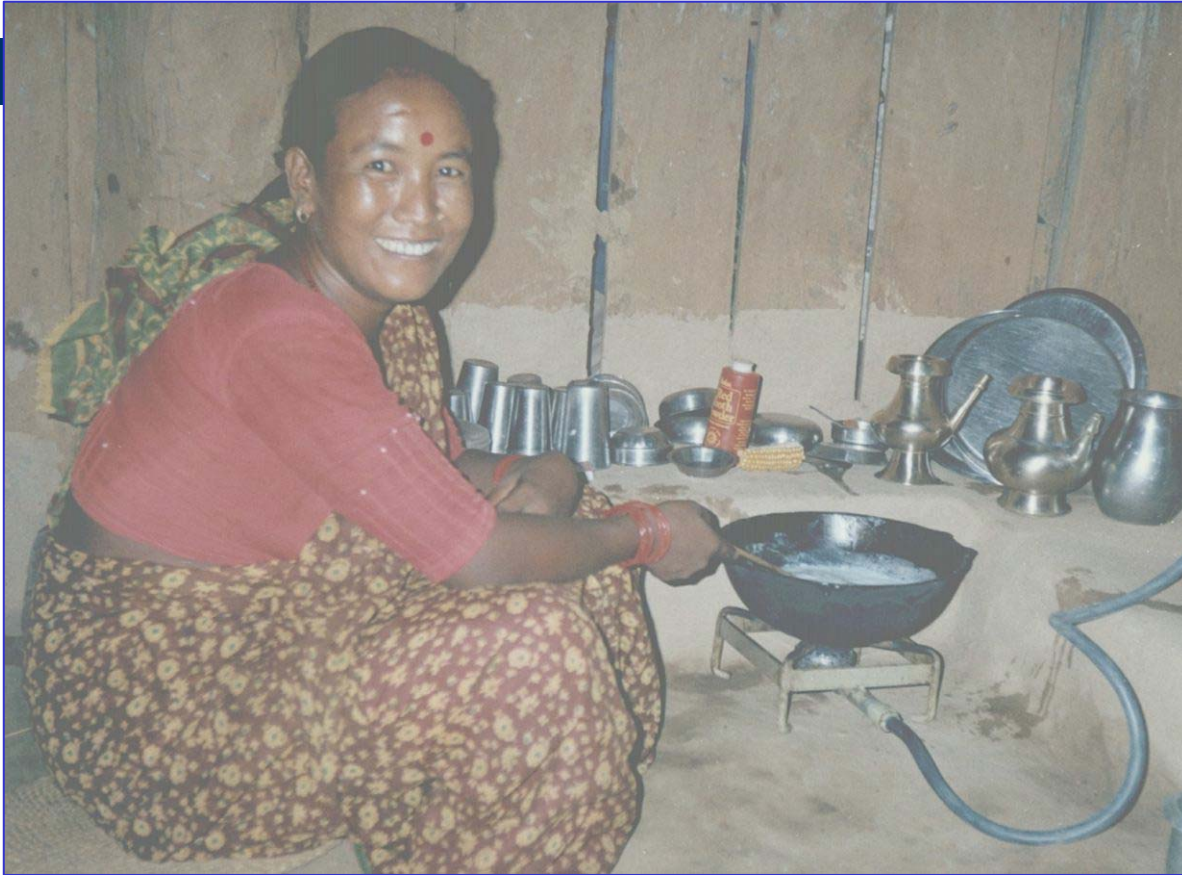


Life without Biogas ...



- **Women, Children and Environment Bear the Brunt!**

And Life with Biogas.



- Biogas brings multiple Socio-economic & environmental benefits.
- Bio-slurry or bio-compost is equally useful product.

Slurry, As A By-Product: High Quality Organic Fertilizer



Biogas for Better Life!



Pioneering the Technology in Nepal (1)

- **In 1955**
 - **Father Soubolle of St. Xavier's School, Godawari, Nepal Constructed 1st Experimented & Demonstrated Biogas Plant in Nepal.**
- **In 1968**
 - **Khadi Village Industry Commission (KVIC) of India constructed 250 cft biogas system at an exhibition in Kathmandu.**
- **In 1975/76 (Agriculture Year)**
 - **Promotion of domestic biogas (cattle dung) was initiated by Nepal govt. under DoA and 199 plants constructed in that year.**

Pioneering the Technology in Nepal (2)

- **In 1977:**
 - A Biogas Company (GGC) was established as a joint venture among ADBN (now ADBL), UMN and Nepal Fuel Corporation.
 - ADBN provided soft loan to users at 6% interest rate for biogas construction.
- **In 1990**
 - A fixed dome design (GGC 2047) was recognized as the standard design in Nepal after several research and modifications from a Chinese fixed dome design.

Introduction of Biogas Support Programme (BSP) - 1

- **In 1992**
 - **Biogas Support Programme (BSP) was established by SNV Nepal with funding from the Dutch Government.**
- **From BSP-III (1997-2003), KfW and Gov't of Nepal also started funding BSP for subsidy part.**
- **The Phase IV of the national programme BSP (Jul '03 - Jun '09) is being implemented by BSP-Nepal, successor of BSP/SNV.**

Benefits of Biogas & Bio-Slurry (1)

- **Clean cooking and lighting energy – clean indoor environment, clean utensils, etc.**
- **Reduced drudgery - time and energy saved.**
- **Saving in kerosene purchase.**
- **Saving in firewood, agro-waste and dung.**
- **Improved health, improved children's education, self-esteem, etc.**

Benefits of Biogas & Bio-Slurry (2)

- **Use of bio-slurry and bio-compost improves agriculture yield and reduces use of chemical fertilizer.**
- **Toilet construction and connection**
 - Improved sanitation and less dependence on cattle dung.
- **Green House Gas (GHG) emission reduction and contribution to reduction in global warming.**

Introduction of Biogas Technology (1)

- **Any organic material when subject to anaerobic fermentation (in absence of oxygen), produces a gas called “biogas”.**
 - **Biogas produced from cattle dung consists of around 60-70% methane.**
- **Actually, biogas production takes place naturally. The technology helps improve production, collection and use of it productively.**
- **Biogas can be used as an energy source for any purpose from cooking to electricity generation.**

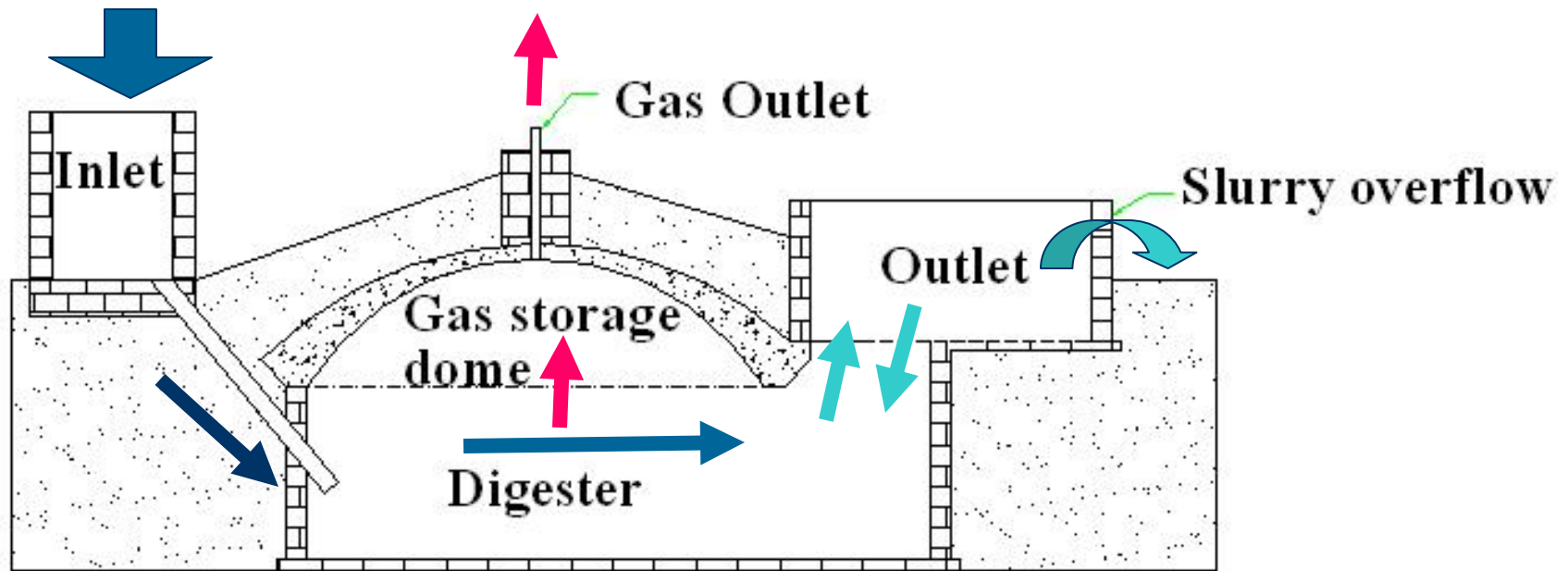
Introduction of Biogas Technology (2)

- **In Nepal, biogas is produced from cattle dung in household biogas plants and used mainly for cooking.**
 - Traditionally focused on promotion of such household plants only.
 - Currently, plant sizes of 2, 4, 6 and 8 cubic metres get subsidy.
- **There are few larger size (up to 50 cubic metres) institutional biogas plants built in Nepal.**
- **It is also possible to have community plants (a plant for a number of households).**



Biogas Plant Design in Nepal (2)

- A Sectional View of Biogas Digester Showing Feed Inlet, Gas Outlet and Slurry Overflow.



Impact of Climate Change in Nepal

- **Temperature is Rising and Snow is Melting**
 - Warming in Nepal is faster than the global average
 - Average annual temperature rise in Nepal = 0.06°C
 - Average temperature rise from 1975 to 2006 = 1.8°C
 - Snowline and glacier river receding.
 - Warmer and dryer winters.
 - Increasing risk of glacier lake burst.
- **Climate is Changing**
 - Monsoon is being shifted or irregular.
 - Incidence of flash rain increasing; 100 ml/day rainfall days increasing leading to frequent flash flood, etc.

Clean Development Mechanism (1)

- **UN adopted United Nations Framework Convention on Climate Change (UNFCCC) in 1992 (the Earth Summit)**
 - UN adopted different mechanisms with specific objectives and targets in 1997 (the Kyoto Protocol)
 - Clean Development Mechanism (CDM) is the only instrument under Kyoto Protocol that has to do with the developing world.

Clean Development Mechanism (2)

- **Objective of CDM**

1. **CDM is an innovative mechanism for North-South cooperation in climate change mitigation. It helps developed countries meet their emission reduction obligation.**
2. **CDM has also the objective of promoting sustainable development in the developing countries.**

Initiating CDM in Biogas Sector in Nepal (1)

- **In Recognition of BSP's Substantial Social, Economic & Environmental Impacts**
 - It was decided to develop CDM Projects in biogas, as early as 2001.
- **A consultant was hired in Dec 2002 for preparatory work**
 - Baseline, methodology, Project Identification Note (PIN) and Project Design Document (PDD) were subsequently prepared.

Initiating CDM in Biogas Sector in Nepal (2)

- **A Letter of Intent was Signed with the World Bank**
 - For its Community Development Carbon Fund (CDCF) in January 2005 for trading at US \$ 4.5 per ton.
- **Nepal Submitted its Instrument of Accession to Kyoto Protocol in Sep 2005**
 - And it established Designated National Authority (DNA) in the Ministry of Environment, Science & Technology (MoEST) in November 2005.

Initiating CDM in Biogas Sector in Nepal (3)

- **CDM Executive Board Could not Approve the Methodology**
 - pointing out a number of arguments against including projects that replace non-renewable biomass in CDM.
 - After request, keeping soft corner, the EB did allow registration of the 2 projects that were ready with a total of 19,396 plants (on Dec 27, 2005).
 - The calculation gave 7.4 tons/plant/year
 - But the methodology limited to 4.99 tons.

Initiating CDM in Biogas Sector in Nepal (4)

- **Agreement Signed with the World Bank**
 - On May 3, 2006 for Sale of 1 million tons of Emission Reduction at the rate of US \$ 7.
 - With this, the projects give ~ US \$ 600,000 as net income, annually.
 - The annual Emission Reduction Report and Community Benefit Report were sent regularly.
 - Verification of first round of Report took place in January 2007.

Fate & Status of 1st Two CDM Projects (1)

- **Things Did not Go as Expected**
 - Verifier Took over 1 year to submit the report.
 - The EB also took long time to decide and finally informed in August 2008 that the monitoring was not acceptable.
 - The reason was that they wanted Project wise users' survey, instead of one national survey.
- **An Appeal was Made in October 2008**
 - EB informed after some 6 months that the appeal was accepted.

Fate & Status of 1st Two CDM Projects (2)

- **New Users' Surveys as per Need of EB have been carried out**
 - Revised Emission Reduction reports will be submitted soon.
- **The World Bank Agreement is not for CER**
 - Even in case of failure to get Certified Emission Reduction (CER) from EB, the payment will still come.
- **Payment for 2004/05 and 2005/06 Received.**
 - US \$ 848,784 (514,786 + 333,998)

Another Battle for CDM in Biogas (1)

- **The CDM Executive Board was Asked Developed an Alternative Methodology**
 - that requires to assume that if no biogas plants, one would switch to fossil fuels like kerosene.
 - Nepal delegation in the 2006 CoP/CMP in Nairobi, Kenya put up a strong lobbying and arguments.
 - Though the hard work saved the prospects, the methodology could not be approved.
 - As per a decision, EB further improved the methodology and recommended to Bali CoP/CMP in December 2007.

Another Battle for CDM in Biogas (2)

- **Nepal Delegation Worked Hard in Bali**
 - Positive discussion about Reduction of Emission from Deforestation and Degradation (REDD)
- **CDM EB Approved the Methodology in January 2008, after Additional Improvement**
 - Stricter definition of Non-Renewable Biomass (NRB), Baseline, Leakage, etc.
 - It only gives around 2 tons of CO₂/plant/year.

Another Battle for CDM in Biogas (3)

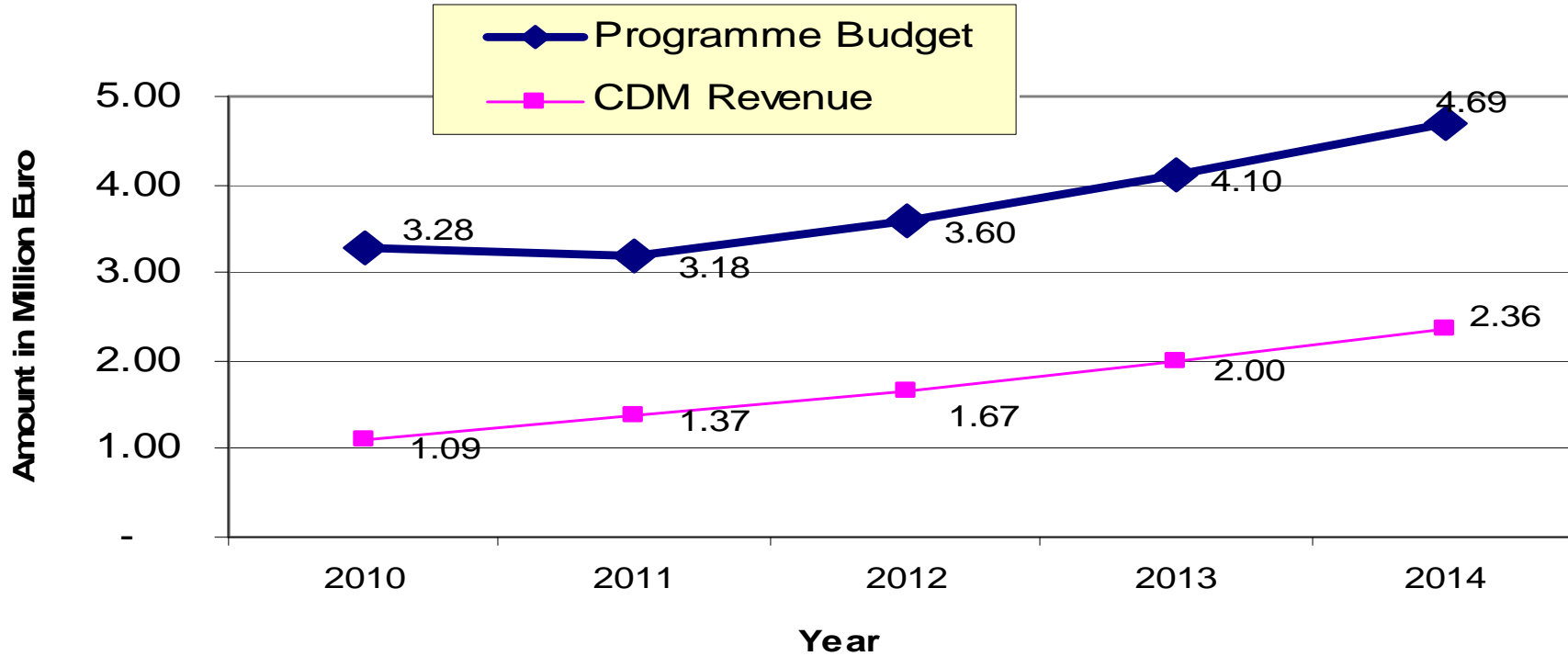
- **Earlier, MoU Signed on Oct 17, '06 with KfW**
 - For development of Biogas CDM Project hoping a new methodology to be approved soon.
 - This kind of tie up is required for many reasons
 - For Pre-Financing Project Development
 - Access to Market and Experts
 - Lobbying, etc.
- **KfW, AEPC and BSP-Nepal Started to Develop New CDM Projects**
 - Consultant hired already with KfW pre-finance for baseline, PIN and PDDs.

New Hope for CDM Revenue (1)

- **New Projects being Developed with Programme of Activities (PoA) Approach.**
 - This approach substantially reduces the hassle and transaction cost.
 - Once registered, valid for all “Projects” in the “Programme” in next 28 years.
 - ~ 36,000 plants can be registered immediately.
 - Is ready and validation is about to start

Projected Budget of BSP vs. CDM Revenue

BSP: Estimated Subsidy+Prog. Mmgt. Budget vs. CDM Revenue



- Even with very conservative estimation, CDM can cover around 30 to 50% of the total Budget in Next 5 Years.

Different Biogas CDM Methodologies (1)

- **Old Methodology**
 - *Methodology I.C.: Switch from Non-Renewable Biomass to Renewable Energy Sources.*
- **New Methodology**
 - *Methodology I.E: Switch from Non-Renewable Biomass for Thermal Applications by the User.*
- **Other Biogas CDM Methodologies**
 - *Methodology I.C: Replacement of Fossil Fuel by Renewable Energy.*
 - *Methodology III.D: Methane Recovery in Agricultural and Agro Industrial Activities.*

Different Biogas CDM Methodologies (2)

- **Rationale**
 - **Old Methodology**
 - GHG Emission Reduction takes place when users of non-renewable biomass switch to renewable energy like biogas for thermal energy use.
 - **New Methodology**
 - GHG Emission Reduction takes place when users of non-renewable biomass switch to renewable energy like biogas for thermal energy use.
 - And in absence of renewable energy like biogas, the users would switch to fossil fuel like kerosene.

Different Biogas CDM Methodologies (3)

- **Formula of Old Methodology**
 - Emission Reduction (ER) Factor for a Biogas Plant in tons of CO₂ eqv. = CO₂ ER from kerosene saving in tons of CO₂ + CO₂ ER of fuel wood saving in tons of CO₂ (factored for Non-Renewable Biomass) + CH₄ ER from fuel wood saving in tons of CO₂ eqv. – CH₄ leakage from biogas digester in tons of CO₂ eqv.
- **Net Annual Emission Reduction per Plant**
 - Roughly 3 tons of CO₂ eqv. GHGs.

Different Biogas CDM Methodologies (4)

- **Formula of New Methodology**
 - Emission Reduction (ER) Factor for a Biogas Plant in tons of CO₂ eqv. = Quantity of Biomass in tons that is substituted X Fraction of Non-Renewable Biomass (NRB) X Net Calorific Value (in TJ/ton) of the NRB X Emission Factor (in tons of CO₂/TJ) for the projected fossil fuel consumption in the baseline.
- **Net Annual Emission Reduction per Plant**
 - Roughly 2 tons of CO₂ eqv. GHGs.

VER Market: A Fall Back Position (1)

- **VER Market is Becoming Substantial and also Regulated in Similar Way as CDM.**
 - The price is lower than CDM
 - Some projects are more favoured than others
 - A Gold Standard VER methodology has been developed for Biogas Project.
 - In 2007, a separate project called Gold Standard VER Biogas Project (GSP) started in Nepal with same modality as BSP and funding from WWF.

VER Market: A Fall Back Position (2)

- **Gold Standard VER Methodology**
 - **Rationale**
 - GHG Emission Reduction takes place when users of NRB switch to biogas for thermal energy use.
 - **Formula**
 - Emission Reduction = (Baseline Emission from fuel consumption for thermal energy needs and from animal waste handling) – (Project Emission from the fuel the consumption and from the biogas plant)
 - **Net Annual Emission Reduction per Plant**
 - Roughly 4.02 tons of CO₂ eqv. GHGs.

Summing Up (1)

- **CDM is Both Opportunity and Challenge.**
 - Doing CDM has been like riding a Roller Coaster!
 - Doing it requires a lot of resources, including knowledge and skills to develop and implement.
 - There have been a lot of appreciations and recognitions.
 - Some people criticize us for not doing good enough.

Summing Up (2)

- **CDM is Trade and not Aid.**
 - If acted in time, there is a huge potential in CDM that can help financing development activities.
 - Market World Could not be as Friendly as the Development World.
 - Taking risk and making Investment in time is the game.
 - Any player has the right to be part of the trade.

Summing Up (3)

- **Use of Biogas CDM Revenue**
 - After providing subsidy, AEPC draws the right from the user to do CDM & trade
 - The revenue is for continuation of BSP.
 - This revenue is likely to make BSP substantially self-reliant, financially within few years.
- **In Case of Old Methodology Revived and or Price Increase**
 - A complete financial self-reliance is not impossible.

District Wise Distribution of Potential and Constructed Biogas Plants

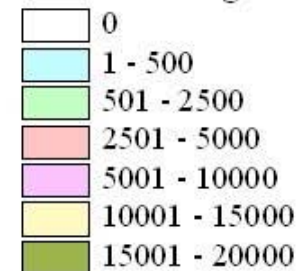
(Biogas Plants Constructed in Nepal under BSP from 1992 to Oct 31, 2009)



LEGEND:

↑ LPD

Construction Figures overall



Summary:

Total Technical Potential	1,023,366
Total Construction	204,497
Progress	19.98 %
Total Market Potential	504,291

Over 200,000 Household Biogas Plants in Nepal

Thank You