

**INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE**  
**DEPARTMENTAL REVIEW TEMPLATE**

1. Name of Department/Center : WATER RESOURCES DEVELOPMENT AND MANAGEMENT

2. Reviewers :

- (i) Er. M. Gopalakrishnan, FNAE  
Secretary General (Hon.), ICID & Former Member CWC & Additional Ex. Official Secretary, MoWR, New Delhi
- (ii) Dr. N.K. Tyagi,  
Ex-Director, Central Soil Salinity Research Institute (CSSRI), Karnal
- (iii) Er. R.C. Jha  
Retd. Chairman, CWC

3. Dates of Review: 19-20.03.2014

**GRID FOR ASSESSMENT**

**NOTE:**

- i. Please grade in the box provided for the following parameters in the range of 1-10 with 10 being the highest.
- ii. Leave 'blank' for 'No Comment'.
- iii. Kindly give your opinion on the strength and weakness of the Department/ Center and your suggestions for future growth.

**I. ACADEMICS**

I.1	Undergraduate	Score
1.	Curriculum i. Curricular Structure ii. Course Syllabi iii. Flexibility	Not
2.	Formal Academic Load on Students i. Teaching ii. Laboratory/Practical iii. Projects(minor/major)	Applicable since The Dept. does
3.	Evaluation Process i. Continuing Evaluation ii. Mid-term Evaluation	not handle UG courses

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	iii. End-term Evaluation		
4.	Academic Ambience	}	
5.	Opportunity for Peer-Based Learning		
6.	Opportunity for Further Learning(Breadth and Depth) i. Elective Courses Specialization ii. Minor with Major Discipline iii. Honors Programme in Major Discipline		Not
7.	E-Assisted Learning i. Availability of Library Resources and Major Search Engines (like Scopus, Web of Science) ii. Multi-Media Assisted Teaching		Applicable since
8.	In -Curriculum Research/Exploration Opportunity to Students		the
9.	Technical Societies/ Colloquium for Students i. Departmental Society ii. Student Chapter(s) of Professional Societies		Dept.
10.	Faculty -Student Interaction		
11.	Faculty Mentoring of Students		
12.	Faculty Advisor System for Students/Class of Students		
13.	Self Study Courses for Student		
14.	Effective Teaching Mechanism for Enhanced Number of Students in Various Classes		
15.	Effectiveness of Assisted Learning: Tutorial System for B.Tech Students/ Seminars		

I.2	Graduate Programmes (Masters)	Score
1.	Curriculum i. Curricular Structure ii. Course Syllabi iii. Flexibility (Pages) and Irrigation Water Management (Page 21), as per Information Brochure	9 <i>The two streams in Main are Water Resources Development &amp; Irrigation Water Management</i>
2.	Formal Academic Load on Students i. Teaching ii. Laboratory/Practical iii. Seminar/Dissertation	7 <i>These are substantial to encompass holistically all relevant aspect Needs more attention</i>
3.	Evaluation Process i. Continuing Evaluation ii. Mid-Term Evaluation iii. End-Term Evaluation	9 <i>Tutorials &amp; Practical - Semester Exams</i>
4.	Academic Ambience	10 <i>(located amidst best enviroing conducive to pursue WRD &amp; IWM)</i>
5.	Opportunity for Peer-Based Learning	9
6.	Opportunity for further Learning(Breadth and Depth) Elective Courses (Specialization Electives)	10 <i>wider choice</i>
7.	E-Assisted Learning i. Availability of Library Resources and Major Search Engines	9 <i>&amp; Good Library inhouse &amp; in IIT</i>

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	(like Scopus, Web of Science) ii. Multi-Media Assisted Teaching	{ available at both Dept and Institute level - fair enough }	
8.	In -Curriculum Research/Exploration Opportunity to Students		9
9.	Technical Societies/ Colloquium for Students		
	i. Departmental Society	5 IWRs base	8
	ii. Student Chapter(s) of Professional Societies	3	
10.	Faculty -Student Interaction		10
11.	Faculty Mentoring/Supervising of Students		9
12.	Faculty Advisor System for Students/Class of Students	one to one basis	9
13.	Effectiveness of Assisted Learning: Home Assignments/Seminars/Presentations		9

I.3	Doctoral (Ph.D) Programmes	Score
1.	Pre-Ph.D Courses and Evaluation Process	8
2.	Comprehensive Courses Examination	9
3.	Breadth and Depth of Knowledge of Students	8
4.	Seminar/ Presentations and Technical Communication	7
5.	Average No. of Research Students/Faculty	9
6.	Average No. of Research Papers of Ph.D Students	7
7.	Average Duration to Complete Ph.D (years)	7 <del>5.5</del>

**II. RESEARCH**

		Score
1.	Research Ambience in the Department	9
2.	Research Awareness among Doctoral Students	8
3.	Competence Level of Doctoral Students for Research	8
4.	Quality of Research	9
5.	Quality of Publications	7
6.	Impact of Publications	7
7.	Relevance of Research to Knowledge Generation	8
8.	Societal Relevance of Research	10
9.	Exposure of Researchers to the International State of Art	8
10.	Student Exposure to Attending Quality Conferences/Symposia	7
11.	Growth in Ph.D Programme	7
12.	Quality of Research Infrastructure	8
13.	Utilization of Existing Research Infrastructure	9
14.	Department Initiative on Faculty Hiring	8
15.	Breadth and Depth of Research in the Department	9
16.	Research Intensity of Faculty Members	9

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**Futuristic Areas For Hiring Faculty Members** ( these can be in modules - ranging from 5 - 10 days )  
 Design Experts in Gravity Dams, Trapezoidal Dams, Geomembrance Use in water Sector etc.

**Research Areas for Improvement** Holistic Water Resources Planning Aspects utilizing the approaches advanced in World Water Development Reports

**Comments (not more than 100 words for each given below)** and looking at country / State Scenarios, by researchers

**Strength:** conducting environ & ambiente since the settings in Roorkh provides ample opportunities for Researchers to interact with experts meaningfully (which'll be rewarding)

**Weakness:** Creating a ( NIT, UP ID designs & Hydraulic Research Lab ) sufficient & enabling circumstances ask for support in procurement of the research scholars' specific needs (equipment / consumables) etc

**Suggestions for improvement:** Sharing the facilities in IITR in other Departments, etc

Facilities Enhancement ( land for experimental farms, equipment, sophisticated equipments for monitoring etc in r/o irrigation research, Hydraulic & Sediment Modelling; Eco-sensitive Research etc

**III. Departmental Infrastructure**

	Score
1. Adequacy of Class Rooms and Multi-Media Facility	10
2. Availability of Laboratories	9
3. Availability of Conference/Seminar Room, etc.	10
4. Availability of Seating Space for Research Students	9
5. Availability of Internet Services in Research Labs and Class Rooms	9
6. Departmental Library and E-Resources	9
7. Computing Facilities and Software	9
8. Adequacy of Offices and Furnishing for Faculty	9
9. Faculty- Student Ratio	9
10. Support Staff (Technical/Administrative) Adequacy	9

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Comments (not more than 100 words for each given below)

**Strength:** The unique privilege of the dept. lies in its ability to <sup>enhance</sup> ~~make~~ IIT(R)'s visibility globally - as it has, to its credit, over trainees who utilized the facilities in IIT(R) to strengthen their academic capability to face real world challenges. (Other Institutions

**Weakness:** comparable to this in water sector is only in developed world (UNESCO- IHE) Netherlands. Their Graduates in the recent past have held very high positions in International and National Organisations.

**Suggestions for improvement:**  
 Introduction of latest trends in Planning and Management  
 Bringing into the curricula, the state of the art techniques like  
 - Dam Safety Assurance, Irrigation water Management 'Trapezoidal dams'  
 Agricultural Drainage Management etc

**IV. Admissions of Ph.D Students**

		Score
1.	Intake of Ph.D Students	8
2.	Admission Process	9

**Suggestions:**

All efforts to encourage aspirants for Ph D in the Water Resources development and management should deserve a priority action. Last, non-engineering professionals fill in the vacuum; and, <sup>the</sup> sectoral management suffers in the process since 'engineering aspects' stand relegated in status.

## V. Outcomes

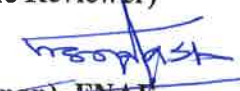
		Score
1.	Placements i. Placement of B.Tech/IDD Students ii. Placement of Masters Student (Gate entrants) iii. Placement of Ph.D Students	Not applicable Excellent 8
2.	Average No. of Ph.D.s Awarded per Year (3 to 4)	7
3.	Publications per Faculty in ISI Indexed Journals/Year	5
4.	Average Citations per Faculty/Year (Last-Three Years) (Web of Science/Scopus)	5
5.	Recognitions; Awards(National/International) to Faculty/Students	5
6.	Consultancy and Projects	7
7.	No. of Ph.D. graduates who took Academics as Career(Based on Data of Last 5 Years)	

**Comments and Suggestions for improvement:** Water is moving up as a key issue in regard to Human development and GDP. Given the increasing stress in water availability for ever growing population, innovative solutions are being demanded for addressing water challenges. Agricultural Water Management, Asset Management of Infrastructure (Dams, Canals etc) seek new modules to be brought into the curriculum. Integrated Planning Approach (using Systems Analysis), Multi Sectoral impact assessment for ensuring Sustainable Development, Eco-system approach to ensure sustainable solutions are a few such areas, WRD&M should be allowed to dovetail substantial practical modules (instead of theoretical) which is possible by field visits for Graduate Trainees & Project Report Preparation etc. The time slotted for Dissertation (one year) can be reviewed to include these ideas.

Date: 20.03.2014

Borrowing external expertise from scholars inside & outside (Guest lectures etc) might provide Faculty Strength Augmentation, both in quality & quantity.

(Signature of the Reviewer)

  
(Er. M. Gopalakrishnan), FNAE  
Secretary General (Hon.), ICID &  
Former Member CWC & Additional Ex. Official Secretary,  
Ministry of Water Resources,  
D-1/12, Janakpuri, New Delhi-110 058.  
e-mail: mgopalakrishnan@hotmail.com;  
mgopalakrishnan\_in@yahoo.com

**INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE**

**DEPARTMENTAL REVIEW TEMPLATE**

1. Name of Department/Center : **WATER RESOURCES DEVELOPMENT AND MANAGEMENT**

2. Reviewers :

- (i) Er. M. Gopalakrishnan, FNAE  
Secretary General (Hon.), ICID & Former Member CWC
- (ii) Dr. N.K. Tyagi  
(Ex-Director, Central Soil Salinity Research Institute (CSSRI), Karnal); 101/A5, Olive Country, Sector-5, GH-09, Vasundhara, Ghaziabad 201012, U.P.
- (iii) Er. R.C. Jha  
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3. Dates of Review: 19-20.03.2014

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- i. Please grade in the box provided for the following parameters in the range of 1-10 with 10 being the highest.
- ii. Leave 'blank' for 'No Comment'.
- iii. Kindly give your opinion on the strength and weakness of the Department/ Center and your suggestions for future growth.

**I. ACADEMICS**

I.1	Undergraduate	Score
1.	Curriculum i. Curricular Structure ii. Course Syllabi iii. Flexibility	<i>Not applicable</i>
2.	Formal Academic Load on Students i. Teaching ii. Laboratory/Practical iii. Projects(minor/major)	
3.	Evaluation Process i. Continuing Evaluation ii. Mid-term Evaluation	

*N. Tyagi*

	iii. End-term Evaluation	
4.	Academic Ambience	
5.	Opportunity for Peer-Based Learning	
6.	Opportunity for Further Learning(Breadth and Depth) <ul style="list-style-type: none"> <li>i. Elective Courses Specialization</li> <li>ii. Minor with Major Discipline</li> <li>iii. Honors Programme in Major Discipline</li> </ul>	
7.	E-Assisted Learning <ul style="list-style-type: none"> <li>i. Availability of Library Resources and Major Search Engines (like Scopus, Web of Science)</li> <li>ii. Multi-Media Assisted Teaching</li> </ul>	
8.	In –Curriculum Research/Exploration Opportunity to Students	
9.	Technical Societies/ Colloquium for Students <ul style="list-style-type: none"> <li>i. Departmental Society</li> <li>ii. Student Chapter(s) of Professional Societies</li> </ul>	
10.	Faculty –Student Interaction	
11.	Faculty Mentoring of Students	
12.	Faculty Advisor System for Students/Class of Students	
13.	Self Study Courses for Student	
14.	Effective Teaching Mechanism for Enhanced Number of Students in Various Classes	
15.	Effectiveness of Assisted Learning: Tutorial System for B.Tech Students/ Seminars	

I.2	Graduate Programmes (Masters)	Score
1.	Curriculum <ul style="list-style-type: none"> <li>i. Curricular Structure</li> <li>ii. Course Syllabi</li> <li>iii. Flexibility</li> </ul>	<p><i>There is need to utilize Ag. drainage in IWM prog. At present there are no such courses offered</i></p> <p><i>Shortage of faculty reduces flexibility</i></p> <p>A-1</p> <p>B+</p>
2.	Formal Academic Load on Students <ul style="list-style-type: none"> <li>i. Teaching</li> <li>ii. Laboratory/Practical</li> <li>iii. Seminar/Dissertation</li> </ul>	Adequate
3.	Evaluation Process <ul style="list-style-type: none"> <li>i. Continuing Evaluation</li> <li>ii. Mid-Term Evaluation</li> <li>iii. End-Term Evaluation</li> </ul>	A-1 A A
4.	Academic Ambience	Very good
5.	Opportunity for Peer-Based Learning	Very good
6.	Opportunity for further Learning(Breadth and Depth) Elective Courses (Specialization Electives)	<i>Shortage of faculty in some Dept. curricula</i>
7.	E-Assisted Learning <ul style="list-style-type: none"> <li>i. Availability of Library Resources and Major Search Engines</li> </ul>	Very Good



	(like Scopus, Web of Science) ii. Multi-Media Assisted Teaching	
8.	In –Curriculum Research/Exploration Opportunity to Students	Adequate
9.	Technical Societies/ Colloquium for Students i. Departmental Society ii. Student Chapter(s) of Professional Societies	Excellent
10.	Faculty –Student Interaction	Excellent
11.	Faculty Mentoring/Supervising of Students	Very good
12.	Faculty Advisor System for Students/Class of Students	Very good
13.	Effectiveness of Assisted Learning: Home Assignments/Seminars/Presentations	Very good

I.3	Doctoral (Ph.D) Programmes	Score
1.	Pre-Ph.D Courses and Evaluation Process	Adequate
2.	Comprehensive Courses Examination	Very good
3.	Breadth and Depth of Knowledge of Students	Not evaluated
4.	Seminar/ Presentations and Technical Communication	Very good
5.	Average No. of Research Students/Faculty - 3 / 21 showed <sup>course</sup>	A-1
6.	Average No. of Research Papers of Ph.D Students - 2	Adequate
7.	Average Duration to Complete Ph.D (years) 3.5	O.K.

## II. RESEARCH

		Score
1.	Research Ambience in the Department	Very good
2.	Research Awareness among Doctoral Students	B+
3.	Competence Level of Doctoral Students for Research	B+
4.	Quality of Research	B+
5.	Quality of Publications	B+
6.	Impact of Publications (The journals not mentioned are publications)	B+
7.	Relevance of Research to Knowledge Generation	B+
8.	Societal Relevance of Research	B+
9.	Exposure of Researchers to the International State of Art	Need improvement
10.	Student Exposure to Attending Quality Conferences/Symposia	Scope for improvement
11.	Growth in Ph.D Programme	V. Good
12.	Quality of Research Infrastructure	Very good
13.	Utilization of Existing Research Infrastructure	Partially good
14.	Department Initiative on Faculty Hiring	Need to improve
15.	Breadth and Depth of Research in the Department	Very good
16.	Research Intensity of Faculty Members	Very good

**Futuristic Areas For Hiring Faculty Members**

- ①. Agricultural Land Drainage
- ②. Water Quality
- ③. Economics

**Research Areas for Improvement**

Comments (not more than 100 words for each given below)

**Strength:** Good faculty in core areas, reasonably good in presence of NIH, Hydrology and other institutions

**Weakness:** The focus should be development oriented projects leading to useful output / outcome

**Suggestions for improvement:**

W R O M mandate is somewhat different from other academic departments. The orientation / direction of research should be more field oriented. The interaction with line departments in the field (Immigration, Forest / Agriculture, Ground water etc) should be enhanced

**III. Departmental Infrastructure**

		Score
1.	Adequacy of Class Rooms and Multi-Media Facility	Good
2.	Availability of Laboratories	BT Space avail. after
3.	Availability of Conference/Seminar Room, etc.	V. Good
4.	Availability of Seating Space for Research Students	V. Good
5.	Availability of Internet Services in Research Labs and Class Rooms	V. Good
6.	Departmental Library and E-Resources	It is in the process of development
7.	Computing Facilities and Software	A-1
8.	Adequacy of Offices and Furnishing for Faculty	A
9.	Faculty- Student Ratio	1:11
10.	Support Staff (Technical/Administrative) Adequacy	should improve for A-1 rating. - Needs strengthening

*Signature*

Comments (not more than 100 words for each given below)

Strength:

- 1) The class rooms, seminar hall, computers are available in sufficient quantity
- 2) Part of the needs can be met from other department

Weakness:

- 1) Interaction with Research scholars indicated that software support/desegated train & technical staff for sophisticated software is back up.
- 2) Research farm is inadequate

Suggestions for improvement:

- ①. The Department should acquire atleast a share server farm for IWM
- ②. The priceless old reports should be microfimed.
- ③. The research labs needs more support in terms of precision equipments.

IV. Admissions of Ph.D Students

		Score
1.	Intake of Ph.D Students	B
2.	Admission Process	A <sup>-1</sup>

Suggestions:

The number of Ph.D. scholars appears to be less. The average turn out of Ph. D. scholars/year/faculty is about ①. This needs to get up to about ②/year/faculty.

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V. Outcomes

		Score
1.	Placements i. Placement of B.Tech/IDD Students ii. Placement of Masters Student iii. Placement of Ph.D Students	Not applicable
2.	Average No. of Ph.D.s Awarded per Year	6 B+
3.	Publications per Faculty in ISI Indexed Journals/Year	7 B
4.	Average Citations per Faculty/Year (Last-Three Years) (Web of Science/Scopus)	3
5.	Recognitions; Awards(National/International) to Faculty/Students	B+
6.	Consultancy and Projects	Rationalization is needed V. Good
7.	No. of Ph.D. graduates who took Academics as Career(Based on Data of Last 5 Years)	31 V. Good

**Comments and Suggestions for improvement:**

The Department gets M.Tech. students through GATE / In-service sponsorship / direct.

There is a problem for GATE candidates as there is no placement service at present exists. Like the service of placement for B.Tech. student., the M.Tech. (GATE) candidates should also be extended this service.

Date: 20.03.2014

  
(Signature of the Reviewer)

(Dr. N.K. Tyagi)  
(Ex-Director, Central Soil Salinity Research Institute (CSSRI), Karnal)  
101/A5, Olive Country, Sector-5, GH-09,  
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Email: nktyagi1947@gmail.com



**INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE**

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✓ (iii) **Er. R.C. Jha (Retd. Chairman, CWC)**  
**D-121, First Floor, Sector-8 Dwarka, New Delhi-110075**

**3. Dates of Review: 19-20.03.2014**

**GRID FOR ASSESSMENT**

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- ii. Leave 'blank' for 'No Comment'.
- iii. Kindly give your opinion on the strength and weakness of the Department/ Center and your suggestions for future growth.

**I. ACADEMICS**

<b>I.1</b>	<b>Undergraduate</b>	<b>Score</b>
1.	Curriculum i. Curricular Structure ii. Course Syllabi iii. Flexibility	NA
2.	Formal Academic Load on Students i. Teaching ii. Laboratory/Practical iii. Projects(minor/major)	
3.	Evaluation Process i. Continuing Evaluation ii. Mid-term Evaluation	

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	iii. End-term Evaluation	
4.	Academic Ambience	
5.	Opportunity for Peer-Based Learning	
6.	Opportunity for Further Learning(Breadth and Depth) i. Elective Courses Specialization ii. Minor with Major Discipline iii. Honors Programme in Major Discipline	
7.	E-Assisted Learning i. Availability of Library Resources and Major Search Engines (like Scopus, Web of Science) ii. Multi-Media Assisted Teaching	
8.	In –Curriculum Research/Exploration Opportunity to Students	
9.	Technical Societies/ Colloquium for Students i. Departmental Society ii. Student Chapter(s) of Professional Societies	NA
10.	Faculty –Student Interaction	
11.	Faculty Mentoring of Students	
12.	Faculty Advisor System for Students/Class of Students	
13.	Self Study Courses for Student	
14.	Effective Teaching Mechanism for Enhanced Number of Students in Various Classes	
15.	Effectiveness of Assisted Learning: Tutorial System for B.Tech Students/ Seminars	

I.2	Graduate Programmes (Masters)	Score
1.	Curriculum i. Curricular Structure ii. Course Syllabi iii. Flexibility	9 9 9
2.	Formal Academic Load on Students i. Teaching ii. Laboratory/Practical iii. Seminar/Dissertation	9 8 8
3.	Evaluation Process i. Continuing Evaluation (Through tutorials/practicals) ii. Mid-Term Evaluation (Mid-term examination) iii. End-Term Evaluation (End of each semester)	9 9 9
4.	Academic Ambience	10
5.	Opportunity for Peer-Based Learning (Workshop, seminar, etc)	9
6.	Opportunity for further Learning(Breadth and Depth) Elective Courses (Specialization Electives)	8
7.	E-Assisted Learning i. Availability of Library Resources and Major Search Engines	8

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	(like Scopus, Web of Science) ii. Multi-Media Assisted Teaching	9
8.	In –Curriculum Research/Exploration Opportunity to Students	9
9.	Technical Societies/ Colloquium for Students i. Departmental Society ii. Student Chapter(s) of Professional Societies	9 9
10.	Faculty –Student Interaction (daily basis)	9
11.	Faculty Mentoring/Supervising of Students	9
12.	Faculty Advisor System for Students/Class of Students	9
13.	Effectiveness of Assisted Learning: Home Assignments/Seminars/Presentations	9

I.3	Doctoral (Ph.D) Programmes	Score
1.	Pre-Ph.D Courses and Evaluation Process	8
2.	Comprehensive Courses Examination	9
3.	Breadth and Depth of Knowledge of Students	8
4.	Seminar/ Presentations and Technical Communication	9
5.	Average No. of Research Students/Faculty (3)	8
6.	Average No. of Research Papers of Ph.D Students (2)	9
7.	Average Duration to Complete Ph.D (years) (3.5)	8

## II. RESEARCH

		Score
1.	Research Ambience in the Department	9
2.	Research Awareness among Doctoral Students	8
3.	Competence Level of Doctoral Students for Research	8
4.	Quality of Research	8
5.	Quality of Publications	8
6.	Impact of Publications	8
7.	Relevance of Research to Knowledge Generation	8
8.	Societal Relevance of Research	8
9.	Exposure of Researchers to the International State of Art	8
10.	Student Exposure to Attending Quality Conferences/Symposia	9
11.	Growth in Ph.D Programme (4 in 2008 to 8 in 2013)	9
12.	Quality of Research Infrastructure	8
13.	Utilization of Existing Research Infrastructure	9
14.	Department Initiative on Faculty Hiring	7
15.	Breadth and Depth of Research in the Department	8
16.	Research Intensity of Faculty Members	9

**Futuristic Areas For Hiring Faculty Members**

- i. Invited/Guest Faculty in the area of structural designs, elective subjects, project management.

**Research Areas for Improvement**

Comments (not more than 100 words for each given below)

**Strength:** Availability of modern equipment, rich library, e-resources, very competent faculty, linkage with well known institutes and right ambience.

**Weakness:** Lack of support for procurement of new equipments, consumables, etc, procedural difficulties in data collection, field visits, utilization of facilities in other departments, etc.

**Suggestions for improvement:**

Creation of a dedicated fund for support for research and simplification of norms and procedure to remove bottlenecks being faced.

**III. Departmental Infrastructure**

		Score
1.	Adequacy of Class Rooms and Multi-Media Facility	10
2.	Availability of Laboratories	9
3.	Availability of Conference/Seminar Room, etc.	10
4.	Availability of Seating Space for Research Students	9
5.	Availability of Internet Services in Research Labs and Class Rooms	10
6.	Departmental Library and E-Resources	10
7.	Computing Facilities and Software	9
8.	Adequacy of Offices and Furnishing for Faculty	10
9.	Faculty- Student Ratio (1:14)	9
10.	Support Staff (Technical/Administrative) Adequacy (more staff needed)	7

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## V. Outcomes

		Score
1.	Placements i. Placement of B.Tech/IDD Students ii. Placement of Masters Student iii. Placement of Ph.D Students	NA 8 8
2.	Average No. of Ph.D.s Awarded per Year (6-9)	10
3.	Publications per Faculty in ISI Indexed Journals/Year (Av-7)	10
4.	Average Citations per Faculty/Year (Last-Three Years) (Web of Science/Scopus) - (47/65)	10
5.	Recognitions; Awards(National/International) to Faculty/Students	9
6.	Consultancy and Projects	9
7.	No. of Ph.D. graduates who took Academics as Career(Based on Data of Last 5 Years) - (31)	10
<b>Comments and Suggestions for improvement:</b>  1. The level of above outcome is highly appreciated. 2. Due attention may be separately given for placement of Masters & Ph.D students. 3. Guest Faculties/Invited lectures should be arranged wherever deficiencies have been observed due to insufficient faculty.		

Date: 20.03.2014

  
(Signature of the Reviewer)

Er. R.C. Jha  
(Retd. Chairman, CWC)  
D-121, First Floor, Sector - 8  
Dwarka, New Delhi - 110075  
Email: rcjhacwc@yahoo.co.in

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DEPARTMENT OF WATER RESOURCES DEVELOPMENT AND MANAGEMENT  
INDIAN INSTITUTE OF TECHNOLOGY-ROORKEE

No.WR/Rev.Comm./371

Date: March 24, 2014

27

Dean of Faculty Affairs  
IIT Roorkee

Subject: Report of Review Committee

Please refer to your letter No. IITR/DOFA dated Feb. 13, 2014 (copy enclosed) vide which approval of Director, IITR of three Expert Members of Review Committee consisting of following eminent persons for the Department was conveyed.

1. Er. R.C. Jha, Retd. Chairman, CWC, D-121, First Floor, Sector – 8, Dwarka, New Delhi-110075
2. Dr. N.K. Tyagi, Ex-Director, Central Soil Salinity Research Institute, Karnal, 101/A5, Olive Country, Sector-5, GH-09, Vasundhara, Ghaziabad 201012, U.P.
3. Er. M. Gopalakarishnan, Ex Secretary General, International Commission on Irrigation & Drainage, ICID, New Delhi), DI/12, Janakpuri, New Delhi – 110058

The above three (3) Expert Members Committee visited the Department during March 19-20, 2014 to review the Department. During their stay the Expert Committee held meetings with all Faculty Members, Non-Teaching Staff, Post Graduate students and Research Scholars of the Department. They also visited all Laboratories of the Department and Research Farm at Toda Kalyanpur Village. The Report prepared by the Review Committee is being sent for further necessary action at your end. The soft copy of the same is also being sent.

Encl: As above.

  
(Deepak Khare)  
Professor & Head

OFFICE OF DEAN OF FACULTY AFFAIRS  
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

No. IITR/DOFA/

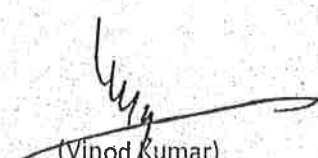
Dated: 13<sup>th</sup> February 2014

Prof. & Head  
WRD&M

The Director has approved the following names for the review of your Department. You are requested to contact them and send a copy of the report prepared by your Department for their comments & observations. You are also requested to plan a visit of the committee to your Department for further discussions with the faculty. It is requested that a meeting of the committee with DOFA and the Director be arranged during the visit of the committee and before finalizing the report. Please keep me in the loop and send a copy of the report to DOFA office also.

It is requested that the review process be completed by 15<sup>th</sup> March 2014.

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(Vinod Kumar)  
Dean of Faculty Affairs

Date 20<sup>th</sup> March, 2014

To

The Director  
Indian Institute of Technology  
Roorkee

**Subject: Review report of Water Resources Development and Management Department**

Dear Sir,

At the outset, we are grateful to the Institute for imposing faith in us to review the working of Water Resources Development and Management Department. The Committee had been provided with a status report in the prescribed metrics format which was supplemented by a presentation by the Head of Department. The committee is highly impressed with the documentation provided which is quite comprehensive.

The review started with the departmental presentation followed by interaction with faculty. Exclusive group meetings were also held subsequently with Post Graduate students and Ph.D scholars besides technical, academic & administration staff.

The Committee visited research laboratories maintained in the Department as a part of the review exercise; this included a visit to Field Agricultural Research Farm on a rented land at Toda Kalayanpur village.

The review exercise of the team commenced on 19<sup>th</sup> and spilled over to 20<sup>th</sup> March 2014.

The Committee members are pleased to submit their independent evaluation which are attached as Annexure – A.

**Our common findings are briefly brought out as under:**

The setting under which the Department evolved has certain uniqueness and is of now, nearly sixty years old. The initial vision was to help the process of water resources development to enhance India's capability to be self sufficient in water, food and energy. There was a necessity to have a regional Institute or Centre, that could cope up with the need for structured development and management of water resources and this was not restricted to the country but extended to the whole of Asia and Africa. The settings in 1950s was such as to provide a lead position for the country to participate in the capacity building in the region, and this also extended to Africa. The WR D&M Department, formerly WRDTC in University of Roorkee, got established in 1955 with the primary mission to fulfil the needs for the 'capacity building' in the development of water resources and its management.

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The Department has a good recognition for capacity building in the area of WRD&M ; several alumni of this department have held the highest position in their respective Governments in the Centre and Indian States in shaping the country's future with their specialised knowledge acquired in the WRD&M of IIT R. Not only in India, there were quite a few who had also held positions of leadership, in their own countries like Ethiopia, Kenya, Tanzania etc. That this could yield several ambassadors to promote the image of the Department and IIT R is apparent from the continuing interest in sponsoring officers/students who already serve in good positions in their own setting. They are identified to shape their further mission in water sector with a high level of knowledge acquisition through the Master's and higher level academic programmes. Statistics indicate that the human resource development through the department is 2579 persons and about 40% of them were from abroad in developing countries of the third world. Obviously the impact is the proud privilege process in participating in societal welfare by the Institute. There is an equal gain as the officers from other countries sponsored for training bring with them their own expertise. This provides a mutually beneficial setting for Indian students viz-a-viz foreign students.

The challenges posing the world in respect of water are enormous with the increasing population and water demands and the need for an efficient water management in ever dwindling resource base (water, land and soil). The need for building up competent engineers who can ably handle the tasks ahead requires a constant review in the capacity building exercise. This asks for competent and sufficient faculty in Institutions that impart graduate programmes in water sector. Orienting the current programmes to tailor to the emerging needs based on ever changing circumstances (PG, M Tech and Ph.D) would make it attractive for not only Indians but also the trainees from outside the country. WRD&M had already gained a niche internationally as a competent one with the wherewithal to contribute. This needs to be sustained and if possible (which is feasible in our view) strengthened.

Notwithstanding the tight academic schedule for the course works (as it obtains now that match the IIT `system requirements for award of PG Dip., M.Tech, Ph.D etc) , we feel that field visits and project work (that used to be part of the curricula), might be useful to attract students from third world countries. This would yield in enhancing the overall competence of the graduates in handling water related issues. New areas to be taken on board. While climate change impacts are in the fore, students have to be trained to understand and appreciate environmental and social issues related to water resources development & management.

The need to equip the students / trainees in WRD/IWM on related water sector issues holistically calls for new modules such as

1. Integrated / Sustainable Management of Water Resources,
2. Sustainable Energy Systems,
3. Precision Irrigation Systems,
4. Water and Environment

The physical requirements as well as financial needs to achieve the new research challenge can be mobilised, given the growing importance for water issues and the emphasis of concerned Ministries (like HRD, Water Resources, Urban Development) in this regard. A substantial inherent strength in the Department to address challenges in new areas exist in the department. With some additional support, it can grow impressively. The needs, strengthening and exploring all options in this regard (part time involvement of experts from outside for imparting special lectures etc) is worthwhile. The course could be made a highly attractive one to satisfy the future water challenge in this manner.

The faculty of WRD&M is by and large doing an excellent teaching/ research and specific services in the areas of their specializations. The decision to initiate a master programme in IWM was in the right direction looking at the vast investment made in asset creation. But one has to move on to face additional challenges.

The faculty is able to secure reasonable funding support through consultancy and research projects. There is a scope for further augmentation. However, there is a need of rationalizing the consultancy projects. The WRD&M may be encouraged to take consultancy which require bringing home the available knowledge elsewhere. This would also enhance its outreach programme particularly with respect of facilitation to M. Tech and PH.D scholars in the WRD&M.

*Strengthening of the Technical / Administrative staff:*

- a) To implement the teaching and research programmes the need for trained technical and administrative staff cannot be over emphasized. There is a need to increase the strength also. Besides, there is a need for capacity building in them by scoping opportunities for upgrading their skills through training / refresher courses.
- b) The Department is running programmes in WRD and IWM which cater to the needs of irrigation management sector in the country and abroad. It is recommended that the Institute acquires an area of 5 to 10 Hectare of agricultural land nearby.

**Acknowledgment**

We acknowledge all concerned in facilitating our exercise and providing excellent stay facilities.

Yours Sincerely



**Er. R.C. Jha**  
Former Chairman, CWC



**Er. M. Gopalakarishnan**  
Secretary General Hon., ICID



**Dr. N. K. Tyagi**  
Former Director, CSSRI, Karnal