# Package 'warabandi'

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**Type** Package

**Title** Roster Generation of Turn for Weekdays:'warabandi'

**Version** 0.1.0

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**Description** It generates the roster of turn for an outlet which is flowing (water) 24X7 or 168 hours towards the area under command or agricutural area (to be irrigated). The area under command is differentially owned by different individual farmers. The Outlet runs for free of cost to irrigate the area under command 24X7.
So, flow time of the outlet has to be divided based on an area owned by an individual farmer and the location of his land or farm. This roster is known as 'warabandi' and its generation in agriculture practices is a very tedious task. Calculations of time in microseconds are more error-prone, especially whenever it is performed by hands. That division of flow time for an individual farmer can be calculated by 'warabandi'. However, it generates a full publishable report for an outlet and all the farmers who have farms subjected to be irrigated.
It reduces error risk and makes a more reproducible roster. For more details about warabandi system you can found elsewhere in Bandaragoda DJ(1995) <https://publications.iwmi.org/pdf/H_17571i.pdf>.

**License** GPL-3

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.1.1

**Imports** lubridate, utils, readtext, flextable

**Suggests** knitr, rmarkdown

**VignetteBuilder** knitr

**Depends** R (>= 2.10)

**NeedsCompilation** no

**Repository** CRAN

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# Contents



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`finalReport` *Warabandi data for generate after making for calculation*

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## Description

Warabandi data for generate after making for calculation

## Usage

```
data(finalReport)
```

## Format

It comprises all data required to mention in the final report

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`warabandi` *Warabandi*

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## Description

To generate a roster for a week (168 hrs. or 24X7) as used in warabandi system. Flow time of a watercourse to an individual farmer calculate based on their holding area (bigga or hectares), This flow time roster generated by this function known as "warabandi" in canal irrigated agricultural areas (Punjab, Rajasthan, Haryana and Some areas of Pakistan)

## Usage

```
warabandi(file, output = c(TRUE, FALSE), nof)
```

## Arguments

| | |
|---|---|
| `file` | = Contains data for calculation |
| `output` | = TRUE or FALSE to write output file |
| `nof` | = "My_report" specify output file name |

## Details

A regulated irrigation system, from source (reservoir or river) down to gate of farm known as 'nakka' known as warabandi. Water from reservoir or source is carried out by main canal which supplies sub-canal or sub-distributaries. Sub-distributaries run with full supply to secondary-sub-distributaries with rotations. These secondary-sub-distributaries supplies to watercourse through outlets. For water supply to different farms or fields situated along the web of watercourse by a time roster of week i.e., "Warabandi". Watercourse runs at full supply when secondary-sub-distributaries are in flow. This is 3° distributary system. The main objective of warabandi is to attain maximum efficiency of water use by implementing water scarcity on every user. Warabandi justifies equality and safe guards to every farmer even in the case of farm is located at the end of the watercourse. The roster of turn in the first we have to define various terminology used in warabandi;

Bharai:

When water start to fill-up the empty watercourse, time spent to fill the empty watercourse (length of the head to the farm gate i.e., Nakka) or we can say filling time or compensation to the farmer, known as 'bharai'.

Jharai:

When tail or end of the watercourse farmer has his turn and head or at the start of watercourse farmer diverted his shared water then rest of the flowed water will goes to the tail end farmer as compensation, i.e., empty time.

Rakva:

Culturable area owned by farmer or Area subjected to irrigation. Flow Time per unit area = It is a calculatable time by using following formula;

"168 hours - (Total bharai - Total jharai) / Total culturable command area".

Flow time for farmer<- It is a calculatable time by following formula;

(Flow time per unit area X Area owned by farmer) + (bharai for his field's gate location - jharai for his field's gate location)

Roster of turn

Basically, warabandi or roster of turn starts from Monday, 6:00 PM to next Monday, 6:00 PM throughout all week days. Time and date calculation can be done by "lubridate" R package, but it's not able to perform divide and multiplication tasks with numeric. In our knowledge there is no software or package to generate directly warabandi based on data available with "patwari". Data required to generate the warabandi can be found from related irrigation department officer known as "Patwari".

## Value

A list of different objects i.e. Flow Time per Unit Area, Total rakva, Total bharai, Total jharai, Full week Hours and Final report To generate final report saved output file has to be supplied into My_file.Rmd by editing it as per your need i.e. format of output document or headers and footers for the output table report.

## Note

Data structure: There should be at least 4 column containing header with; 1. Names of Farmer

2. Rakva: There can be multiple columns for this section but be sure header should be specified as (x.1, x.2, x.3.....x.N)

3. Bharai: This column should have data of compensation in the format of H:M (1:10). If there is no compensation to give a farmer then put it as '0:0'.

4. Jharai: This column should have data of Jharai in the same format as described in case of bharai. If there is no jharai to deduct from a farmer flow time then put it as '0:0'.

Input data should be in the ".txt" or ".csv" format. Which can be generated in in any data entry software like excel, libra etc. That's enough to calculate warabandi and it will generate full a week roaster as Output.csv. Output file will be saved in working directory

Required external packages: a) "lubridate" b) "readtext" d) "flextable" Or It can be said: Imports: lubridate readtext flextable

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## References

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3. V. Narain. Warabandi as a sociotechnical system for canal water allocation: opportunities and challenges for reform.Water Policy, 10(4):409â422, 2008

4. Ajmera S, Shrivastava RK. Water distribution schedule under warabandi system considering seepage losses for an irrigation project: A case study. Intl. J. Innov. Eng. Tech. 2013;2(4):178-87.

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`warabandi_data` *Warabandi data required for calculation*

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## Description

Warabandi data required for calculation

## Usage

```
data(warabandi_data)
```

## Format

It comprises name of farmer, Rakva, bharai, katai etc

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