**Action Plans**

**Table 1**: Group 1 - What can we do to systematically integrate roads for water (including bio-engineering) in strategic road development and maintenance? What are the things that can be done in the next 3-6 months?

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| **Strategic Roads**  |
| What we will do? | 1. Data collection from existing sources
2. Data from design reports
3. Identify sources of water from river alignment
4. To know present situation
5. How we can use this water for beneficial use as: irrigation, drinking water for people traveling on the road
6. Preliminary study from maps and go for reconnaissance
7. Check the obtained data from maps by field verification
8. If additional things required, we should go for that
9. Basically, road follow existing river alignment valley and so many crosses the road by river. We will find out how this water will be smartly managed for Beneficial purpose
 |
| What we want to achieve? | 1. Show the roads with application of GRfW concept
2. Water auditing
3. Smart & beneficial use of water than wasting it
 |
| Who will do what? | 1. Department of Roads (DoR)
2. Stakeholder, organization related to DoR
3. DoR with MetaMeta
 |
| What is the role of government? | Government has to agree and lead the prospectGovernment has to coordinateGovernment has to provide proper space and authority |
| Timing of activities? | 3-6 months |

**Table 2**: Group 2 - How can we support municipalities to improve the quality of non-engineered roads including roads for water? What are the things that can be done in the next 3-6 months?

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| **Non-Engineered roads (Godawari Municipality Roads)** |
| What we will do? | 1. Technical auditing of existing non-engineered roads (geometrical research)
2. Maintaining geometric Standards
3. Providing proper drainage system
4. For new road construction
* Stop constructing non-engineer roads
* Road construction only after DPR (no budget allocation without DPR)
* Road construction only after environmental assessment (no budget allocation without environmental assessment)
 |
| What we want to achieve? | 1. Engineered roads
2. All season functioning roads
3. Systematic maintenance management
4. Green Roads
5. Road Water management for multiple purposes
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| Who will do what? | Policy maker🡪 CommitmentDoLI, MetaMeta🡪 Capacity development for technical supportTechnical person🡪 ImplementationLocal community🡪 Road maintenance and bio-engineering |
| What is the role of government? | Federal Government/ Provincial Government:* Making policies, guidelines, standards, norms, working procedures
* Budget planning, allocation and sanction
* Capacity building program

Local Government:* Planning and budgeting
* Action Plan
* Implementation
* Operation & Maintenance
* Capacity building
* Water auditing
 |
| Timing of activities? | 3-6 months:* Grade maintenance
* Road-side drain construction
* Graveling on earthen roads
* Road inventory
* Geometry correction

>6 months:* Bio-engineering
* Road Water Management plan
* Upgrading earthen drain
* Cross drainage structure
* Recharge ponds
* Upgrading road surface
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**Table 3**: Group 3 - Can we think of a large program to systematically introduce good practice the road water harvesting and bio-engineering in certain road sections (how, where)? What are the things to do in the next 3-6 month?

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| **Good Practices in Tikabhairav-Bagmati Road Section of Kanti Lokpath (45 Km)** |
| Bio-Engineering | Remarks |
| What we will do? | Bamboo crib-wall, wattle, fascines, palisades, brush layering, grass plantation, jute netting, surface & Subsurface drainage management | Depending upon the site inspection |
| What we want to achieve? | Slope stabilization, Water management & Sustainable traffic flow |  |
| Who will do what? | Research institutions: Academic and Private Research engaged for the site specific solutionsDoR: Contract management and Implementation | Pubic consultation and participation during implementation |
| What is the role of government? | Supervision, Facilitation, Monitoring and Evaluation |  |
| Timing of activities? | Planning: 3 months Site preparation & Implementation: 3 months (Pre and Monsoon season)Management and Maintenance: year round  |  |
| Water Recharge ponds | Remarks |
| What we will do? | Construction of small scale water recharge ponds in plane areaRehabilitation of older pond (if any) | Research (geological) prior to site selection |
| What we want to achieve? | Ground water recharge |  |
| Who Will do what? | Research institutions: Academic and Private Research engaged for the site specific solutionsDoR: Contract management and Implementation | Pubic consultation and participation during implementation |
| What is the role of government? | Supervision, Facilitation, Monitoring and Evaluation |  |
| Timing of activities? | Construction of recharge ponds: Pre monsoon seasonManagement of ponds: monsoon season |  |
| Small scale watermills & HEP | Remarks |
| What we will do? | Construction of small scale water mills at cross drainage sites | Depending upon the site inspection |
| What we want to achieve? | Tapping waste water potential (Waste to energy) |  |
| Who Will do what? | Research institutions: Academic and Private Research engaged for the site specific solutionsDoR: Co-ordination with localsPublic: Participation and involvement (Ownership) | Strong Role and commitment of Locals |
| What is the role of government? | Facilitation |  |
| Timing of activities? | Planning and construction: Pre-monsoon seasonOperation: During monsoon and Post Monsoon  | Post Monsoon (Depending upon water availability) |